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March 12, 2015

**Via Email**  
**Original via Mail**

British Columbia Utilities Commission  
Sixth Floor  
900 Howe Street  
Vancouver, B.C.  
V6Z 2N3

Attention: Ms. Erica M. Hamilton, Commission Secretary

Dear Ms. Hamilton:

**Re: FortisBC Energy Inc. (FEI)**

**Application for a Certificate of Public Convenience and Necessity (CPCN) for  
Approval of the Lower Mainland Intermediate Pressure (IP) System Upgrade  
(LMIPSU) Projects (the Application)**

**Response to the British Columbia Utilities Commission (BCUC or the  
Commission) Information Request (IR) No. 1**

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On December 19, 2014, FEI filed the Application referenced above. In accordance with Commission Order G-1-15 setting out the Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to BCUC IR No. 1.

If further information is required, please contact the undersigned.

Sincerely,

**FORTISBC ENERGY INC.**

***Original signed:***

Diane Roy

Attachments

cc (email only): Registered Parties



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1    **A.      PROJECT NEED AND JUSTIFICATION – COQUITLAM GATE**

2    **1.0      Reference:    Coquitlam Gate IP**

3                            **Exhibit B-1, Section 3.1.2.1, p. 26; Exhibit B-1-1, Appendix A-1, p. 9**

4                            **Project Justification - Leaks**

5                    The utility states on page 26 that the analysis by Dynamic Risk Assessment Systems  
6                    Inc. shows the probability of rupture of the NPS 20 pipeline is insignificant and the  
7                    probability of failure by leak will increase by a factor of 3.7 over the period 2013 to 2033.

8                    On page 5 of the Application, FEI explains that since 1987 the Coquitlam Gate pipeline  
9                    has experienced 15 leaks, seven of which occurred in 2013.

10                   1.1      Please provide a list of leaks on the NPS 20 Coquitlam Gate to 2nd and  
11                                      Woodland pipeline from 1987 through 2014 and the location, by kilometre post,  
12                                      of each leak. Please identify any leaks that were not due to external corrosion at  
13                                      girth welds, outline how each leak was repaired and provide an estimate of the  
14                                      quantity of gas released by each leak.

15  
16    **Response:**

17                   The table below contains the requested information. As FEI does not typically utilize kilometre  
18                   posts internally to reference IP pipelines, kilometre posts have been established for this  
19                   response through geospatial analysis with an estimated accuracy of +/- 10m.

20                   FEI has evaluated all recorded leaks between 1994 and 2014 on the NPS 20 Coquitlam Gate IP  
21                   pipeline as due to external corrosion under field applied coating at girth welds. Although there is  
22                   some uncertainty as to the cause of the 1987 leak, it is considered likely to have been due to  
23                   the same failure mechanism as subsequent leaks.

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1

Year	Date	Location - Description	Location - kilometre post	Cause of leak	Repair Method	Estimate of Lost Gas (m <sup>3</sup> )	Latitude	Longitude
1987	November 18, 1987	Springer Ave & Braelawn, Burnaby	12+950	<b>corrosion</b>	Not available	Not available	49.267366	-122.987429
1994	November 7, 1994	E. 2nd & Commercial Dr., Vancouver	19+550	<b>external corrosion</b> under field applied coating at girth weld	Weld Patch	Not available	49.268714	-123.069856
1999	August 18, 1999	3434 E. 2nd Ave, Vancouver	16+660	<b>external corrosion</b> under field applied coating at girth weld	Plidco Sleeve	Not available	49.268497	-123.030121
2001	February 1, 2001	Brentlawn Lane @ Fairlawn, Burnaby	14+070	<b>external corrosion</b> under field applied coating at girth weld	Weld Patch	Not available	49.269684	-123.000407
2010	February 18, 2010	Como Lake Ave 64 m west of Mariner Way, Coquitlam	0+120	<b>external corrosion</b> under field applied coating at girth weld	Weld Patch	Not available	49.263137	-122.818833
2011	March 18, 2011	7584 Broadway, Burnaby	9+330	<b>external corrosion</b> under field applied coating at girth weld	Cut Out	Not available	49.260895	-122.943102



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Year	Date	Location - Description	Location - kilometre post	Cause of leak	Repair Method	Estimate of Lost Gas (m <sup>3</sup> )	Latitude	Longitude
2012	May 24, 2012	2525 Como Lake Rd., Coquitlam	0+350	<b>external corrosion</b> under field applied coating at girth weld	Cut Out	1200	49.263155	-122.821781
2013	May 6, 2013	7578 Broadway, Burnaby	9+332	<b>external corrosion</b> under field applied coating at girth weld	Split Sleeve	1286	49.260895	-122.943102
	June 27, 2013	Halifax & Springer St., Burnaby	13+040	<b>external corrosion</b> under field applied coating at girth weld	Split Sleeve	2148	49.267963	-122.988061
	July 17, 2013	4100 Halifax St., Burnaby	15+300	<b>external corrosion</b> under field applied coating at girth weld	24" Casing	2356	49.268042	-123.012200
	August 8, 2013	4330 Blk Halifax St., Burnaby	14+980	<b>external corrosion</b> under field applied coating at girth weld	Weld Patch	734	49.268005	-123.007840
	August 20, 2013	4330 Halifax St., Burnaby	14+990	<b>external corrosion</b> under field applied coating at girth weld	24" Casing	587	49.267997	-123.008020



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Year	Date	Location - Description	Location - kilometre post	Cause of leak	Repair Method	Estimate of Lost Gas (m <sup>3</sup> )	Latitude	Longitude
	August 23, 2013	Como Lake Rd & Baker St., Coquitlam	0+560	<b>external corrosion</b> under field applied coating at girth weld	24" Casing	293	49.263164	-122.824689
	October 9, 2013	4100 Block Halifax St, Burnaby	15+250	<b>external corrosion</b> under field applied coating at girth weld	Weld Patch	661	49.268038	-123.011588
2014	March 4, 2014	Halifax St. & Gilmore Ave, Burnaby	15+540	<b>external corrosion</b> under field applied coating at girth weld	Split Sleeve	587	49.268064	-123.0140483

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1.1.1 Please clarify, of the leaks detected each year, what percentages of those leaks are confirmed to have occurred in that year?

**Response:**

FEI assumes that all of the leaks have occurred in the same year that they were detected. Given the odorant present in the natural gas, as well as the population density in the vicinity of the Coquitlam Gate IP pipeline, the Company considers this assumption to be reasonable.

The dates provided for each leak are the actual date the leak was positively identified as being on the Coquitlam Gate IP pipeline, rather than on a nearby distribution pipeline or service line.

1.1.2 On each occasion that a leak resulted in an outage to customers, please provide the numbers of each class of customer affected and the length of the outage.

**Response:**

On each occasion due to the failure severity, time of year, and location of failure, FEI has had sufficient maintenance flexibility to address past failures without unplanned outages to firm customers. However, in some cases, curtailment of interruptible customers has been used to facilitate repairs. In other instances, service to firm customers was maintained through the use of FEI mobile LNG tanker/vapourizer facilities.

The table below illustrates the actions taken to mitigate the outage risk during previous leak occurrences on the existing Coquitlam Gate IP pipeline.

Date	Location	Recorded Outages	Customer Class	Length of Outage	Mitigating Actions Taken
November 18, 1987	Springer Ave. & Braelawn Dr., Burnaby	Records not available			
November 7, 1994	E. 2 <sup>nd</sup> Ave. & Commercial Dr., Vancouver	Records not available			
August 18, 1999	3434 E. 2 <sup>nd</sup> Ave., Vancouver	Records not available			

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Date	Location	Recorded Outages	Customer Class	Length of Outage	Mitigating Actions Taken
February 1, 2001	Lane S of Brentlawn Dr. & Fairlawn Dr., Burnaby	Records not available			
February 18, 2010	Como Lake Ave. 64m west of Mariner Way, Coquitlam	1 (planned)	Class 22	1.5 days	<ul style="list-style-type: none"> <li>Customer was contacted in advance to confirm availability of alternate fuel source and to inform of potential curtailment</li> <li>Customer curtailed to maintain pipe operability while repairing leak</li> </ul>
March 18, 2011	7584 Broadway, Burnaby	None			<ul style="list-style-type: none"> <li>As the customer impacted was a “firm” customer, curtailment was not possible</li> <li>LNG support was provided for 2 days in order to maintain firm delivery to a Class 25 customer</li> </ul>
May 24, 2012	2525 Como Lake Rd, Coquitlam	1 (planned)	Class 22	2 days	<ul style="list-style-type: none"> <li>Customer was provided advance notice of potential curtailment</li> <li>Customer was curtailed to maintain pipe operability while repairing leak</li> </ul>
May 6, 2013	7578 Broadway, Burnaby	None			<ul style="list-style-type: none"> <li>As the customer impacted was a “firm” customer, curtailment was not possible</li> <li>LNG support was provided for 2 days in order to maintain firm delivery to a Class 25 customer</li> </ul>
June 27, 2013	Halifax St. & Springer St., Burnaby	None			
July 17, 2013	4100 Halifax St., Burnaby	None			



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Date	Location	Recorded Outages	Customer Class	Length of Outage	Mitigating Actions Taken
August 8, 2013	4330 Halifax St., Burnaby	None			
August 20, 2013	4330 Halifax St., Burnaby	None			
August 23, 2013	Como Lake Rd. & Baker St., Coquitlam	1 (planned)	Class 22	1 day	<ul style="list-style-type: none"> <li>Customer was curtailed to maintain pipe operability while repairing leak</li> </ul>
October 9, 2013	4100 block Halifax St., Burnaby	None			
March 4, 2014	Halifax St. & Gilmore Ave., Burnaby	None			

1.1.3 On each occasion when a leak caused a material safety concern, please describe the safety issue and how it was resolved.

**Response:**

Each of the leaks detected on the NPS 20 Coquitlam Gate IP pipeline is of concern to FEI, although FEI believes the safety risk is being mitigated appropriately through early leak detection and response. The main safety concern was that natural gas had the potential to migrate and accumulate in the surrounding areas, and if natural gas had accumulated to the point where the mixture of natural gas to air entered the range of 5%-15%, the potential for an explosion would exist. Actions taken by FEI to mitigate this safety concern included the monitoring of the NPS 20 Coquitlam Gate IP pipeline leaks on a 24-hour basis, ongoing venting/exhausting of the affected area, communications with nearby schools, businesses, and residents to raise awareness, and also the securing of excavation sites to protect the public, including traffic control and temporary fencing. It is through actively managing natural gas leaks that FEI is able to mitigate safety concerns along the NPS 20 Coquitlam Gate IP pipeline and ensure the continued safe and reliable delivery of natural gas to its customers.

As FEI is conducting regular leak surveys, it can be reasonably expected that leaks will be detected at an early stage. This minimizes, but does not eliminate, the potential for gas migration and accumulation that could result in material safety concerns. Past leak response records indicate one occurrence of natural gas inside a storm sewer, and one occurrence of

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1 natural gas mitigation into a nearby building. Gas accumulation in buildings or enclosed areas  
2 is a recognized hazard.

3  
4  
5  
6 1.1.4 On each occasion when a leak caused a material environmental  
7 concern, please describe the environmental issue and how it was  
8 resolved.  
9

10 **Response:**

11 FEI does not believe that any of the Coquitlam Gate IP pipeline leaks caused a material  
12 environmental concern. Estimates of the released gas are included in greenhouse gas  
13 reporting to the BC Ministry of Environment.

14 The above statement is consistent with FEI's response to BC Oil and Gas Commission (OGC)  
15 Order 2013-25, included as Appendix A-3 (Exhibit B-1-1), which concluded that the incremental  
16 environmental risk due to leaks on the Coquitlam Gate IP pipeline was not material.

17  
18  
19  
20 1.1.5 Please provide an explanation for the unusually high number of leaks  
21 on this system in 2013 and compare to the leaks observed in the  
22 previous five years.  
23

24 **Response:**

25 Corrosion rate can be influenced by a number of factors including, soil type, coating type and  
26 condition, ground water presence and rate of movement, temperature, presence of  
27 microbiological organisms, and other possible contributors such as aeration of the soil that could  
28 result from excavation activity of nearby utility operators.

29 Due to site-specific influences, each leak site would be expected to have an independent  
30 corrosion rate.

31 FEI review of the available data has not identified any factors other than the passage of time  
32 (such that corrosion rates resulted in "through-wall" penetration) that would have contributed to  
33 the higher number of leaks on the Coquitlam IP pipeline in 2013 versus the previous five years.

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As demonstrated by the Dynamic Risk Quantitative Reliability Assessment, included as Appendix A-1 (Exhibit B-1-1), it is expected that the number of corrosion failures will continue to increase over time. The number of 2013 leaks was estimated through this methodology to be 8.7, and the number of 2014 leaks was expected to be even higher. The methodology is considered to be statistically and methodologically sound.

FEI acknowledges that the actual number of recorded leaks in 2013 is higher than the leaks observed in 2010, 2011, 2012 and 2014; however, the incidence of leaks from one year to the next is subject to fluctuation that is characteristic of almost all physical processes. Please refer to the responses to BCUC IR 1.1.2 which describes the assessment methodology of the Dynamic Risk Quantitative Reliability Assessment and BCUC IR 1.2.1 for further discussion related to the confidence of the Dynamic Risk Quantitative Reliability Assessment.

1.1.6 Please describe the changes to leak survey frequency in 2013, and discuss whether this may have been a factor in the number of leaks identified.

**Response:**

As stated in FEI's response to the BC OGC Order 2013-25, included as Appendix A-3 (Exhibit B-1-1), FEI's standard leak survey frequency is annual for pipelines in Class 3 locations operating at pressures above 700 kPa.

Primarily in response to observed leak frequencies, FEI increased leak survey frequency of the Coquitlam Gate IP pipeline to quarterly on March 4, 2013 in order to locate leaks at the pinhole stage and to prevent growth of the any corrosion features and to mitigate the safety risk associated with gas migration. The Company further increased the leak survey frequency to weekly starting on August 22, 2013.

Although it is expected that weekly leak survey will identify leaks earlier than otherwise achieved through odour calls from the public or annual leak surveys, FEI considers it unlikely that a higher number of leaks has been identified as a result of more frequent survey.

1.1.7 Please provide an explanation for the way that the leaks appear to be clustered on certain sections of the pipeline.

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**Response:**

Similar local site conditions can result in similar corrosion rates which would explain the clustering of early leak occurrences.

However, based on FEI's past excavations and leak history, corrosion is occurring at girth welds along the entire length of the existing Coquitlam Gate IP pipeline. In addition, leaks have been recorded along the entire 20 km length of the pipeline. As such, given sufficient time, it is expected that future leaks will be distributed along the entire pipeline length.

Please also refer to the response to BCUC IR 1.1.1.5.

1.1.7.1 Please describe any assessments to evaluate differences in pipe metallurgy, manufacture or installation at the locations where clusters of leaks have occurred and provide the results of these assessments.

**Response:**

FEI conducted 18 excavations along the existing Coquitlam Gate IP pipeline between 2011 and 2013. Pipeline installation practice was assessed at the excavation locations through observations of coating condition, as this is considered the primary reason for the corrosion beneath field-applied coating at girth welds.

As discussed in FEI's Response to OGC General Order 2013-25, included as Appendix A-3 (Exhibit B-1-1), "this failure mechanism at the girth welds is considered prevalent along the entire length of the pipeline. 77% of girth welds examined since 2010 showed evidence of disbondment at the field-applied coating."

FEI has not completed any assessments to evaluate differences in pipe metallurgy or manufacture. It is not expected that any metallurgical variation that may exist in the pipe body would significantly impact corrosion rate. Industry has not recognized pipe manufacture as an influencing factor for the corrosion mechanism applicable to the NPS 20 Coquitlam Gate IP pipeline.

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1  
2 1.1.7.2 Please describe any assessments to evaluate soil conditions  
3 at the locations where clusters of leaks have occurred,  
4 including pH, water content or other factors, and provide the  
5 results of these assessments.  
6

7 **Response:**

8 At each of the leak locations in 2013 and 2014, FEI gathered information related to drainage,  
9 native soil type and pipe bedding. Ground water was present at each of these sites, and  
10 electrolyte was observed beneath the disbonded field-applied coating. These were the only  
11 common factors observed among the sites.

12 In addition to the leak site observations, data from excavations conducted in 2011, 2012 and  
13 2013 generally indicated that the corrosion rate beneath disbonded field-applied coating  
14 increased where the prevalence of ground water increased.

15 Detailed inspections conducted in 2011 and 2012 adjacent to the historical leak sites  
16 endeavored to collect the following soil components to assess the corrosivity of the environment  
17 and susceptibility of the pipeline to corrosion: dominant soil type, minor soil type, drainage at  
18 pipe depth, ground water presence, depth to groundwater, mode of soil deposition, presence of  
19 soil mottling, depth to mottling, presence of soil gleying, depth to gleying, estimated percent  
20 coarse fragments, estimated percent fine fragments, soil profile, and soil resistivity  
21 measurements.

22 FEI has utilized soil modeling for other pipeline systems; however, based on review of the  
23 detailed inspection data described above, FEI determined that soil modeling was not meaningful  
24 for the Coquitlam Gate IP pipeline due to its installation under roadways where soils and natural  
25 drainage channels have been modified. In addition, the pipeline corridor and other buried  
26 utilities which cross the pipeline can act as conduits for water.

27  
28  
29  
30 1.1.7.3 What steps has FEI taken or could it take to modify soil  
31 conditions so as to reduce corrosion rates at the locations  
32 where clusters of leaks have occurred?  
33

34 **Response:**

35 FEI does not believe it is practicable or cost-effective to modify the environment surrounding the  
36 pipeline in an attempt to influence corrosion rate. As discussed in the response to BCUC IR

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1.1.1.7.2, corrosion rate under disbonded coating appears to correlate to the presence of ground water. Ground water existence and migration are not considered controllable factors along the 20 kilometre length of the Coquitlam Gate IP pipeline.

1.1.8 Further to the statement on page 6 of Appendix A-1 that the pipeline has been modified at four locations, please identify and describe any sections of the NPS 20 IP pipeline that have been replaced since the line was installed and discuss the potential for leaks on these sections.

**Response:**

**Recorded NPS 20 Coquitlam Gate IP Pipeline Modifications**

Location	Year	Description	Type of Coating	Approximate Length of Replacement
Gaglardi Way	1965	Lowering of existing pipeline	Not applicable (existing pipeline lowered)	Not applicable (existing pipeline lowered)
Stoney Creek	1995	New creek crossing by HDD	FBE Coating	50 m
Trans-Canada Highway	1999	New cased highway crossing	FBE Coating	170 m
East 2 <sup>nd</sup> Avenue <sup>1</sup>	2012	Removed Plidco sleeve	FBE Coating	7 m

Less than 230 m of this 20 km pipeline has been replaced since the line was first installed. The sections of pipe replaced since the pipeline was installed have a much reduced likelihood of corrosion leaks as compared to the existing pipeline. If the fusion-bonded epoxy (FBE) coating has been damaged or is damaged in the future, this coating type is considered to be non-shielding. Due to the presence of a non-shielding coating, the Company believes cathodic protection is an effective mitigation for the hazard of external corrosion for these sections.

<sup>1</sup> Page 6 of Appendix A-1 mistakenly notes that the fourth location was Clark Rd in 1995.

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1.1.9 What was the annual O&M expense for the NPS 20 pipeline for each of the past five years, and how much of this expense was required for additional work related to the coating disbondment issue, such as additional leak surveys, inspections and repairs?

**Response:**

The table below provides the requested information.

Year	Incremental Inspections (Excavations), \$	Incremental Leak Repairs, \$	Incremental Leak Surveys, \$	Routine O&M, \$	Total O&M, \$	Incremental O&M Due to Integrity Concerns Arising From Field-Applied Coating Disbondment
2010	0	73,822		1,515	<b>75,337</b>	<b>73,822</b>
2011	1,039,797	189,489		5,303	<b>1,234,588</b>	<b>1,229,286</b>
2012	157,156	85,298		2,655	<b>245,109</b>	<b>242,454</b>
2013	463,000	775,598	11,048	6,152	<b>1,255,798</b>	<b>1,249,646</b>
2014	0	62,715	36,028	4,882	<b>103,624</b>	<b>98,742</b>
<b>Total</b>	<b>1,659,953</b>	<b>1,186,921</b>	<b>53,596</b>	<b>20,532</b>	<b>2,921,002</b>	<b>2,900,470</b>

1.1.10 What was the typical cost of repairing a leak due to coating disbondment on the NPS 20 pipeline?

**Response:**

Repair costs for leaks on the NPS 20 Coquitlam Gate IP pipeline in 1987, 1994, 1999, and 2001 are unknown. The average repair cost for leaks on this pipeline from 2010 to date is \$107,901.88.

Year	Date	Location	Cause of Leak	Repair Method	Cost of Leak Repair
1987	November 18, 1987	Springer Ave & Braelawn, Burnaby	<b>external corrosion</b>	Not available	Not available
1994	November 7, 1994	E. 2nd & Commercial Dr., Vancouver	<b>external corrosion</b> under field applied coating at girth weld	Weld Patch	Not available

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Year	Date	Location	Cause of Leak	Repair Method	Cost of Leak Repair
1999	August 18, 1999	3434 E. 2nd Ave, Vancouver	<b>external corrosion</b> under field applied coating at girth weld	Plidco Sleeve	Not available
2001	February 1, 2001	Brentlawn Lane @ Fairlawn, Burnaby	<b>external corrosion</b> under field applied coating at girth weld	Weld Patch	Not available
2010	February 18, 2010	Como Lake Ave 64 m west of Mariner Way, Coquitlam	<b>external corrosion</b> under field applied coating at girth weld	Weld Patch	\$73,822.00
2011	March 18, 2011	7584 Broadway, Burnaby	<b>external corrosion</b> under field applied coating at girth weld	Cut Out	\$189,488.59
2012	May 24, 2012	2525 Como Lake Rd., Coquitlam	<b>external corrosion</b> under field applied coating at girth weld	Cut Out	\$85,297.58
2013	May 6, 2013	7578 Broadway, Burnaby	<b>external corrosion</b> under field applied coating at girth weld	Split Sleeve	\$114,989.38
	June 27, 2013	Halifax & Springer St., Burnaby	<b>external corrosion</b> under field applied coating at girth weld	Split Sleeve	\$142,670.18
	July 17, 2013	4100 Halifax St., Burnaby	<b>external corrosion</b> under field applied coating at girth weld	24" Casing	\$106,631.09
	August 8, 2013	4330 Blk Halifax St., Burnaby	<b>external corrosion</b> under field applied coating at girth weld	Weld Patch	\$124,906.52
	August 20, 2013	4330 Halifax St., Burnaby	<b>external corrosion</b> under field applied coating at girth weld	24" Casing	\$181,279.19
	August 23, 2013	Como Lake Rd & Baker St., Coquitlam	<b>external corrosion</b> under field applied coating at girth weld	24" Casing	\$47,264.09
	October 9, 2013	4100 Block Halifax St, Burnaby	<b>external corrosion</b> under field applied coating at girth weld	Weld Patch	\$57,857.21
2014	March 4, 2014	Halifax St. & Gilmore Ave, Burnaby	<b>external corrosion</b> under field applied coating at girth weld	Split Sleeve	\$62,714.89



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1  
2 1.2 Considering the higher number of leaks identified in 2013, please discuss  
3 whether a reasonable methodology to predict the likely number of leaks in 2033  
4 is to multiply 3.7 times the average number of leaks over the period 2010 through  
5 2014.  
6

7 **Response:**

8 Dynamic Risk Assessment Systems Inc. (DRAS) provided the following response:

9 The reliability analysis that is described in the Quantitative Reliability Assessment Report  
10 employs a stochastic modeling technique known as a Monte Carlo analysis. In this analysis,  
11 corrosion feature size data obtained from a sampling program were utilized to generate  
12 distributions for which the distribution parameters were determined. As described in greater  
13 detail below, these distribution parameters were used in conjunction with a remaining life  
14 analysis to establish leak frequency estimates for specific future years.

15 Given the distribution parameters associated with corrosion feature size and the growth rates  
16 inferred from those corrosion feature sizes – all obtained from a sampling program, the Monte  
17 Carlo analysis established the likelihood that a corrosion feature will fail in a specified future  
18 year. Using the corrosion feature size distribution and growth rate parameters obtained from a  
19 sampling program, the Monte Carlo analysis utilizes a random number generator to produce a  
20 distribution of corrosion feature sizes at specified future years. This is performed over multiple  
21 simulations, and the result of each simulation is characterized as either a pass or fail through  
22 the utilization of known limit states for rupture and leak. By counting the number of 'fail' results  
23 over a specific number of simulations (in this case, 1,000,000 simulations were used), a  
24 likelihood of failure, given the presence of a corrosion feature is obtained for the year of interest.  
25 The leak rate is then obtained by multiplying that failure likelihood by an estimate of the number  
26 of corrosion features that are in the Coquitlam NPS 20 IP pipeline (also estimated through a  
27 sampling program).

28 The above analysis is characteristic of stochastic modeling techniques that are utilized in the  
29 broader field of reliability analysis. This analysis does not utilize any one year or any group of  
30 years, such as the period 2010 through 2014, as a bench mark for the projection of future year  
31 reliability indices. Utilizing any one year or any group of years as a bench mark for the  
32 projection of future year reliability indices is not characteristic of any known reliability technique,  
33 as it would not be considered statistically or methodologically sound.

34

35

36

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1.2.1 What number of leaks in 2033 would there be using this methodology?

**Response:**

DRAS provides the following response:

The average number of leaks over the period 2010 through to 2014 is 2.5 leaks/year. Multiplying this result by 3.7 would yield a result of 9.3 leaks in the year 2033. As explained in the response to BCUC IR1.1.2, a result calculated in this manner is not considered to be based on an approach that is statistically or methodologically sound.

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**2.0 Reference: A Safety and Regulatory Concern**

**Exhibit B-1, Section 3.1.2.2, p. 18; Exhibit B-1-2, Appendix A-1, p. 5**

**Leaks Determining End of Service Life**

The utility states on page 18:

FEI has determined that leaks cannot be prevented through maintenance....FEI has concluded that replacement of this pipeline is most appropriate solution to prevent future leaks.<sup>2</sup>

In Appendix A-1, a Quantitative Reliability Assessment prepared by Dynamic Risk Assessment Systems Inc., Table 1, which shows leak and rupture frequency vs. time, is said to be based upon a data set.<sup>3</sup>

2.1 Please explain what data set was used, what is the accuracy range of that data, and what is the accuracy range for the data in Table 1.

**Response:**

DRAS provides the following response:

The dataset is described in Section 3.1 of the Quantitative Reliability Assessment Report. As outlined in that Section:

*“A total of 44 corrosion features, obtained from 25 girth weld regions were obtained. Three of the 44 features, including one feature that had penetrated through-wall, had maximum corrosion depths in excess of 70% of the wall thickness. These three features were deemed to be representative of a sampling bias, since the excavation data were obtained from regions where leaks had occurred previously. One feature was located on a section with heavier wall thickness (11.8mm) and caused a spike in the failure pressure data sampling. Therefore, in order to mitigate the potential for conservatism in the analysis, those four corrosion features were removed from the dataset, leaving 40 corrosion features. The excavations that were performed to collect these data focussed on 25 girth weld areas. Out of the 25 girth weld areas, 14 girth weld areas were associated with leak sites whereas the other 11 were randomly selected. Therefore, the 13 corrosion features within the randomly selected 11 excavation sites were used to calculate an average corrosion feature incidence rate of 1.18 corrosion features per girth weld region.”*

<sup>2</sup> Exhibit B-1, p. 18.

<sup>3</sup> Exhibit B-1, Appendix A-1, p. 5.

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The reliability model that was employed in estimating leak frequency utilized a Monte Carlo analysis. This is a stochastic modeling technique that provides reliability estimates (in this case, leak frequency), however it does not provide estimates of variance. Nevertheless, the accuracy of the leak frequency predicted in Table 1 of the Quantitative Reliability Assessment Report is primarily dependent on the following factors:

1. The degree to which the data obtained from the excavations described above are representative of the condition of the pipeline (Variability of the Sampling Distribution);
2. The validity of the growth rate assumptions used in the analysis;
3. The distributions of the material properties used in the limit state equations that form the basis of the analysis, and,
4. The number of iterations that were included in the Monte Carlo analysis that formed the basis of the reliability approach.

Each of the above are addressed in turn below:

#### Variability of the Sampling Distribution

As described in the Quantitative Reliability Assessment Report, two sets of corrosion feature sample sets were used – one to establish the mean number of corrosion features per girth weld, and the other for the purposes of the remaining life calculations. The variance that is associated with sampling techniques is dependent on sample size, with larger sample sizes being associated with lower variance. A sample size of 40 (which is considered large) was used for the purposes of the remaining life calculations. However, for the purposes of estimating the mean number of corrosion features per girth weld, in order to avoid sampling bias associated with girth welds that were associated with leaks, only randomly-selected dig sites were used. This amounted to only 11 girth weld locations. Based on this, the mean number of corrosion features per girth weld was determined to be 1.18, and the standard deviation was determined to be 0.874.

From the Central Limit Theorem, the standard deviation of the sampling distribution ( $\sigma_x$ ) is:

$$\sigma_x = \sigma \sqrt{\frac{1}{n} - \frac{1}{N}}$$

Where,

$\sigma$  = the standard deviation of the sample

$n$  = the sample size (in this case, 11), and,

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N = the population size, which, as stated in the Quantitative Reliability Assessment Report is 1,667 girth welds in the pipeline

Based on the above, the standard deviation of the sampling distribution is 0.263.

Utilizing a z-statistic analysis, a 95% confidence interval for the mean number of corrosion features in a girth weld was determined to be 0.748 to 1.612 (i.e., +/- 37% of the predicted value of 1.18).

Therefore, based solely on the confidence interval for the estimate of the mean corrosion feature incidence rate per girth weld, 95% confidence interval for the estimates provided in Table 1 is +/- 37%.

#### Validity of the Growth Rate Assumption

The mean corrosion growth rate for any corrosion feature can be determined by dividing the observed feature size by the time over which active corrosion has occurred. While the observed feature size can be readily and accurately determined through field measurement, the number of years of active corrosion cannot, and so assumptions need to be made. As outlined in the Quantitative Reliability Assessment Report, an assumption was made that the number of years of active corrosion for each feature can be determined as the pipe age (at the time of corrosion feature measurement) minus 5 years. The type of asphalt coating system that was used on the Coquitlam NPS 20 IP pipeline is susceptible to degradation over time. Therefore, assumptions such as that described above, that consider an 'incubation period' for coating degradation to occur prior to the onset of corrosion are often used in reliability analyses performed on pipelines that are coated with similar coating systems. However, in reality, there is no way of establishing the number of years that corrosion has been active on any given feature. Therefore, while the active growth period assumption provides a reasonable basis for estimating remaining life, the results that are generated must be taken as nominal values, as there is no way of calculating a confidence interval that is associated with the active growth period assumption.

#### Material Property Distributions

As outlined in Section 3.2.2 of the Quantitative Reliability Assessment Report, remaining life estimates were based on the time required to exceed either one of two separate limit state relationships:

- i) Calculated failure pressure  $\leq$  Operating Pressure; and,
- ii) Corrosion depth  $\geq$  Wall Thickness.

While the analysis considered both of the above limit states, due to the low operating stress level of the Coquitlam NPS 20 IP pipeline, it was the second of the two limit states that determined onset of failure. Therefore, the material property distribution of interest is that of

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1 wall thickness. In the analysis, in each simulation that was performed, the nominal wall  
2 thickness of 6.35 mm was used for the purposes of the analysis. While no wall thickness  
3 dataset is available that is representative of the wall thickness distribution for the Coquitlam  
4 NPS 20 IP pipeline, an estimate of wall thickness distribution parameters is provided in Clause  
5 O.2.7.4 of CSA Z662-11, as follows:  $\sigma = 1.0 \times \text{Nominal}$ ,  $\sigma = 0.25$  mm (Normal). For the leak limit  
6 state, remaining life is proportional to wall thickness. Therefore, a 95% confidence interval on  
7 any remaining life calculation is equal to  $\pm 2\sigma$  (i.e.,  $\pm 7.9\%$ ).

#### 8 Number of Iterations Used in the Monte Carlo Analysis

9 The variance of any Monte Carlo simulation is inversely proportional to the number of  
10 simulations performed. For the purposes of the analysis performed in the Quantitative  
11 Reliability Assessment Report, 1,000,000 simulations were run, which is very large, given the  
12 magnitude of probability values that were being generated in the analysis. In order to provide  
13 an estimate of the confidence interval attributed to the number of simulations, a distribution of  
14 the results reported in Table 1 of the Quantitative Reliability Assessment Report would need to  
15 be generated. This would require in excess of  $1 \times 10^8$  simulations, and would require extensive  
16 computing resources. Ultimately, from the perspective of the variance associated with the leak  
17 frequency estimates provided in Table 1 of the Quantitative Reliability Assessment Report, the  
18 variance associated with the Monte Carlo analysis over which 1,000,000 simulations were  
19 performed would be insignificant relative to the other factors described above.

20  
21  
22  
23 2.2 The number of detected leaks has declined significantly in 2014 compared to  
24 2013. Could this be the result of successful mitigation activities by FEI? What  
25 additional evidence does FEI have that would suggest the coating disbondment  
26 issue is developing elsewhere on this pipeline?  
27

#### 28 Response:

29 FEI has assessed that the existing NPS 20 Coquitlam Gate IP pipeline is nearing the end of its  
30 useful life and requires replacement. This is a decision that FEI has considered carefully, taking  
31 due time to assess the corrosion issue that is resulting in leaks, to establish possible courses of  
32 action, and to factor in other matters such as compliance with legislation.

33 FEI's condition monitoring digs, conducted from 2011 to 2013 at a cost of nearly \$1.7 million,  
34 have established that corrosion due to the 1958 construction practices is occurring along the  
35 entire length of the pipeline and at a significant majority of inspected sites. Of the total 38 girth  
36 welds inspected along the length of the existing NPS 20 Coquitlam Gate IP pipeline, 74% have

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1    been found with field-applied girth weld coating disbondment. Pipe under disbonded coating is  
2    susceptible to active corrosion and leaks. The observed clusters of leaks to date are believed to  
3    be a result of local site conditions resulting in similar site-specific corrosion rates. Based on the  
4    systemic disbondment, the locations of past clusters cannot be relied upon as an indicator of  
5    where future leaks may occur.

6    The fluctuation in numbers of actual leaks from one year to the next is not unexpected, and is  
7    characteristic of almost all physical processes. FEI submits that the increasing leak frequencies  
8    estimated in the Dynamic Risk Quantitative Reliability Assessment (projected frequency of 8.7  
9    leaks in 2013, increasing by 370% to 2033), included as Appendix A-1 (Exhibit B-1-1), is based  
10   on actual pipeline corrosion depth measurements and an approach that is statistically and  
11   methodologically sound (as described in the response to BCUC IR 1.1.2).

12   As described in Section 3.1.2.2 of the Application, Exhibit B-1, corrosion is resulting from  
13   shielding of the field-applied girth weld coating. Under the circumstances of cathodic protection  
14   (CP) shielding, FEI cannot detect locations where the pipe is receiving inadequate CP current  
15   levels despite a fully functioning and effective CP system. Furthermore, corrosion cannot be  
16   effectively managed or prevented by increasing cathodic protection levels in the pipeline, since  
17   shielding prevents CP currents from reaching the surface of the pipe under disbonded coating.  
18   Based on findings from FEI's condition monitoring digs, a lack of leaks at coating holidays, and  
19   recorded CP levels, FEI is confident that the CP system is operating as per design.

20   Even when the effectiveness of CP is not inhibited by shielding, it should be noted that once  
21   corrosion damage has occurred along a pipeline, CP programs may limit further damage, but  
22   they cannot reverse damage which has already occurred. Because the Coquitlam Gate IP  
23   pipeline is not piggable, it is not possible for FEI to identify areas where this damage has  
24   reached levels that are close to leaking. Therefore, corrosion will continue, and such corrosion  
25   will result in increasing numbers of failures on the Coquitlam Gate IP pipeline.

26   FEI has not identified any mitigation activities, other than replacement of the pipeline, which will  
27   prevent future leaks. Although the pipeline is considered suitable for continued service with the  
28   present interim mitigation activities until the pipeline can be replaced, FEI believes that  
29   replacement is congruent with the requirements of the Oil and Gas Activities Act and the  
30   Canadian Standards Association Z662 standard (refer to the response to BCOAPO IR 1.1.1).  
31   On that basis, FEI has developed a plan to address the ongoing non-preventable active  
32   corrosion by replacing the pipeline and has notified the OGC of that intended course of action.

33

34

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2.3 Please discuss what proactive or preventative maintenance FEI has explored, if any, to prevent future leakage.

**Response:**

As discussed in the Application, the safety risk associated with operation of this pipeline that exhibits an increasing leak occurrence and risk of gas migration and accumulations in public areas is currently being managed through mitigation measures such as odourization, leak detection (more frequent leak surveys), and leak response.

Further, FEI conducted 18 excavations of the existing NPS 20 Coquitlam Gate IP pipeline between 2011 and 2013. Excavations were undertaken to understand the leak cause and to evaluate potential tools for preventing future leaks on the pipeline. The information obtained from these excavations, as well as at past leak sites, indicates corrosion under disbonded field-applied joint coatings associated with cathodic protection shielding.

As discussed in FEI's response to OGC General Order 2013-25 (included as Appendix A-3 (Exhibit B-1-1)) and in FEI's response to BCUC IR 1.2.2, under the circumstances of cathodic protection (CP) shielding, pipeline operators cannot detect locations where the pipe is receiving inadequate CP current levels. Furthermore, corrosion cannot be effectively managed or prevented by increasing cathodic protection levels in the pipeline, since shielding prevents CP current from reaching the surface of the pipe under disbonded coating.

In-line inspection has not been deemed a viable option due to low operating pressures and the expected presence of inside diameter restrictions.

As stated in FEI's response to OGC General Order 2013-25:

*"With consideration to the cause of leaks, extent of leaks, expected increase in leak frequency, and lack of effective prevention methods, FortisBC has determined that pipe replacement is the most appropriate mitigation method."*

2.4 Are there any other measures/indications that this pipeline is nearing the end of its useful life? If so, what are these other measures/indications?

**Response:**

The existing Coquitlam Gate IP pipeline has been in service since 1958. The existing NPS 20 Coquitlam Gate IP pipeline has been assessed as nearing the end of its useful life due to the



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non-preventable and increasing projected leak frequency due to external corrosion beneath the field-applied girth weld coating along the length of the pipeline.

No other measures/indications were utilized nor considered necessary by FEI.

2.5 In each year from 2010 through 2014, how many leaks did FEI identify on each of its TP, IP and Distribution pipeline systems?

**Response:**

The following table summarizes the number of leaks identified on each of the FEI TP, IP, and DP systems by year.

Leaks	2010	2011	2012	2013	2014
TP	0	0	1	0	1
IP	11	12	10	12	12
DP	2,153	2,062	1,948	1,735	1,519
<b>Total</b>	<b>2,164</b>	<b>2,074</b>	<b>1,959</b>	<b>1,747</b>	<b>1,532</b>

2.5.1 In each category, how many of the leaks were due to damage by other parties?

**Response:**

The following table summarizes the number of below-grade system leaks due to damage by other parties.

Leaks due to Damage	2010	2011	2012	2013	2014
TP	0	0	0	0	0
IP	2	1	2	2	1
DP	1,455	1,328	1,092	953	953
<b>Total</b>	<b>1,457</b>	<b>1,329</b>	<b>1,094</b>	<b>955</b>	<b>954</b>

Please also refer to the response to BCUC IR 1.2.5.

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2.6 For each of TP, IP and DP pipeline systems, please identify and justify the standards or criteria for an unacceptable number of leaks that FEI uses to determine when a system is approaching the end of its service life.

**Response:**

Leak frequency alone is not solely relied upon by FEI in determining when a pipeline is approaching the end of its service life.

For DP pipelines, FEI has developed and implements a mains renewal program whereby segments of piping are prioritized for replacement based on many risk factors.

A piggable TP pipeline may be assessed as approaching the end of its service life if it is determined through in-line inspections, excavations, and operating history that the available technology could not effectively and reliably predict potential leaks/failures in advance of their occurrence. In the absence of this scenario, it may be possible to operate a piggable TP pipeline until such time as it becomes economically advantageous to undertake replacement versus performing discrete site-specific repairs.

A non-piggable IP or TP pipeline may be assessed as approaching the end of its service life, similar to the NPS 20 Coquitlam Gate IP pipeline, if it is determined that the pipeline will experience or is experiencing non-preventable failures. The potential consequences of failure would be considered in assessing end of service life before a failure has actually occurred on a given pipeline.

For IP and TP pipelines, the decision to assess a pipeline as approaching the end of its service life is a process that is expected to vary depending on the asset and the circumstances, and will invariably not only require assessment of all available data, but also engineering judgment.

2.7 In each year from 2010 through 2014, how much Lost and Unaccounted For (UAF) gas did FEI record on its system, expressed in thousands of cubic metres and as a percentage of system throughput?

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**Response:**

The table provided below provides the 2010-2014 Unaccounted For Gas (UAF) for FEI.

**2010-2014 UAF - FEI (Lower Mainland, Inland, and Columbia Service Areas)**

		2010	2011	2012	2013	2014
System Throughput	(10 <sup>3</sup> m <sup>3</sup> )	5,079,239	5,345,731	5,269,398	5,215,081	5,104,013
UAF - Quantity	(10 <sup>3</sup> m <sup>3</sup> )	6,369	31,331	17,969	32,938	44,575
UAF - Qty as percentage	(%)	0.13%	0.59%	0.34%	0.63%	0.87%
UAF - Value in dollars	(\$)	\$ 1,051,993	\$ 4,057,883	\$ 1,723,098	\$ 3,874,096	\$ 7,302,551

2.7.1 What was the dollar value of the UAF gas each year?

**Response:**

Please refer to the response to BCUC IR 1.2.7.

2.7.2 Please discuss how material the amount of gas lost from leaks on the NPS 20 IP pipeline is, compared to the system wide amount of UAF.

**Response:**

FEI has a record of estimates of gas lost for 9 leaks on the NPS 20 Coquitlam Gate IP pipeline dating from 2012 onward. This volume equates to 9852 m<sup>3</sup>. If this value is prorated to provide an estimate for the total of 15 recorded leaks, an estimate of the total gas lost from leaks on the Coquitlam Gate IP pipeline becomes:

$$(9852 \text{ m}^3 / 9 \text{ leaks}) \times (15 \text{ leaks total}) = 16,420 \text{ m}^3 = 16 \text{ } 10^3 \text{ m}^3$$

This value, which has occurred over a time period of 1987 to 2014, is considered insignificant relative to the system wide reported UAF.

Please also refer to the response to BCUC IR 1.1.1.

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2.7.3 Please provide any other information that FEI has about gas losses from its system, relative to the amount lost from leaks on the NPS 20 IP pipeline.

**Response:**

As stated in FEI’s Response to OGC General Order 2013-25, in reference to the NPS 20 Coquitlam Gate IP pipeline:

*“FortisBC has analyzed gas volume estimates at past leaks and concluded that the incremental environmental risk due to leaks on the subject pipeline is not material.”*

The total fugitive emissions for the FEI system in 2013, as reported on the BC Ministry of Environment website, were 43,814 tCO<sub>2</sub>e (tonnes of carbon dioxide equivalent) using a global warming potential of 21 for methane. By comparison, the seven external corrosion leaks on the NPS 20 Coquitlam Gate IP pipeline in 2013 resulted in an estimated release of 129 tCO<sub>2</sub>e.

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**3.0 Reference: Coquitlam Gate IP**

**Exhibit B-1, Section 3.1.2.3, p. 20 and Section 3.2.2.1, p. 31**

**Project Justification – Operational Flexibility**

FEI states that the Coquitlam line “cannot be relied on to support the Metro IP system at any time of the year without some support from Fraser gate”<sup>4</sup> this is in part due to the increasing growth in demand on the system reducing the operational flexibility of the Coquitlam line.

FEI also states that “[o]perational flexibility is the ability to isolate a section of pipeline as required...”<sup>5</sup>, and “...the pipeline design capacity ha[s] to meet forecasted design degree day load (i.e. peak demand) for the 20 year planning period.”<sup>6</sup>

3.1 Prior to the erosion of the operational flexibility please confirm, otherwise explain, if the Coquitlam line was able to sufficiently supply the Metro IP system year round without input from the Fraser gate.

**Response:**

The existing Coquitlam Gate IP pipeline had the ability in the past to support the isolation of Fraser Gate or the isolation of the Fraser Gate IP pipeline segments north of Fraser Gate for a portion of the year, providing operational flexibility. FEI is unable to confirm if the Coquitlam Gate IP pipeline was ever able to supply the system year round without support from Fraser Gate.

3.2 Please provide the maximum capacities of the existing Coquitlam IP pipeline, existing Fraser Gate IP pipeline, replaced Coquitlam IP Pipeline and replaced Fraser Gate IP pipeline.

**Response:**

The Fraser Gate IP and Coquitlam Gate IP pipelines are not independent pipelines but components of an integrated gas delivery system, the Metro IP system. The capacity of the pipelines therefore depends on the configuration of the complete system it is a component of and the specific demands of that system.

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<sup>4</sup> Exhibit B-1, p. 20.

<sup>5</sup> Exhibit B-1, p. 20.

<sup>6</sup> Ibid., p. 31.

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The Fraser Gate IP Project is a replacement project where an existing NPS 30 pipeline segment will be replaced with a new NPS 30 segment. There will be no change in system capacity as a result of this project.

The Coquitlam Gate IP pipeline replacement, however, will positively impact the capacity of the either pipeline to support the system. The following four hypothetical situations illustrate the relative capacity of the pipelines to a uniformly applied decrease or increase in system loading to maintain a minimum system design pressure at the weakest point of the system without the support of the other. Note however, that because pressure decay and therefore delivery capacity in the system is exponential in nature, one cannot make any direct inferences to other cases by adding or subtracting numbers in the table below. For example, although the existing Metro IP system is fully capable of supporting more than the current design peak hour demand when working as a whole, by adding the percent of peak hour design supported by each pipeline independently would suggest a value less than 100%.

**Pipeline Capacity Comparison Table**

IP System	IP Pipeline	Fraser Gate Supply	Coquitlam Gate Supply	% of 2014 Peak Hour Demand	Pipeline flow* (m <sup>3</sup> /hr)
Existing Metro IP system	Fraser Gate IP Pipeline	on	off	63.50%	383,700
	Coquitlam Gate IP Pipeline	off	on	22.00%	133,300
Proposed Metro IP System	Fraser Gate IP Pipeline	on	off	107.50%	620,700
	New Coquitlam Gate IP Pipeline	off	on	125.00%	726,600

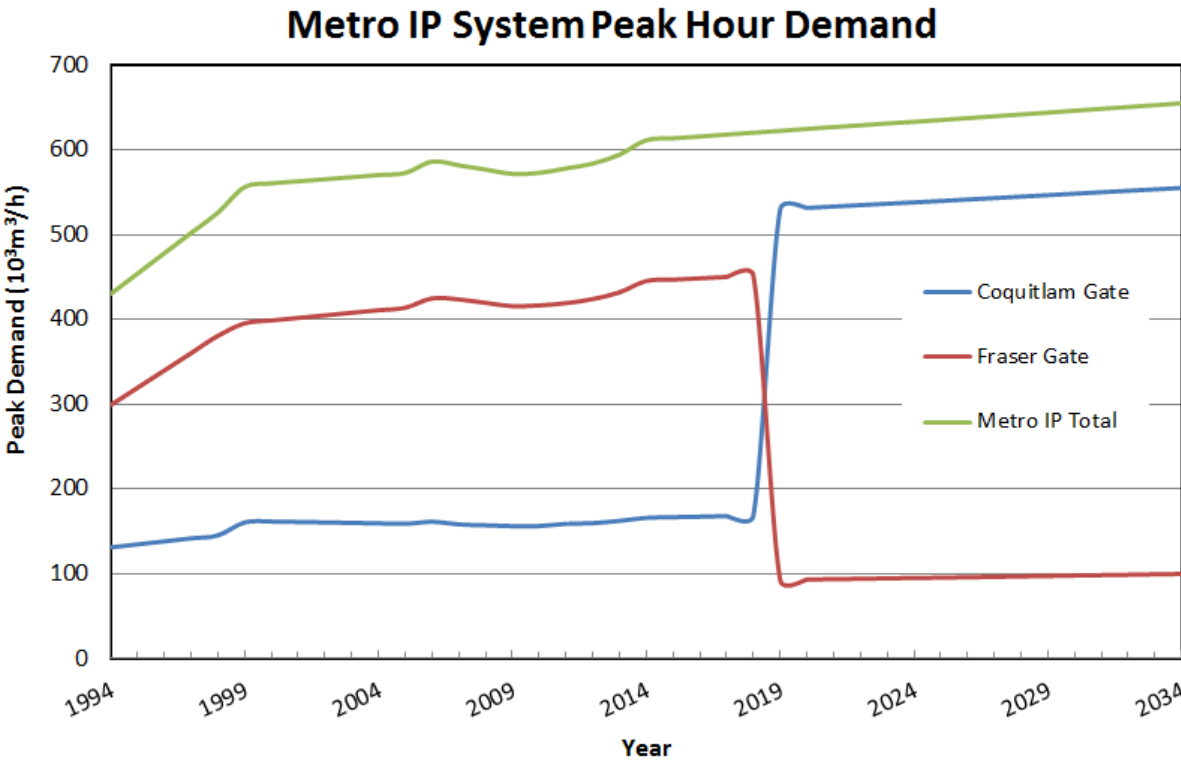
\* as Metro IP system reaches min design pressure constraint

3.3 Please provide graphs of the historical and forecasted design degree day load (i.e. peak demand) on the Metro IP system supplied by the existing Coquitlam IP pipeline, existing Fraser Gate IP pipeline, replaced Coquitlam IP Pipeline and replaced Fraser Gate IP pipeline from 1994 to the end of the 20-year planning period.

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**Response:**

The graph below illustrates the change in peak hour demand, as determined by a review of available historical records, for the design peak hour demand through Coquitlam Gate and Fraser Gate into the Metro IP system. In some case the historical information was unavailable to be plotted. Where this occurred, values were interpolated from years where the data was available. For example, information for 1996 and 1997 was unavailable and was interpolated from data available in the historical record from 1995 and 1998. Values for future years reflect the 2014 load forecast. The load shift between Coquitlam Gate and Fraser Gate in 2019 reflects the commissioning of the proposed NPS 30 Coquitlam Gate IP pipeline at which point the larger part of the Metro IP system will be supported through Coquitlam Gate under normal circumstances.



3.3.1 Please show on the graphs and tables the reduction in operational flexibility. Please indicate on the graph the periods when planned maintenance could have occurred (i.e. the maintenance windows) on

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the Fraser Gate IP or the Coquitlam Gate IP and please fill in the following table for the past 20 years (1994 through to 2014):

	<b>1994 Outage Windows</b>	<b>1995 Outage Windows</b>	<b>1996 Outage Windows</b>	<b>....</b>	<b>2014 Outage Windows</b>
<b>Fraser Gate IP</b>	E.g. July 1, 1999 to August 10, 1999 (40 days) and August 28, 1999 to October 19, 1999 (60 days)				
<b>Coquitlam Gate IP</b>	E.g. October 19, 1999 to November 8, 1999 (20 days)				

**Response:**

The table below provides an estimate of the outage windows available historically as far back as 1994. The information provided gives a general indication of the outage windows that existed. A high degree of certainty on these windows is not possible for periods prior to 2009 as sufficient detail is unavailable in the historical record, or is in a format incompatible with the current modelling software, to determine precisely the operational window available at specific points in time.



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### Estimated Outage Windows Metro IP

Year	Fraser Gate Outage Window	Coquitlam Gate Outage Window
1994	Early July to Early September	Early February to Late November
1995	Early July to Early September	Early February to Late November
1996	Early July to Late August	Early February to Late November
1997	Mid July to Mid August	Early February to Late November
1998	Mid July to Mid August	Early February to Late November
1999	Mid July to Mid August	Early February to Mid November
2000	Late July to Mid August	Early February to Mid November
2001	Late July to Early August	Early February to Mid November
2002	Late July to Early August	Mid February to Mid November
2003	No Window	Mid February to Mid November
2004	No Window	Mid February to Mid November
2005	No Window	Late February to Mid November
2006	No Window	Early March to Mid November
2007	No Window	Early March to Mid November
2008	No Window	Early March to Mid November
2009	No Window	Mid March to Early November
2010	No Window	Mid March to Early November
2011	No Window	Mid March to Early November
2012	No Window	Mid March to Early November
2013	No Window	Mid March to Early November
2014	No Window	Mid March to Late October

3.4 Please describe all current methods for carrying out minor and major maintenance on the Coquitlam line.

**Response:**

Planned maintenance requiring isolation of a segment of pipe is scheduled to minimize service disruption or the need for installation of a bypass.

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Where maintenance flexibility exists the valves upstream and downstream of the section requiring isolation are closed and the repairs are made to the depressurized segment of pipeline.

Where maintenance flexibility does not exist there are a limited number of options available including service disruptions, providing alternative supply to customers, or installing a bypass around the isolated section.

3.5 Please describe the time frame and associated costs for a past routine maintenance job on the Coquitlam line, from shut down to commissioning, and compare this to the time and cost for the same job if the line were operationally flexible. Please also elaborate on the difference in service disruptions, if any.

**Response:**

The existing NPS 20 Coquitlam Gate IP pipeline currently has a period of maintenance flexibility. Routine maintenance on the NPS 20 Coquitlam Gate IP pipeline would be scheduled during a period of maintenance flexibility such that the costs for the same job would not change due to construction of the proposed NPS 30 Coquitlam Gate IP project.

However, there will be a difference in the maintenance flexibility of the NPS 30 Fraser Gate IP pipeline as a result of the proposed NPS 30 Coquitlam Gate IP project. Please refer to the response to BCOAPO IR 1.3.7 for the anticipated costs related to undertaking a bypass for maintenance on the Fraser Gate IP pipeline, which is approximately \$0.8 million per occurrence depending on the complexity. Longer and/or larger diameter bypasses would increase this cost.

3.6 Please provide and explain the cost savings that are likely to be made on the Fraser Gate project as a result of the improved Operational Flexibility on the Coquitlam line.

**Response:**

With the replacement NPS 30 Coquitlam Gate IP pipeline in service, it will be possible to isolate the Fraser Gate IP pipeline and replace the seismically vulnerable segment of pipe with the proposed upgraded pipe without the use of a bypass. This is because the increased capacity of



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- 1 the NPS 30 Coquitlam Gate IP pipeline will be capable of supplying the Metro IP system without
- 2 any supply required from Fraser Gate. Therefore, this will avoid the requirement for a bypass
- 3 during construction of the Fraser Gate project resulting in a saving of approximately \$1.4 million.
- 4

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**4.0 Reference: Coquitlam Gate IP**

**Exhibit B-1, Section 3.1.2.3, p. 20**

**Project Justification – Resiliency**

FEI on page 6 of the Application identified the Coquitlam pipeline as a single point of failure pipeline.<sup>7</sup>

4.1 How frequent (per annum) does FEI experience emergency shut downs on this line?

**Response:**

FEI's early detection of leaks on the Coquitlam Gate IP pipeline due to the current weekly leak survey has enabled some degree of planned shutdown. FEI would characterize the leak repairs that have occurred on this pipeline to date as an unplanned maintenance and repair incidents, rather than emergency shut downs, because it takes time to pinpoint and locate the leak before the pipeline is shut-in and isolated so that repairs may be performed safely. FEI has not experienced an incident on this pipeline that would require an immediate emergency shutdown.

4.1.1 Please categorize the reasons for these shut downs.

**Response:**

Please refer to the response to BCUC IR 1.4.1.

4.1.2 Please explain why year round system resilience has become an important factor in this pipeline's design. Has it been a consideration in the past?

**Response:**

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<sup>7</sup> Exhibit B-1, p. 6.

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“Resiliency” is defined in the Glossary of Terms in the Application as the ability to rebound quickly in case of equipment failure and in Appendix A-5 and A-6 where resiliency has been discussed by consultants in other jurisdictions or proceedings.

The need to replace the existing NPS 20 Coquitlam Gate IP pipeline due to integrity concerns, presented FEI with a unique one-time opportunity to address a lack of system resiliency within the Metro IP system. The Metro IP system serves a greater number of customers than any other IP system in the province and currently delivers natural gas to more than 210,000 customers – almost one quarter of FEI’s entire customer base. As an incremental benefit of the Project, improving the resiliency and operational flexibility of this system, given the need to replace the existing Coquitlam Gate IP pipeline, will provide the security of supply to large numbers of customers. FEI has in the past considered and currently does consider resiliency and operational flexibility important in the design and renewal of pipeline systems, but in general, opportunities do not exist to provide full resiliency such as can be achieved with the proposed Coquitlam Gate IP pipeline Project. The uniqueness of the current opportunity to improve resiliency of the Metro IP System stems from the need to replace the entire length of the Coquitlam Gate IP pipeline. If FEI were to attempt to address resiliency alone by looping or replacing portions of the existing system with larger pipe, phased over time, the improvements to resiliency would be marginal until the last phases of looping or replacement covered the majority of the distance between Coquitlam Gate and East 2<sup>nd</sup> & Woodland stations. Leaving even a few kilometres of NPS 20 pipe in the IP system provides a substantial bottleneck to achieving full resiliency and improved operational flexibility. Additionally, the increase in operating pressure, a consideration available because of the need for the complete pipeline replacement, allows a significantly smaller diameter pipeline, NPS 30 as opposed to NPS 42, to deliver full resiliency. In a phased approach to achieving resiliency, a segment by segment pressure upgrade would be difficult to implement and again would be marginally effective until the phasing extended the length of the pipeline.

The current Metro IP system has the capacity to meet the forecasted peak hour demand throughout the 20 year planning horizon when all components of the system are operational. However, in the event supply is interrupted from either Fraser Gate or Coquitlam Gate, under peak demand, the system is capacity constrained and a rapid pressure collapse along the system would occur impacting as many as 171,000 of the currently connected customers.

The Company evaluated the potential consequences of outages throughout the Metro IP delivery network (including TP pipelines upstream of Fraser Gate and Coquitlam Gate) to estimate the financial impact of these events. As failure events beyond the control of FEI could occur at any time within the year, peak day conditions were selected so that year round resiliency would be achieved. A risk assessment was carried out to determine if there was an opportunity to mitigate this operational risk in a cost effective way. FEI determined that it was

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appropriate to mitigate this risk by replacing the existing NPS 20 Coquitlam Gate IP pipeline with a NPS 30 pipeline operating at 2070 kPa.

Recent disruptions at energy delivery utilities around North America have driven increased industry and government awareness of the essential nature of critical energy delivery infrastructure. For example, the consideration for increased resiliency in infrastructure planning is recognized in Appendix A-7-1 (Exhibit B-1-1) (Government of Canada – National Strategy for Critical Infrastructure) where it states:

*“The National Strategy supports the principle that critical infrastructure roles and activities should be carried out in a responsible manner at all levels of society in Canada. Responsibilities for critical infrastructure in Canada are shared by federal, provincial and territorial governments, local authorities and critical infrastructure owners and operators – who bear the primary responsibility for protecting their assets and services.”*

System resiliency has been considered a factor in recent FEI projects. For example, resiliency was a factor in the Fraser River Crossing Upgrade Project decision (Commission Order C-2-09 issued in March 2009) granting approval of a CPCN to replace both the NPS 20 and NPS 24 South Fraser river crossings in 2012. It was also a consideration in the recent Huntington Station Bypass decision (Commission Order C-6-14 issued in April 2014) granting approval of a CPCN to construct a bypass pipeline around FEI's Huntingdon Flow and Pressure Control Station. In that decision the Commission found that:

*“[...] given the risks and potential severe consequences of large-scale service disruption to 600,000 customers and economic loss resulting from failure of Huntingdon Station, a risk mitigation project is in the public interest.”*

In summary, FEI has determined that an opportunity exists to significantly improve the resiliency, operational flexibility, and overall reliability of the natural gas supply to a significant portion of the population of the Metro Vancouver region. Under the existing conditions, a failure of either the Coquitlam Gate or Fraser Gate pipeline project could have an adverse economic effect and inflict significant harm to the public and to public confidence in the energy infrastructure. The Projects will result in a more reliable and resilient system that will significantly reduce the probability and consequences of such an event. FEI believes that the construction of the Projects will create a resilient infrastructure in the Metro Vancouver area, is in the best interest of the ratepayer and is consistent with the intent of the Government of Canada National Strategy for Critical Infrastructure.

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4.1.2.1 Please quantify the number of past outages, if any, that would have been prevented, or had reduced impact, if the current Metro IP system had been more resilient.

**Response:**

Please refer to the response to BCUC IR 1.1.1.2 for a list of known outages that occurred due to the documented corrosion leaks on the existing NPS 20 Coquitlam Gate IP pipeline. These outages may not have all occurred if the current Metro IP system had been more resilient.

4.1.3 Please compare the incremental cost of the proposed Coquitlam pipeline necessary to provide full system resiliency to the Metro IP system to the cost of the outages that would benefit from this added resiliency over the 20 year planning horizon.

**Response:**

The 20 year PV of the cost of service for Alternative 4 is \$210.996 million; the 20 year PV of the cost of service of Alternative 6 is \$242.775 million. The difference is \$31.779 million.

FEI has calculated the cost of the outages that would benefit from the added resiliency of Alternative 6 as a reduction in operation risk at \$2.456 million per year and the cost of the outages that would benefit from the added resiliency of Alternative 4 as a reduction in operation risk at \$0.352 million per year, as recalculated in the response to BCUC IR 1.22.7. The 20 year PV of the operating risk reduction associated with Alternative 6 is \$27.853 million. The 20 year PV of the operating risk reduction associated with Alternative 4 is \$3.992 million. The difference in the PV of the operating risk reduction between Alternatives 4 and 6 for the 20 year period is \$23.861 million (\$27.853 - \$3.992).

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**B. PROJECT ALTERNATIVES – COQUITLAM GATE**

**5.0 Reference: Alternatives Description**

**Exhibit B-1, Section 3.2.2, p. 31**

**Pipeline Design Load Methodology**

The utility states on page 31:

The alternatives also considered the criteria that, at a minimum, the pipeline design capacity had to meet forecasted design degree day load (i.e. peak demand) for the 20 year planning period.<sup>8</sup>

5.1 Please describe the methodology that FEI uses to calculate the required design peak demand and design capacity for the proposed new pipeline from Coquitlam Gate station.

**Response:**

The methodology is a two-step process and is consistent with the practice used to assess distribution projects submitted as part of previous FEI regulatory filings.

The first step involves updating the current network hydraulic model with current peak hour demand for each customer.

FEI determines peak hour demand through an annual load gather assessment. In the load gather process, billing information for the preceding two year period is extracted for all customers. With a custom software application, the billing information and temperature information is reduced to a daily average demand for each billing period and compared to the average mean daily temperature for the same billing period. For customers billed monthly, 24 daily demand versus mean daily temperature values are determined. When available, daily or hourly measurement data is used in place of monthly billing data. A linear regression for each customer is performed on this data and a base load and slope (standard m<sup>3</sup>/day/degree Celsius) are determined. The peak day demand for the customer equates to the demand corresponding to the Design Degree Day (DDD) value for the region the customer resides in. For the customers in the Metro IP system, the DDD is a 31DD (-13 C mean daily temperature). The DDD peak demand values are converted to an hourly demand by applying a peak hour factor. The custom software application generates a file that can load the peak hour demand for each customer into a network hydraulic model and places that demand at the point in the FEI network where the customer is located.

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<sup>8</sup> Exhibit B-1, p. 31.



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FEI uses peak hour demand as a design basis in all distribution systems, including IP systems. Peak hour demand can be up to 44% higher in the Metro IP System than the average hourly demand over a 24 hour period (peak day demand/24). For distribution systems, because of generally smaller pipe sizes and lower operating pressures there is insufficient gas contained within the pipeline (line-pack) to adequately support the hourly variations in demand. As a result, design capacity supports peak hour demand.

The second step involves determining future loads and then applying those loads to a network model of the IP system to represent a future year within the 20 year planning period.

To determine loads for models for each year of the 20 year planning period, the current station loads for each station are extracted into a 20 year station load table from the current hydraulic model of the Metro distribution system.

The stations are organized by community and the proportion of the community load represented by each station is determined. Each community's annual load increment is determined by summing the product of each core rate class' account additions forecast for that year by the regional use per customer for that rate class. Load is applied each year to each station in the community in proportions described above and this proportional distribution is assumed constant over the planning period.

The hydraulic model is a detailed and current representation of the distribution or transmission pipelines and regulating stations. With the load applied to the model, the modelling software can determine the expected flow and pressure at any point in the system and determine the impacts of changes to piping or station configurations. Models of the Metro IP system built from current assessments of peak hour demand were used to determine the effectiveness of various Coquitlam Gate IP pipeline alternatives.

#### 5.1.1 Which years are covered by the 20-year planning period?

#### **Response:**

The 20-year planning period covers the period from 2014 to year end 2034.

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5.1.2 Please discuss whether FEI is designing the pipeline to meet design peak day or design peak hour demand, and explain the reasons for the design basis used.

**Response:**

Consistent with the methodology used to assess distribution projects submitted as part of previous regulatory filings, FEI uses peak hour demand as a design basis in all distribution systems, including IP systems. FEI is therefore designing the Coquitlam Gate IP Project to meet design peak hour demand. Please also refer to the response to BCUC IR 1.5.1 for further discussion on the design basis.

5.1.3 If the calculation of design peak day or design peak hour load is based on annual demand, please include an example of the calculation of design peak load.

**Response:**

The calculation of design peak hour demand is not based on annual demand. Please refer to the response to BCUC IR 1.5.1.

5.1.4 For the Coquitlam Gate IP pipeline, does the criteria that capacity meet forecasted design load apply on the basis that all of the rest of the system is in service or that another critical part of the IP system (e.g. the Fraser Gate station) is out of service?

**Response:**

The criteria as stated in the reference refers to a “minimum” requirement that all considered options have sufficient capacity, with all components of the Metro IP system in operation, to meet the forecasted demand to the end of the 20 year planning period. For example FEI would not consider an alternative such as replacing the Coquitlam Gate IP pipeline with a smaller diameter pipe that would require upgrading before the end of 2034 to meet requirements with both the Fraser Gate and Coquitlam Gate IP pipelines in service.

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5.1.5 In general, when designing an IP pipeline system or lateral, does FEI provide full redundancy so that all customers will continue to be served at design peak demand even if one part of the system is out of service?

**Response:**

FEI considers resiliency and operational flexibility when designing its IP pipeline systems and will take cost effective measures to improve the reliability of systems if opportunities to do so are present. In general, FEI does not encounter opportunities to provide full resiliency to all customers at peak demand.

Please also refer to the response to BCUC IR 1.4.1.2 for a discussion of FEI's approach to resiliency and operational flexibility.

5.1.5.1 If FEI does not design on the basis of full redundancy, please explain the criteria that it uses to determine an acceptable level of outage and disruption of supply to customers in the event that a part of that IP system is out of service.

**Response:**

Although FEI does consider resiliency and operational flexibility important in the design and renewal of pipeline systems, as discussed in the response to BCUC IR 1.4.1.2, FEI does not design on the basis of full redundancy and does not have an established redundancy criteria based on an acceptable level of outages and disruption of supply to customers. FEI treats each project uniquely and considers any opportunities that may improve customer reliability, but recognizes that it would be impractical and cost prohibitive to design even some moderately sized systems to full redundancy.

The Coquitlam Gate IP pipeline replacement is an example of a project that can mitigate very high consequences associated with loss of natural gas supply based on the opportunity presented by the need to replace a pipeline nearing the end of its service life.

Please also refer to the response to BCUC IR 1.4.1.2 for additional discussion on the unique opportunity to achieve full resiliency with the Coquitlam Gate IP Project.

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## 6.0 Reference: Alternatives Description

**Exhibit B-1, Section 3.2.2, p. 31; Exhibit B-1-1, Appendix F, p. 3**

### Load Forecasts

On page 3 of Appendix F, the utility defines design day or design hour demand as:

The maximum expected amount of gas in any one day or hour required by customers on the utility system.<sup>9</sup>

6.1 Please provide the current annual, design peak day or design peak hour (as appropriate) loads and number of customers for customers served off the Fraser Gate station to Coquitlam Gate station IP system.

#### **Response:**

Under design peak hour conditions for 2014-15 the load and number of customers served off the Metro IP system are:

Design Peak Hour Load (std. m <sup>3</sup> /hour)	Customers Served
611,000	212,400

6.1.1 Please provide a diagram showing the current design peak load and number of customers at each location where gas is delivered from the IP system to the Distribution system

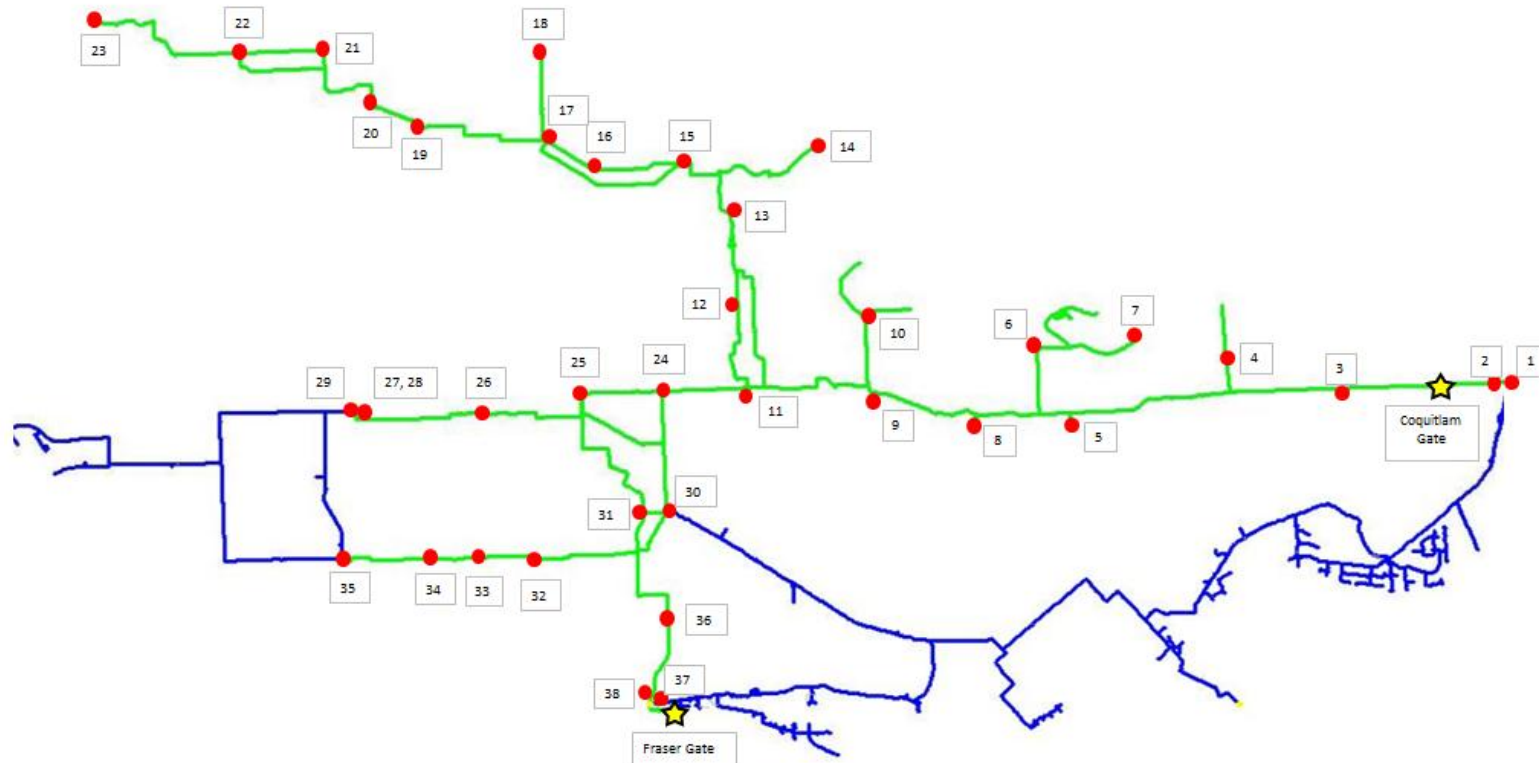
#### **Response:**

The diagram below illustrates the location of the delivery points on the FEI Metro IP system where gas is delivered into the distribution system. The table following provides the design peak hour deliveries and approximate number of customers served for each delivery point for both the current year and the end of the 20-year planning period.

<sup>9</sup> Exhibit B-1-1, Appendix F, p. 3.

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### Metro IP System IP/DP Delivery Points



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### Metro IP System IP/DP Delivery Points

Location	Station Name	2014		2034	
		Peak Load (m <sup>3</sup> /hr)	Customers	Peak Load (m <sup>3</sup> /hr)	Customers
1	Como Lake & Westwood 700 DP	22435	7776	23653	8857
2	Como Lake & Westwood 420 DP	15781	8369	17753	9533
3	Poirier & Grover	7551	4094	8523	4663
4	Clarke & Robinson	13677	5748	15247	6547
5	Broadway & Underhill	11952	2625	13062	2900
6	Aubrey & Arden	5543	2674	6174	2953
7	University Dr E & Tower Rd	912	213	1017	236
8	Bainbridge & Broadway	6997	2460	7728	2717
9	Springer & Broadway	15570	4957	17219	5474
10	Springer & Empire	5813	2484	6443	2743
11	2nd & Boundary	15436	5937	16908	6557
12	Kootenay & Dundas	5222	2362	5532	2491
13	N.E. 2nd Narrows	6937	2501	7198	2639
14	Mt. Seymour & Lytton	10842	4395	11381	4638
15	Keith & Brooksbank	20100	8815	21109	9302
16	6th & St. Andrews	9613	3505	10075	3699
17	6th & Mahon	16418	3563	17176	3760
18	29th & Jones	14065	5738	14788	6055
19	15th & McGuire	4237	4156	4431	4385
20	Capilano & Marine	11731	2720	12259	2870
21	11th & Mathers	11191	3435	11729	3625
22	22nd & Mathers	5767	2410	6082	2543
23	Westmount & Rockview	9220	3092	9724	3263
24	2nd & Slocan	19468	7905	20558	8336
25	2nd & Woodland	51709	9911	54460	10452
26	6th & Quebec	48296	8119	49991	8562
27	5th & Fir 420 DP	32109	1475	33403	1556
28	5th & Fir 700 DP	28414	10857	30118	11451
29	5th and Pine	16744	2524	17711	2662
30	29th and Slocan 700 DP	10727	6036	19167	11782
31	29th & Nanaimo	18271	7547	19320	7960
32	37th & Prince Albert	21357	9885	22593	10425
33	37th & Ontario	5669	2629	5979	2772
34	37th & Heather	11661	2795	12302	2948
35	37th and Pine 700 DP	35075	13127	36773	13844
36	50th & Vivian	8428	3290	8896	3470
37	Marine and Elliot 700 DP	28205	22637	28831	19329
38	Marine & Elliott 420 DP	24723	9635	26155	10161

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6.1.2 Please confirm that the annual load forecast is consistent with the forecast used for revenue requirements purposes, or explain otherwise.

**Response:**

The peak hour load forecast used in assessing the capacity of the alternatives is consistent with the annual load forecast used for revenue requirement purposes from the perspective that it is built from the same account forecast. In the peak hour demand forecast, the annual accounts are multiplied by use per customer values derived as described in the response to BCUC IR 1.5.1 to determine the annual load additions.

6.2 Please provide the forecast annual, design peak day or design peak hour (as appropriate) loads and number of customers for customers served off the Fraser Gate station to Coquitlam Gate station IP system, which FEI forecasts will be required at the end of the 20-year planning period.

**Response:**

Under design peak hour conditions for 2034-35 the forecast load and number of customers served off the FEI Metro IP system are:

Design Peak Hour Load (std. m <sup>3</sup> /hour)	Customers Served
654,900	228,157

6.3 At present how many customers can be served from the Coquitlam line only without Fraser Gate support?

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**Response:**

Under peak hour demand, and in the absence of Fraser Gate supply, the customers served from the District Stations west of Springer Ave in Burnaby would be unable to receive sufficient inlet pressure to maintain delivery at the necessary rate into the local distribution systems. Approximately 171,000 customers served through those stations would lose delivery pressure sufficient to operate their gas appliances. The remaining 41,400 customers served off of the eastern portion of the Metro IP system would retain service.

6.4 At present how many customers can be served from the Fraser Gate line only without Coquitlam Gate support?

**Response:**

Under peak hour demand, and in the absence of Coquitlam Gate supply, the customers served from the Gate Stations east of the laterals to the 2nd Narrows Crossing would be unable to receive sufficient inlet pressure to maintain delivery at the necessary rate into the local distribution systems. Approximately 41,400 customers served through those stations would lose delivery pressure sufficient to operate their gas appliances. Approximately 171,000 customers would retain service.

6.5 Please provide a diagram showing the current design peak load and number of customers at each location where gas is delivered from the IP system to the Distribution system, which FEI forecasts will be required at the end of the 20-year planning period.

**Response:**

Please refer to the diagram and table in the response to BCUC IR 1.6.1.1.



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6.6 Please explain all assumptions used to project the current load forecast to the end of the 20-year planning period.

**Response:**

To provide context for the assumptions made, a brief description of the process follows. The load forecast applied to the Metro IP system was derived from the peak hour use per customer (UPC) numbers determined from the annual load gather process described in the response to BCUC IR 1.5.1. From the current design model of the Metro distribution system, the current station load for each station is extracted into a 20 year station load table.

The stations are organized by community and the proportion of the community load represented by each station is determined. Each community's annual load increment is determined by summing the product of each core rate class' account additions forecast for that year by the regional UPC for that rate class. It is assumed the UPC values remain constant over the planning period.

The account additions forecast is determined per each rate class for residential and commercial customers. The residential forecast depends on the Conference Board of Canada's housing starts where the commercial additions are largely based on a time series through an extrapolation of the latest trend.

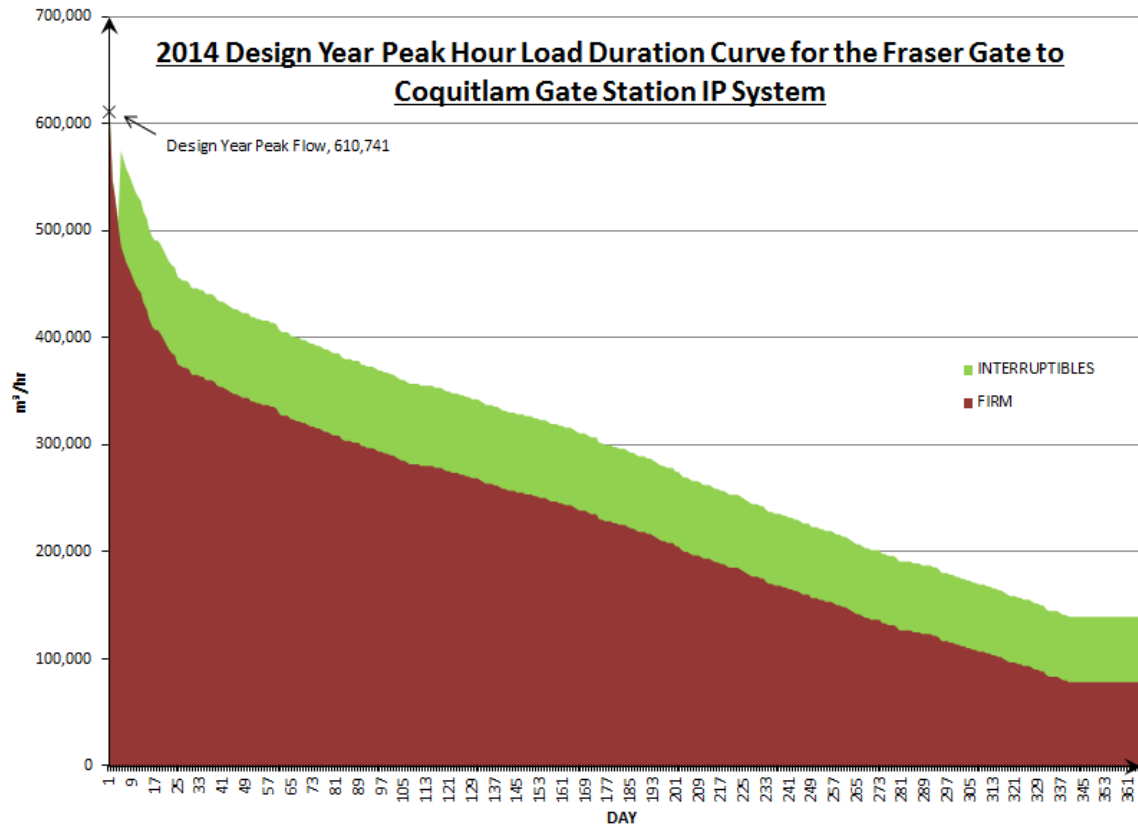
Load is applied each year to each station in the community in proportions described above and this proportional distribution is assumed constant over the planning period. Because of the unpredictability of forecasting the location and magnitude of large industrial load additions, no load forecast is applied to the 20 year load table for these customers.

6.7 Please provide a Load Duration Curve for the Fraser Gate station to Coquitlam Gate station IP system now and at the end of the 20-year planning period, which shows the expected daily or hourly loads for each day of a design year.

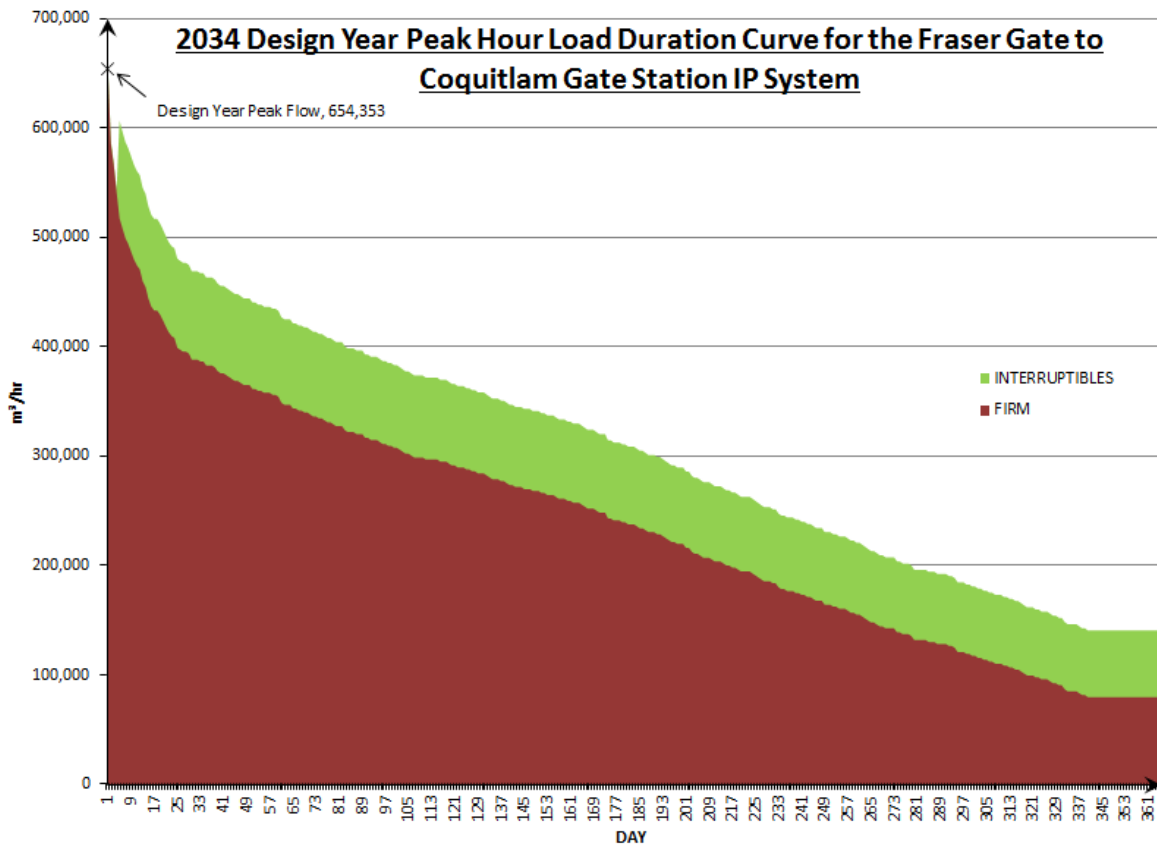
**Response:**

Below are Design Year peak hour Load Duration Curves for 2014 and projected to the end of the 20-year planning window. Note the presence of the demand for interruptible rate classes is shown, but for design purposes are removed at day 1-4 as the peak hour capacity of facilities is only designed to meet firm demand.

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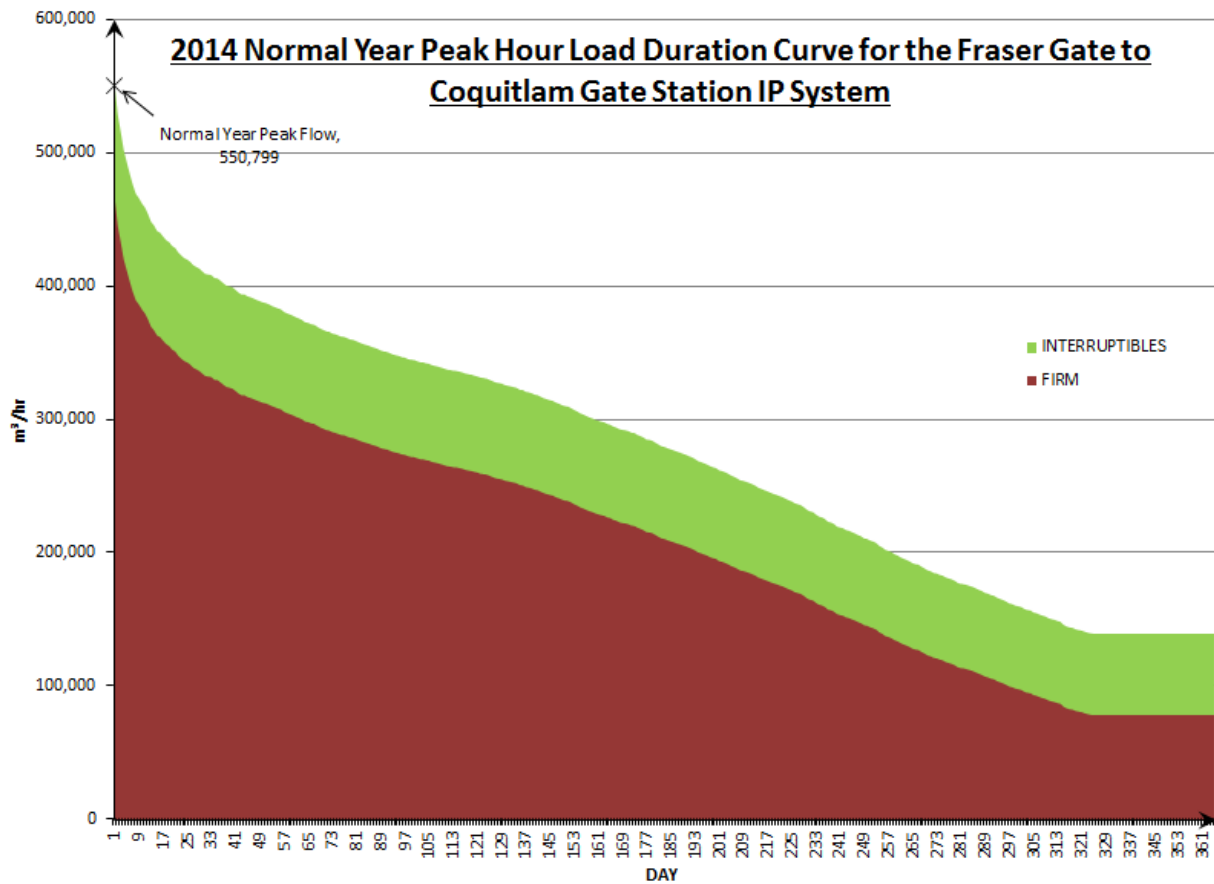


6.8 Please provide a Load Duration Curve for the Fraser Gate station to Coquitlam Gate station IP systems now and at the end of the 20-year planning period, which shows the expected daily or hourly loads for each day of an average year.

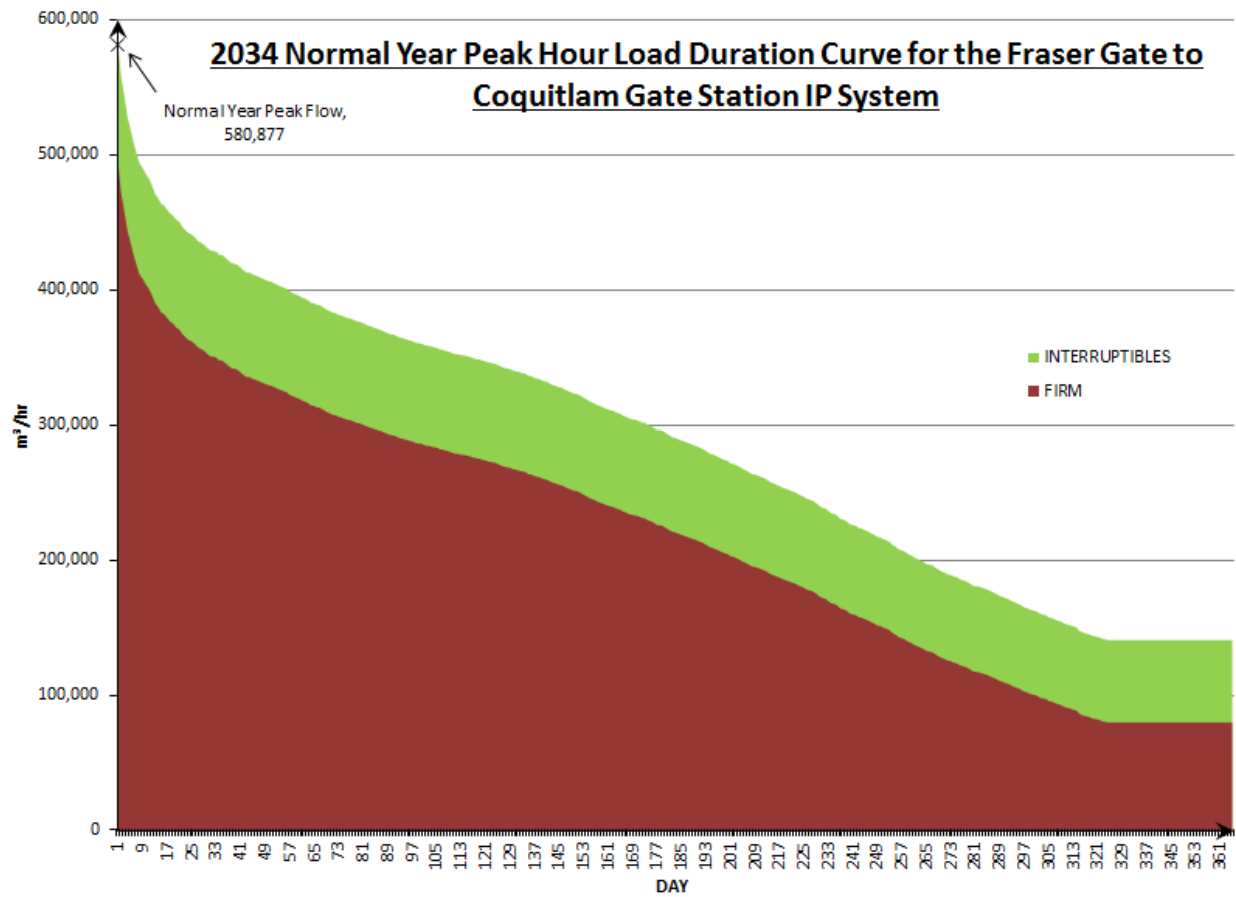
**Response:**

The requested Normal Year Load Duration Curves are provided below. Interruptible rate classes are shown as the peak hour demand with interruptible demand does not exceed design peak capacity in a normal year.

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## 7.0 Reference: Alternatives Description

### Exhibit B-1, Section 3.2.2, pp. 31–34

#### Life Extension of NPS 20 Pipeline

On pages 31 to 34, the utility describes Alternative 1 (Status Quo of Continuing Ongoing Integrity and Leak Management) and Alternative 2 (Rehabilitate the Existing Coquitlam Gate IP Pipeline).

7.1 Please provide a forecast for at least the next 20 years of annual O&M expenses and total annual cost of service (revenue requirements) for the NPS 20 pipeline under Alternative 1, the status quo option. Please justify the annual O&M forecasts.

#### Response:

FEI does not consider the status quo option of continued leak detection and repair as an appropriate or reasonable solution for the NPS 20 Coquitlam Gate IP pipeline due to FEI's assessment that the Coquitlam Gate IP pipeline is nearing the end of its useful life and requires replacement as discussed in the response to BCUC IR 1.2.2.

Although not a feasible alternative, FEI believes it has sufficient information available to respond to this question with an appropriate degree of effort. It is also important to note that the base O&M embedded in the PBR formula does not account for the forecast level of O&M that would be incurred in the absence of this Project as discussed in the response to BCUC IR 1.24.1.

The following Tables 1 and 2 provide an incremental O&M forecast for the next 20 years for the NPS 20 pipeline under Alternative 1, the status quo option. The estimate is based on the following assumptions.

- The cost to repair a leak is the average actual cost (\$107,902) to repair the leaks that occurred in the 2010 to 2014 time period;
- The frequency of leaks will increase at the rate outlined in Appendix A-1 of the Application; and
- The rate of inflation is estimated at 2% per year.

**Table 1**

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
O&M \$million	1.3	1.5	1.6	1.8	1.9	2.1	2.2	2.4	2.6	2.9

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**Table 2**

Year	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
O&M \$million	3.1	3.4	3.7	3.9	4.2	4.5	4.8	5.2	5.5	5.8

The total approximate annual cost of service (revenue requirements) for the NPS 20 pipeline under Alternative 1, the status quo option for the 20 year period starting in 2016 is as outlined in the following Tables 3 and 4.

**Table 3**

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Annual Revenue requirements \$million	1.1	1.3	1.4	1.6	1.7	1.9	2.0	2.2	2.4	2.7

**Table 4**

Year	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Annual Revenue requirements \$million	2.9	3.2	3.5	3.7	4.0	4.3	4.7	5.1	5.4	5.7

The revenue requirement impact is less than the gross O&M because 12% of the O&M is capitalized into Rate Base and effectively recovered over approximately 65 years.

7.2 Noting that the leaks on the NPS 20 pipeline tend to be clustered on certain sections of the pipeline, please discuss whether the replacement (possibly with NPS 30 pipe capable of operating at 2070 kPa) of the sections of NPS 20 pipeline where leaks have been most evident would be a feasible and reasonable solution for the next several years.

**Response:**

FEI does not consider the replacement of sections of pipeline that have experienced clusters of leaks as an appropriate or reasonable solution for the NPS 20 Coquitlam Gate IP pipeline for

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the next several years. As discussed in response to BCUC IR 1.1.1.7 regarding the apparent clustering of leaks on certain sections of the pipeline, given sufficient time, it is expected that future leaks will be distributed along the entire pipeline length. This is based on systemic disbondment of the field-applied coating at girth welds (as discussed in response to BCUC IR 1.2.2), which in turn results in susceptibility of those pipe areas to active corrosion and leaks.

Therefore, locations of past clusters cannot be relied upon as an indicator of where future leaks may occur. In other words, replacement of sections of the NPS 20 pipeline where leaks have occurred in the past will only mitigate the risk of future leaks in the specific locations where the pipeline is replaced.

Other factors considered by FEI in its assessment of short replacement sections not being an appropriate or reasonable solution for the next several years include:

- A phased approach would not deliver resiliency until the existing pipeline was fully replaced, as discussed in the response to BCUC IR 1.4.1.2;
- A phased approach would result in an unnecessarily protracted and inefficient approach to project implementation:
  - The timeline would be extended well beyond the current proposed project lifecycle;
  - Planning, permitting, designing, routing and constructing short replacement sections of the existing NPS 20, even in lengths of 1 to 2 kilometres, would be challenging and inefficient given the complexities of executing such projects in an urban environment;
- Although FEI has not evaluated in detail, there may be potential engineering, routing or gas supply issues that could arise during tie-in of replacement sections to the existing pipeline;
- Section 37 (3) of the Oil and Gas Activities Act states that “A person who is aware that spillage is occurring or likely to occur must make reasonable efforts to prevent ...the spillage”. FEI has not identified mitigation activities, other than complete replacement of the Coquitlam Gate IP pipeline, which will prevent future leaks. As FEI is aware that non-replaced sections of the existing NPS 20 Coquitlam Gate IP pipeline will likely experience leaks in the future, a strategy other than complete replacement may be considered incongruent with the Oil and Gas Activities Act; and
- A phased approach could result in multiple service disruptions to customers as the pipeline would be shutdown with each section replacement.



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7.2.1 If FEI were to replace three or more relatively short sections of the NPS 20 pipeline where leaks have been most evident, which sections would it replace and what would be the capital cost of the replacement?

**Response:**

FEI notes that the question focuses on the “sections [...] where leaks have been most evident”. As further discussed in the responses to BCUC IRs 1.1.1.7, 1.2.2 and 1.7.2, FEI reiterates that the corrosion mechanism has been confirmed along the entire length of the pipeline. Therefore, replacing only relatively short sections is not appropriate as it does not resolve the underlying corrosion mechanism along the entire length of the pipeline. On that basis, no associated capital cost estimate has been developed.

7.2.2 Please provide a *pro forma* forecast of additional pipeline sections that may also need to be replaced over the next 10 years.

**Response:**

As indicated in the responses to BCUC IRs 1.2.2, 1.7.2 and 1.7.2.1 FEI is not able to determine which sections along the 20 kilometre length may require replacement in the next 10 years. Further, FEI does not believe a piecemeal replacement strategy would allow it to safely and reliably supply gas to its customers.

7.2.3 Please provide a forecast of annual O&M expenses and total annual cost of service (revenue requirements) for the NPS 20 pipeline for at least the next 10 years under this alternative scenario.

**Response:**

Please refer to the response to BCUC IR 1.7.2.2.

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## 8.0 Reference: Alternatives Description

### Exhibit B-1, Section 1.3, p. 10; Section 3.2.2.6, p. 38

#### Capacity of IP System without Cape Horn to Coquitlam TP Loop

The utility states on page 38 that Alternative 6, its preferred alternative, will provide sufficient capacity to establish full system resiliency.

The utility states on page 10:

Until the Cape Horn to Coquitlam TP loop is constructed, sufficient operational flexibility will exist to permit planned maintenance and repair of the Fraser Gate IP pipeline during warmer times of the year.<sup>10</sup>

8.1 Without the Cape Horn to Coquitlam TP loop and assuming no supply from Fraser Gate station, on how many days of an average year would the proposed NPS 30 IP pipeline operating at 2070 kPa permit planned maintenance on the IP system, when the NPS 30 IP pipeline first goes into service?

#### Response:

In the first year of operation, without the Cape Horn to Coquitlam TP loop, FEI expects that with a normal year forecast there would be about 361 days that the Metro IP system could theoretically support an outage. On four days there would be insufficient inlet pressure provided by the transmission system for the proposed Coquitlam Gate IP pipeline to adequately support the Metro IP system without the support of Fraser Gate. The four coldest days are most likely to occur any time in the winter period between the weeks of early December to early February, so planned work would be excluded from this period without provision for bypass piping.

8.1.1 Please repeat the previous question for conditions at the end of the 20-year planning period.

#### Response:

At the end of the 20 year planning period, without the Cape Horn to Coquitlam TP loop, with a normal year forecast FEI expects there would be about 359 days that the Metro IP system could theoretically support an outage. On six days there would be insufficient inlet pressure provided by the transmission system for the proposed Coquitlam Gate IP pipeline to adequately support

<sup>10</sup> Exhibit B-1, p. 10.

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the Metro IP system without the support of Fraser Gate. The six coldest days are most likely to occur any time in the period between the late November to early February, so planned work would be excluded from this period without provision for bypass piping.

8.2 Without the Cape Horn to Coquitlam TP loop and at design peak conditions, when the NPS 30 IP line first goes into service what amount of load and how many customers would lose service in the event there are no deliveries from the Fraser Gate station?

**Response:**

In 2019, without the Cape Horn to Coquitlam TP loop and at design peak conditions, the transmission system would be unable to deliver about 122,000 of the 622,300 std m<sup>3</sup>/hour requirement at Coquitlam Gate to support all Metro IP customers in the event of no supply from Fraser Gate. With the NPS 30 IP Pipeline in place there is an opportunity in this scenario to avoid an uncontrolled low pressure outage across the system. This opportunity is not available in alternatives that do not have full resiliency. In the scenario considered, the load shift from Fraser to Coquitlam would drop the inlet pressure to the Eagle Mountain Compressor Station (serving Vancouver Island). An Eagle Mountain shut down would force Vancouver Island to sustain on line pack, which is possible for short periods of time at peak demand. When Eagle Mountain shuts down, the pressures in the CTS will rebound to a point sufficient to sustain the required inlet pressure at Coquitlam Gate. This allows feed to be maintained temporarily at full flow to the Metro IP system resulting in no customers lost initially. In order to restore supply to Vancouver Island the 122,000 std m<sup>3</sup>/hour would need to be curtailed from the Metro IP system to allow the transmission system to satisfy the minimum pressure constraints at both Eagle Mountain Compressor and Coquitlam Gate. This curtailment requirement would result in loss of approximately 45,000 customers on the Metro IP System.

8.2.1 Please repeat the previous question for conditions at the end of the 20-year planning period.

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1    **Response:**

2    In 2034, without the Cape Horn to Coquitlam TP loop and at design peak conditions, the  
3    transmission system would be unable to deliver about 154,900 std m<sup>3</sup>/hour of the 654,900 std  
4    m<sup>3</sup>/hour requirement at Coquitlam Gate to support all Metro IP customers in the event of no  
5    supply from Fraser Gate. Responding to an outage as described previously in the response to  
6    BCUC IR 1.8.2, this shortfall could result in loss of approximately 57,200 customers on the  
7    Metro IP System.

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11            8.3    Please state when FEI currently expects that the Cape Horn to Coquitlam TP  
12            loop will go into service and explain the basis for the statement.

13

14    **Response:**

15    FEI currently expects the Cape Horn to Coquitlam TP loop to go into service by Q4 2017 based  
16    on the Company's assessment of resources required for design, construction and other  
17    necessary activities to place the project in service.

18    Please note that the project is subject to Order in Council 749, Amendment to Special Direction  
19    No.5, received December 23, 2014.

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**9.0 Reference: Alternatives Description**

**Exhibit B-1, Section 3.2.2.4, pp. 35–36; Exhibit B-1-1, Appendix F**

**Capacity of NPS 24 Pipeline Operating at 2070 kPa**

The utility states on page 35 that this alternative is unable to supply sufficient back feed during the colder days of winter.

The Glossary of Terms in Appendix F defines Intermediate Pressure as 3,100 to 701 kPa.

9.1 With a 24 NPS pipeline from Coquitlam Gate station operating at 2070 kPa and assuming there is no supply from Fraser Gate station, at the end of the 20-year planning period how much load and how many customers would not be served at design peak conditions?

**Response:**

At the end of the 20 year planning period, under peak hour demand, and in the absence of Fraser Gate supply, the customers served from the District Stations west of the IP lateral on Arden Avenue in Burnaby, serving Simon Fraser University, would be unable to receive sufficient inlet pressure to maintain delivery at the necessary rate into the local distribution systems. Approximately 192,500 customers with a gas demand of more than 566,000 standard m<sup>3</sup>/hour served through those stations would lose delivery pressure sufficient to operate their gas appliances.

Please also refer to the response to BCUC IR 1.9.2 for additional discussion on the explanation for this pressure collapse.

9.1.1 At the end of the 20-year planning period, on how many days of an average year would a NPS 24 pipeline operating at 2070 kPa provide full system resiliency?

**Response:**

At the end of the 20-year planning period the NPS 24 pipeline operating at 2070 kPa could provide support to the full Metro IP system 353 days in a normal year. Sufficient backfeed could not be provided for 12 days of a normal year to provide full resiliency because of the limited capacity of the NPS 24 IP pipeline.

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9.2 Please discuss whether, in the absence of the Cape Horn to Coquitlam TP loop, a NPS 24 pipeline operating at 2070 kPa would provide substantially as much operational flexibility and system resiliency as the proposed NPS 30 pipeline.

**Response:**

This response provides a more expansive explanation than sought in the Information Request, but FEI believes the additional information will add clarity needed to explain the selection of the preferred NPS 30 (2070 kPa) alternative over the NPS 24 (2070 kPa) alternative. This response also provides context for the responses to BCUC IR 1.9.1 and CEC IRs 1.30.2 and 1.30.3.

FEI does not consider the NPS 24 (2070 kPa) alternative comparable to the proposed NPS 30 (2070 kPa) alternative. With or without the Cape Horn to Coquitlam TP loop under peak hour demand, the NPS 24 pipeline alternative, similar to the other alternatives that do not meet the full resiliency requirement, would suffer a collapse in downstream pressure as the gas flows away from Coquitlam Gate station. This would cause a higher number of customer outages.

It should be noted that while NPS 30 pipe is only 25% larger in diameter than NPS 24 pipe, it has almost a 60% greater cross-sectional area – and consequently a much higher flow capacity. The gas velocity in the NPS 24 or smaller pipelines is therefore much higher than the NPS 30 pipeline under peak hour flow and this contributes to an even higher rate of pressure drop as the gas moves along the pipeline. An additional challenge for the pipeline is that almost 90% of the gas leaving Coquitlam Gate heading west has to travel more than 15 km – or three-quarters of the length of the pipeline – before reaching the major laterals and District Stations in the vicinity of East 2<sup>nd</sup> Ave. & Boundary Road and west to distribute the gas to Vancouver and the North Shore communities. This combination of sustained higher velocities over long distance exceeds the ability of the NPS 24 and smaller pipelines to offer the full resiliency provided by the proposed NPS 30 IP pipeline.

The proposed NPS 30 pipeline would be considered to have more resiliency than the NPS 24 pipeline even in the absence of the Cape Horn to Coquitlam TP loop. As described in the response to BCUC IR 1.8.2.1, under peak hour demand at the end of the 20 year planning period, the NPS 30 pipeline would require shutdown of up to 57,200 customers and if required, could be done in a controlled manner as described in the response to BCUC IR 1.8.2. Under the same peak hour conditions, with or without the Cape Horn to Coquitlam TP loop, the NPS 24 pipeline the Metro IP system would have up to 192,500 customer outages as described in the response to BCUC IR 1.9.1.

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At the end of the 20 year planning period the NPS 30 pipeline would allow operational flexibility to shift all load from Fraser Gate to Coquitlam Gate for all but the 6 coldest days in a normal year, the transmission system being limited because of the absence of the Cape Horn to Coquitlam loop. With the CTS loop the NPS 30 pipeline provides year round resiliency.

9.3 Please discuss the feasibility of an upgrade alternative using 24 NPS pipe operating at 3100 kPa.

**Response:**

An IP system operating at pressure above 2070 kPa (300 psig) would not be feasible in the Lower Mainland area. The Coastal Transmission System (CTS) is supplied at Huntingdon Gate where the contract minimum supply pressure from Spectra Energy is 3440 kPa (500 psig). As a result the CTS must be designed to deliver the peak demand requirements at the minimum supply pressure of 3440 kPa. Operating an IP system at 3100 kPa (450 psig) supplied by the CTS would provide insufficient pressure differential from the contract minimum supply pressure at Huntingdon Gate to maintain adequate working pressure through the CTS to the Coquitlam TP/IP Gate station.

Furthermore, operating an IP system above 2070 kPa would require heating of the gas at all offtake points to counteract the cooling effect associated with pressure reduction. Heating of gas in this manner is only applied at the Coquitlam Gate and Fraser Gate stations where there is sufficient space to accommodate the heating equipment. The offtake points along the Coquitlam Gate IP and Fraser Gate IP pipelines supply district stations (small underground vaults) containing pressure control equipment that is designed to operate without gas heating. Therefore, the maximum inlet pressure must be restricted to mitigate the risk of freezing. Inlet pressures above 2070 kPa would increase the risk of equipment malfunction due to freeze-up.

9.3.1 Please discuss whether this alternative would provide full system resiliency at the end of the 20-year planning period.

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**Response:**

For the reasons outlined in the response to BCUC IR 1.9.3, a 3100 kPa system would not be feasible because of the inability to maintain adequate inlet pressure from the transmission system upstream of Coquitlam Gate station.

9.3.2 If FEI considers that a NPS 24 pipeline operating at 3100 kPa is not an appropriate upgrade for this IP system, please explain fully the reasons for this position.

**Response:**

Please refer to the response to BCUC IR 1.9.3.

9.3.3 If there are code requirements that prevent an upgrade to this IP system from operating above 2070 kPa, please identify and explain them.

**Response:**

FEI is not aware of code requirements that would prevent an IP system upgrade to greater than 2070 kPa. However, the Company has operating constraints on the coastal transmission system upstream pressure that would prevent the possibility of upgrades operating at higher than 2070 kPa on the Metro IP system. Exhibit B-1 section 3.3.3.1 outlines that the design, construction and operation of FEI natural gas pipelines and stations are conducted in accordance with BC OGC regulations and the Canadian Standards Association (CSA) Standard Z662 "Oil and Gas Pipeline Systems". Further to this standard the Coquitlam Gate IP Project, comprising both pipeline segments and stations, will be developed in accordance with FEI's internal standards.



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9.3.4 If cooling at the points of delivery to the DP system is a constraint, please explain the concern and describe how it is dealt with on other IP systems that operate at pressures greater than 2070 kPa.

**Response:**

Please refer to the response to BCUC IR 1.9.3.

9.3.5 Please identify the maximum feasible operating pressure for an upgrade to the Coquitlam Gate IP system, and explain the criteria and circumstances that establish the maximum.

**Response:**

FEI has determined 2070 kPa to be the maximum feasible operating pressure for an upgrade to the Coquitlam Gate IP system. Please refer to the response to BCUC IR 1.9.3 for the criteria that establishes this maximum.

9.3.6 Please provide a cost estimate for a NPS 24 pipeline operating at 3100 kPa (or, if necessary, at a pressure between 2070 and 3100 kPa) to replace the existing Coquitlam Gate IP pipeline.

**Response:**

Please refer to the response to BCUC IR 1.9.3.

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**10.0 Reference: Alternatives Description**

**Exhibit B-1, Sections 3.2.2.5, 3.2.2.6, pp. 36–39**

**Capacity of NPS 30 Pipeline Operating at 1200 kPa**

On page 38, the utility states a NPS 36 pipeline operating at 1200 kPa would not provide full resiliency and could result in loss of supply to approximately 47,500 customers on colder days.

10.1 With a 30 NPS pipeline from Coquitlam Gate station operating at 1200 kPa and assuming no supply from Fraser Gate station, at the end of the 20-year planning period how much load and how many customers would not be served at design peak conditions?

**Response:**

Under peak hour demand, and in the absence of Fraser Gate supply, the customers served from the District Stations west of and including the Broadway and Underhill District Station in Burnaby would be unable to receive sufficient inlet pressure to maintain delivery at the necessary rate into the local distribution systems. Approximately 198,500 customers with a gas demand of more than 586,300 standard m<sup>3</sup>/hour served through those stations would lose delivery pressure sufficient to operate their gas appliances causing widespread unpredictable outages in the service area.

10.1.1 At the end of the 20-year planning period, on how many days of an average year would a NPS 30 pipeline operating at 1200 kPa provide full system resiliency?

**Response:**

An NPS 30 pipeline operating at 1200 kPa would not provide full system resiliency as the term has been defined in the Application, either on the proposed in service date of 2019 or at the end of the planning period. FEI has defined full resiliency in the Application as the capacity required to meet peak demand conditions, and operational flexibility as the capacity required to meet off-peak conditions. The NPS 30, 1200 kPa pipeline would provide operational flexibility for a portion of the year.

Please also refer to the response to BCUC IR 1.10.1.2.

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10.1.2 Please discuss whether this amount of resiliency would provide sufficient operational flexibility to carry out scheduled maintenance on the Coquitlam Gate to Fraser Gate IP system.

**Response:**

The operational flexibility provided by an NPS 30 IP pipeline operating at 1200 kPa would allow a window for maintenance work requiring isolation that would extend from approximately the week of April 22 to the week of October 14. This window would provide opportunities to carry out planned work, but would, for example, not permit the tie in of the Fraser Gate IP Pipeline in November 2019 as proposed without requiring bypass piping installed to maintain supply from Fraser Gate. Such work would need to be deferred into the following summer to be done without requiring bypass piping to be installed.

10.1.3 Please provide an AACE Class 4 cost estimate for a NPS 30 pipeline operating at 1200 kPa.

**Response:**

Further time, resources and detail would be required to complete an AACE Class 4 level estimate for this alternative. However, based on the Class 3 cost estimate prepared for the NPS 30 pipeline operating at 2070 kPa, an order of magnitude cost for the NPS 30 Coquitlam Gate IP pipeline operating at 1200 kPa is estimated at approximately \$180 million (2014\$).

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**11.0 Reference: Coquitlam Gate IP**

**Exhibit B-1, Section 3.3.3.3, pp. 58–59**

**Pipeline Coating and Design**

11.1 Was repair or replacement of the pipeline coating considered before deciding on pipeline replacement? If yes to what level of detail, if not why not?

**Response:**

Confirmed. Repair or replacement of the pipeline coating was considered before deciding on pipeline replacement. The evaluation of this alternative is included in the Application as Alternative 2. Please refer to section 3.2.2.2 (page 33) of the Application.

11.2 For alternatives 4 through 7 please provide the potential peak supply.

**Response:**

FEI interprets this Information Request to request the delivery capability for Alternatives 4 – 7. The following table shows the relative capacity of the pipelines to a uniformly applied decrease or increase in system loading while maintaining a minimum system design pressure at the weakest point of the system without the support of Fraser Gate. Alternatives that can deliver less than the full demand requirement for 2014, such as Alternatives 4 and 5, would result in customer outages under peak conditions if these pipeline alternatives were presently in service. Also note that as demand increases beyond the delivery capability of the pipeline, a pressure collapse occurs, and the low pressure area grows in size, moving further upstream with increasing demand, resulting in lower and lower numbers of customers receiving sufficient delivery pressure from the system. Potential Customer impact numbers for these alternatives under peak demand in the first year of service, 2019, are also shown in the table below.

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**Pipeline Capacity Comparison Table**  
**Alternatives 4 through 7**

IP Pipeline	Fraser Gate Supply	Coquitlam Gate Supply	% of 2014 Peak Hour Demand	Pipeline flow* (std. m3/hr)	Estimated Customer outages under peak demand 2019
Alternative 4 - NPS 24 Pipeline at 2070 kPa	off	on	77.30%	435,600	181,200
Alternative 5 - NPS 36 Pipeline at 1200 kPa	off	on	90.70%	544,700	48,000
Alternative 6 - NPS 30 Pipeline at 2070 kPa	off	on	125.00%	726,600	0
Alternative 7 - NPS 42 Pipeline at 1200 kPa	off	on	129.00%	770,100	0

\* as Metro IP system reaches min design pressure constraint

11.3 Do any of the alternatives considered for the Coquitlam line take seismic risk into consideration? If so, how? If not why not?

**Response:**

FEI actively reviews its pipeline assets for seismic vulnerability, as this is a key component of FEI's Integrity Management Plan. FEI assessed the section of the Fraser Gate IP at the outlet of the Fraser Gate station as not meeting FEI's seismic requirements. The existing Coquitlam Gate IP pipeline has not been identified as seismically vulnerable. As the proposed replacement NPS 30 IP pipeline route is along the same corridor, the conceptual engineering considers the seismic risk to be low. However, as per the requirements of CSA Z662 and FEI design guideline DES 09-02, pipeline design must include seismic loading. Seismic hazard analysis will be completed during the detailed design, and will depend on the outcome of the geotechnical site investigations.

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Pipeline coating is the first level of defense against corrosion. FEI states “Fusion Bonded Epoxy (FBE) has been selected as the most appropriate coating for the Coquitlam line”<sup>11</sup>

11.4 Please explain what analysis was carried out to determine this was the best type of coating for the proposed pipeline.

**Response:**

The selection of coating was selected based on FEI’s internal standard DES 08-05 “Protective Coatings for Buried Steel Piping”, and is currently the only approved plant-applied coating for line pipe of NPS 24 and greater.

For large diameter pipelines, FBE is the most cost effective and widely used pipeline coating material. FBE is factory applied under strict quality control practices as required by CSA Z245.20 Plant Applied External Fusion Bond Epoxy Coating for Steel Pipe. FBE coatings are considered “fail safe” as they will not shield cathodic protection current in the case of potential coating damage, deterioration, or loss of adhesion.

The field applied coating will be 100% solids liquid applied epoxy. This coating material has equivalent performance properties to those of the factory applied FBE. Epoxy coatings will not shield cathodic protection in the case of coating damage, deterioration, or loss of adhesion.

11.4.1 What, if any, other coatings were considered? Please provide a technical and financial cost comparison of all alternatives considered.

**Response:**

FBE is currently the only approved plant-applied coating for line pipe of NPS 24 and greater per FEI internal standard.

Other industry accepted options for large diameter pipelines include three layer polyolefin coating systems, which are typically two to three times the cost of FBE in order of magnitude. In addition, polyolefin materials are not resistant to hydrocarbon deterioration, which is recognized as a potential risk along the route alignment corridor.

FEI’s internal standard for field-applied girth weld coating recognizes two options, namely the 100% solids liquid applied epoxy and a non-shielding wrapping tape. FEI has identified the

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<sup>11</sup> Exhibit B-1, p. 58.

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epoxy coating at girth welds as preferred from a long-term coating performance perspective.  
Cost impact to the project is expected to be insignificant between these two choices.

Please also refer to the response to BCUC IR 1.11.4.

FEI states “It is expected that the existing CP system could be used to provide protection to the new Coquitlam gate IP Pipeline”<sup>12</sup>

11.5 Please confirm, otherwise explain, that FEI has carried out an inspection on the condition of the current CP system.

**Response:**

FEI conducts periodic inspections of its entire cathodic protection (CP) in accordance with CSA Z662 and FEI internal standards. The last inspection of the CP system was conducted in November 2014. The CP system for the existing NPS 20 Coquitlam Gate IP pipeline is in satisfactory condition and has sufficient capacity to provide cathodic protection to the new NPS 30 pipeline.

Please also refer to the response to BCUC IR 1.11.6.

11.6 Please confirm, otherwise explain, that, in the event that the CP system needs to be replaced, FEI has accounted for this in the project cost estimate. If not, please provide an estimate of this cost and update the project cost estimate accordingly.

**Response:**

The existing CP system is not expected to require replacement and therefore FEI has not accounted for the potential cost of CP system replacement in the project cost estimate. Detailed engineering decisions, including final route selection, will impact the ability to leverage the existing CP system. Proximity of the new NPS 30 pipeline from existing cathodic protection assets will be a primary influencing factor.

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<sup>12</sup> Exhibit B-1, p. 59.

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The CP system current requirements for a new, well coated pipeline are typically significantly less than the requirements for an older pipeline with potentially degraded or damaged coating. This reduces the likelihood that incremental CP facilities will be required for the new NPS 30 pipeline despite final route selections.

A new anode bed, if considered necessary during detailed engineering, would be expected to cost approximately \$50,000. This cost may vary depending on specific requirements. If required, such costs would be addressed through a project scope change and absorbed in the project contingency.

11.7 FEI's plan is to abandon the current NPS 20 in place once the new pipeline is in service. Please show the cost of pipe removal in comparison to all costs associated with abandonment of the asset – including the associated ROW cost, environmental, safety cost, etc ...

**Response:**

A high-level, order of magnitude cost estimate for removal of the existing NPS 20 pipe is \$75 million comprising excavation, disposal of excavated material, cutting and removal of pipe, disposal of pipe, backfilling and finishing. There would be no ROW costs incurred.

This compares to \$3.1 million included in the Project Class 3 estimate for pipeline abandonment.

11.7.1 Please describe the adverse effects abandoning the pipe in the situ will have on future space restrictions, access to ROW's, and long-term environmental effects.

**Response:**

FEI has selected abandonment of the NPS 20 Coquitlam Gate IP pipeline as the least impact end-of-life solution as further explained below. When carrying out abandonment, FEI will identify, manage and mitigate the potential environmental, public or stakeholder legacy issues. FEI does not foresee any significant adverse effects as a result of abandoning the pipeline in place.



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1 It should be noted that gas flow in the existing NPS 20 pipeline must be maintained to supply  
2 customers while the NPS 30 pipeline is constructed and commissioned. Therefore, it is not  
3 possible to remove the existing NPS 20 IP pipeline prior to, or in conjunction with, the  
4 construction and installation of the proposed NPS 30 IP pipeline. After commissioning of the  
5 NPS 30 IP pipeline, the existing NPS 20 will be decommissioned, degassed and disconnected  
6 from the Metro IP system. If the NPS 20 were then removed, the impact from the construction  
7 and removal would be similar to constructing a second 20km pipeline through the same  
8 communities; therefore, leaving the NPS 20 in place is the least impact solution. Abandonment  
9 of gas pipelines is governed by CSA Z662 and FEI internal standard DES 04-01-10. This is an  
10 industry accepted process for end-of-life pipeline assets.

11 In the response to CEC IR 1.45.1, FEI provides an assessment of potential environmental  
12 impacts as noted by the Det Norske Veritas "Pipeline Abandonment Scoping Study" prepared  
13 for the National Energy Board in 2010.

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17 11.7.2 For how long does FEI retain data on abandoned pipes?  
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19 **Response:**

20 FEI retains critical records for the duration of the asset's physical existence plus twenty-five  
21 years. Should an asset be physically removed or sold, the records are maintained for 25 years.  
22 Critical records include all as-built drawings, maps, specifications, inspections, and other data  
23 related to the design, construction, and commissioning of gas system assets.

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**12.0 Reference: Coquitlam Gate IP**

**Exhibit B-1, Section 3.3.3, 3.3.3.2.3, 3.3.3.2.4, pp. 48, 51–52**

**Project Description**

On pages 51 and 52 FEI explains integration of a new pipeline with the exiting gas distribution system. FEI explains that in some situations district stations or industrial load are located remotely.<sup>13</sup>

12.1 Please confirm, otherwise explain, that the costs for connecting to remotely located district stations or industrial loads have been considered in the overall project cost. If not confirmed, please explain why not.

**Response:**

Confirmed.

12.1.1 Please elaborate on the accuracy of the cost estimates associated with situations where the district stations or industrial load are remotely located and discuss any associated cost risk.

**Response:**

The connection of district stations or industrial loads located remotely to the NPS 30 IP pipeline is detailed in FEI's Application (Exhibit B-1) Section 3.3.3.2.3 (Integration with Existing Gas Distribution System). Where stations or loads are located remotely, the existing lateral supply pipelines will be connected to the new NPS 30 IP pipeline via IP/IP interface stations. The cost estimate for the IP/IP stations is prepared to AACE Class 3 level of accuracy. The location of the IP/IP station sites will be confirmed during detailed design when the exact configuration of the tie-in pipework and equipment will be defined. There is a minor risk that the final location of the IP/IP interface station could impact the final tie-in design scope. The quantitative risk analysis completed for this project includes a risk allocation for scope variances related to the design and construction of these stations which is reflected in the project contingency.

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<sup>13</sup> Exhibit B-1, p. 51.

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FEI states "The pipeline will be constructed and installed predominantly within existing road allowances."<sup>14</sup>

12.2 Has future densification of urban areas been considered in the pipeline design and routing? If so, how? If not, why not?

**Response:**

Yes, densification of urban areas has been considered in the pipeline design and routing. The pipeline will be designed to Clause 12 of CSA Z662 which covers requirements specific to gas distribution systems. The pipeline will operate at a low stress level with a corresponding high factor of safety suitable for urban locations. Also, the pipeline route is located mostly within road allowance which will mitigate risk of future impact to adjacent development and densification. Furthermore, during the routing process, FEI has engaged with the municipalities along the route corridor to present the proposed alignment and inform the routing process with respect to long term municipal development plans which could impact route selection.

12.3 Section 3.3.3.2.4 describes the interface changes required at East 2nd and Woodland. Please confirm, otherwise explain, that building permits, if required, are secured for the proposed buildings at East 2<sup>nd</sup> and Woodland terminus.

**Response:**

The detailed station design, which will include any buildings required at East 2<sup>nd</sup> and Woodland, has not yet been completed. The building permits will require this level of design definition to be included prior submission and therefore the building permits have not yet been acquired.

12.3.1 Please confirm, otherwise explain, that neighborhood residents have been informed of the proposed buildings required to accommodate the proposed pipeline upgrade.

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<sup>14</sup> Exhibit B-1, p. 48.

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1 **Response:**

2 Neighbourhood residents within 200 metres of the existing pipeline have been advised of the  
3 proposed pipeline upgrades through mail-outs that included an invitation to attend public  
4 information sessions, as well as advertisements in community and daily newspapers. While  
5 these materials did not specifically mention the details of building requirements at station  
6 locations, these details were discussed verbally with those who attended the public information  
7 sessions.

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**13.0 Reference: Basis of Design and Engineering**

**Exhibit B-1, Section 3.3.3, pp. 48–53**

**Upgrades at Coquitlam Gate, IP Laterals and Connection to Fraser Gate IP Pipeline**

The utility states on pages 51 to 53 that upgrades will be needed at the Coquitlam Gate station, connections to IP lateral off-takes and the interface with the Fraser Gate NPS 30 IP pipeline to accommodate the higher flow rates and the higher 2070 kPa operating pressure of the proposed NPS 30 Coquitlam IP pipeline.

13.1 Please confirm that, after the proposed upgrade, the Coquitlam Gate station will be able to deliver gas to portions of the IP system at 1200 kPa as well as at 2070 kPa.

**Response:**

Confirmed. Control valves will be installed in Coquitlam Gate station which will have the necessary functionality to deliver gas at 1200 kPa to the Coquitlam Gate IP pipeline. Also, each station connected to the NPS 30 Coquitlam Gate IP pipeline will be designed to meet capacity requirements and accommodate the range of inlet pressures that would occur whether the system was fed from Fraser Gate at 1200 kPa or Coquitlam Gate at 1200 kPa to 2070 kPa.

13.2 Please provide a cost estimate for an upgrade to the Coquitlam Gate station that would handle the higher flow rate while delivering gas to the IP system only at the current 1200 kPa.

**Response:**

No upgrade is required to the existing Coquitlam Gate Station for this alternative if the intent of the question is to consider a station upgrade supporting a new NPS 30 IP pipeline designed to operate at 1200 kPa. Therefore, FEI has not provided a cost estimate for an upgrade.

The reason no upgrade is required is as follows:

In the event of a failure at Fraser Gate station, an NPS 30 Coquitlam IP pipeline operating at 1200 kPa has the capacity to deliver just over 350,000 standard m<sup>3</sup>/hour before low delivery pressures in the western portions of the Metro IP system begin to result in customer outages. Coquitlam Gate station currently has capacity to deliver in excess of 350,000 standard m<sup>3</sup>/hour

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at 1200 kPa and is not the constraint in this scenario. The capacity constraint would be a result of the NPS 30 Coquitlam Gate IP pipeline operating at 1200 kPa pipeline not the Coquitlam Gate station. Therefore, an upgrade to the station would not be considered necessary in this scenario. Note: the peak demand on the Metro IP system at the end of the 20-year planning horizon is approximately 655,000 standard m<sup>3</sup>/hour which is much higher than the Coquitlam Gate IP pipeline can deliver if designed to operate at 1200 kPa. There would be no requirement to upgrade the Coquitlam Gate station to deliver 655,000 standard m<sup>3</sup>/hour because the pipeline would only be able to deliver 350,000 standard m<sup>3</sup>/hour.

13.3 Please provide the estimated cost of the upgrades for integration with the existing distribution system as described in sub-section 3.3.3.2.3.

**Response:**

The estimated cost of the upgrades for integration with the existing distribution system as described in Exhibit B-1 Section 3.3.3.2.3 is \$4.213 million (2014\$).

13.3.1 Please confirm that this expenditure would not be required if the new Coquitlam IP pipeline operated at the current 1200 kPa, or explain otherwise.

**Response:**

Confirmed.

13.4 Please confirm that the expenditure associated with the interconnections with the Fraser Gate NPS 30 IP as described in sub sections 3.3.3.2.4 and 3.3.3.2.5 would not be required if the new Coquitlam IP pipeline operated at the current 1200 kPa, or explain otherwise.



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1 **Response:**

2 Confirmed.

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**14.0 Reference: In-Line Inspection (ILI)**

**Exhibit B-1, Section 3.3.3.3.5, p. 58**

**Feasibility of ILI Capability**

The utility states on page 58 that it is appropriate to design the proposed NPS 30 Coquitlam IP pipeline to have future ILI capability.

14.1 Considering the relatively low pressures at which the pipeline will operate, please discuss whether suitable ILI tools are available and whether it will be feasible to undertake ILI on this pipeline when it goes into service or soon thereafter.

**Response:**

Although FEI has not run ILI tools in pipelines operating at these relatively low operating pressures (2070 kPa), there are now commercially available free-swimming and robotic ILI technologies capable of inspecting the proposed NPS 30 Coquitlam Gate IP pipeline. These are recent industry developments.

FEI believes it will be feasible to undertake ILI on this pipeline.

14.2 Considering the routing constraints in some areas, please discuss whether it will be feasible and not unduly costly to ensure that all pipeline bends have radii that are at least 3 to 5 times the pipeline diameter to accommodate ILI on this pipeline.

**Response:**

The manufactured bends for the NPS 30 Coquitlam Gate IP pipeline will be formed through a process involving induction heating of the same or similar pipe (starter material) to the pipeline itself, commonly referred to as 'induction bends'. Depending on the design wall thickness, the induction forming process has limitations on the minimum bend radius achievable, and in the case of the proposed design for this pipeline, could be in the range of three to five diameters. The feasibility of using such induction bends for directional change has been accounted for in the pipeline routing and the costs also included in the cost estimate prepared for this Project.

FEI considers it prudent to design the Coquitlam Gate IP pipeline to enable in-line inspection. In-line inspection (ILI) is a proven industry tool for proactive identification of sections of pipe that may require maintenance or replacement over time. To enable ILI, the pipeline design will



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1 include bends with a minimum radius of three times the pipe diameter, which can accommodate  
2 recently available ILI technology. Therefore, because the minimum acceptable bend radius for  
3 ILI is equal to or less than the minimum pipeline induction bend radius required for directional  
4 change, FEI considers the incremental cost to include ILI capability, in terms of pipeline bend  
5 requirements, to be immaterial.

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9 14.3 For the proposed 30 NPS pipeline, what is the estimated incremental as-spent  
10 cost of the larger radii pipeline bends and full bore block valves that FEI  
11 proposes to incorporate to facilitate ILI?  
12

13 **Response:**

14 The minimum pipeline bend radius to accommodate ILI is three times the pipe diameter. The  
15 current pipeline design conservatively includes induction bends with a design radius of  
16 five times the pipe diameter. The costs for these bend radii were included in the Project cost  
17 estimate for the pipeline. If it is possible to reduce the bend radii to three times the pipe  
18 diameter, there would be an approximate cost savings of 0.03% to the Project, based on the  
19 construction and supply of pipeline materials.

20 The block valves included in the pipeline design and Project cost estimate are full bore type  
21 valves. Full bore is required to facilitate unrestricted passage of pipeline cleaning pigs,  
22 swabbing pigs, gauging pigs, caliper pigs and commissioning train pigs during pipeline  
23 commissioning as the block valves will be welded into the pipeline at that stage. Therefore, as  
24 full bore type block valves are required irrespective of pipeline ILI capabilities, there would be no  
25 opportunity to save costs through the use of reduced port block valves.

26 Please also refer to the response to BCUC IR 1.14.2.  
27  
28

29  
30 14.4 For the proposed 30 NPS pipeline, what are the estimated incremental as-spent  
31 costs of the ILI tool launcher at the pipeline inlet and the ILI tool receiver at the  
32 pipeline outlet?  
33

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1 **Response:**

2 The incremental costs for the ILI launcher at Coquitlam Gate station and ILI receiver at East 2<sup>nd</sup>  
3 & Woodland station including materials (pipe, fittings, valves and actuators), construction,  
4 fabrication, pipe supports, inspection and testing is approximately \$1.9 million (2014\$).

5

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**C. PIPELINE ROUTING – COQUITLAM GATE**

**15.0 Reference: Coquitlam Gate – Route Selection Process**

**Exhibit B-1, Section 3.3.4, pp. 64–65; Exhibit B-1-1, Appendix A-17**

**Final Route Selection**

On pages 64 and 65 of the Application FEI explains the pipeline routing process, which is described in more detail in Appendix A-17.

**15.1 Please confirm:**

- a) Is FEI seeking CPCN approval to construct and operate each of the seven pipeline segments along their preferred routes as identified in Appendix A-17, or
- b) Is FEI seeking CPCN approval to construct and operate each of the seven pipeline segments along any of the route options discussed in Appendix A-17, or
- c) Is FEI seeking CPCN approval to construct and operate the Coquitlam Gate pipeline as long as it is built within a specific pipeline corridor?

**Response:**

This response addresses BCUC IR 1.15.1, 1.15.1.1, 1.15.1.2, 1.15.1.3, 1.15.2 and 1.15.3.

FEI is not seeking approval of a segmented Coquitlam Gate IP Project. FEI is seeking approval of a CPCN to construct and operate the entire Coquitlam Gate IP Project based on a routing that the Commission determines is in the public interest. Based on the information available to FEI at the time of the Application, FEI has proposed a preferred route that meets this requirement. Should another route emerge as a more suitable route alignment based on the Company's evaluation of information available subsequent to the filing of the Application, but prior to the close of the evidentiary record in this proceeding, such information will be provided to the Commission to support any proposed change.

Furthermore, if an approved routing was no longer considered feasible during the detailed engineering or construction stage and another route emerged as a feasible alternative subsequent to the CPCN approval (i.e. after the close of the current regulatory proceeding), FEI believes that a limited review by the Commission of the newly proposed route and changes (if any) resulting from the route change may be conducted based on the evidence provided by the Company. The overall need for the Projects, along with many other aspects of the Projects, would have already been accepted by the Commission as being in the public interest. If the situation described above does occur, the Company will propose a regulatory review process that will provide an efficient and effective review of the proposed change.

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As stated above, the Company is seeking approval of a CPCN to construct and operate the entire Coquitlam Gate IP Project based on a routing that the Commission determines is in the public interest. The Class 3 estimate provided in the Application is based on the preferred route proposed by the Company in the Application. FEI has not provided a Class 3 estimate for each section of the preferred route as the Company believes it would not be informative or necessary at this stage, particularly in light of the costs and resources required to develop these additional Class 3 estimates. Although the preferred route has different sections, each “section” is a component of the routing process and signifies a section of the overall pipeline between a fixed start and end point corresponding to the separation distance between lateral pipeline offtake points. The sections combined together form a complete route alignment. Although cost is an important consideration, as detailed in BCUC IR 1.16.1, for comparing route options in each section, the cost for the Project is based on an overall route alignment from Coquitlam Gate station to East 2<sup>nd</sup> & Woodland station.

15.1.1 If the answer to a) is yes, please provide separate AACE Class 4 estimates for each of the alternative routes discussed in Appendix A-17.

**Response:**

Please refer to the response to BCUC IR 1.15.1.

15.1.2 If the answer to b) is yes, please provide separate AACE Class 3 estimates for each of the alternative routes discussed in Appendix A-17.

**Response:**

Please refer to the response to BCUC IR 1.15.1.

15.1.3 If the answer to c) is yes, please define the specific pipeline corridor and explain under what conditions/how FEI would expect the Commission to approve a specific pipeline route given the uncertainty of the final route.

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1

2 **Response:**

3 Please refer to the response to BCUC IR 1.15.1.

4

5

6

7 15.2 If the Commission approved a route option discussed in the application and then  
8 FEI determined that route option was no longer viable and wished to deviate from  
9 that approved route option, what process would FEI propose to follow to select  
10 and receive approval to construct and operate the new pipeline route option?

11

12 **Response:**

13 Please refer to the response to BCUC IR 1.15.1.

14

15

16

17 15.3 Please provide separate AACE Class 3 estimates for each of the seven  
18 segments of the preferred route.

19

20 **Response:**

21 Please refer to the response to BCUC IR 1.15.1.

22

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**16.0 Reference: Coquitlam Gate Route Selection Details**

**Exhibit B-1, Section 3.3.4.5.2, pp. 74–75, Table 3-9; Exhibit B-1-1,  
Appendix A-17**

**Pipeline Route Evaluation Weightings**

In Table 3-9 FEI provides its pipeline route evaluation criteria and weightings. Cost is listed as criteria but is not provided a weighting, whereas all other criteria are provided a weight. In Appendix A-17 FEI evaluates each route option using these criteria and weightings to produce a route option ranking. Ranking number one for each route option is identified as the preferred pipeline route. In addition to, but separate from the route option ranking / selection of the preferred pipeline route process, FEI provides a cost ranking for each of the route alternatives.

16.1 Please explain and justify why in Table 3-9 FEI has not given any weight to the cost criteria.

**Response:**

This response addresses BCUC IRs 1.16.1, 1.16.2, 1.16.3.

FEI recognizes that cost is an important factor when considering an appropriate pipeline route, as are other considerations such as technical feasibility and stakeholder/community/environmental impacts. This response will address the following key considerations pertaining to route selection in terms of cost for the NPS 30 Coquitlam IP pipeline route analysis:

- Cost considerations;
- Cost analysis (weighting); and
- Cost as a route selection driver.

FEI completed both a non-financial and financial (comparative cost) analysis of the route options identified in each section of the route corridor. The estimated cost for constructing each route option was one of four categories considered as part of the analysis. Thus, FEI did not select a preferred route “separate from an evaluation of the estimated cost” of different route options. As explained in Application Exhibit B-1, section 3.3.4.5.3 (pages 76 and 77),

*“In addition to the non-financial route evaluation criteria, each route option was also ranked according to cost and the rankings compared. This helped to ensure that the selected preferred alignment meets the project’s economic objectives, without compromising safety or the environment while minimizing the overall pipeline footprint and local impact on the communities that the pipeline passes through.”*

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The non-financial analysis compared the route options against multiple evaluation criteria defined in Exhibit B-1, Table 3-9. A weighting was applied to these criteria as explained in Exhibit B-1, section 3.3.4.5.2, and the options were scored and ranked. Comparatively, the financial analysis considered a single key criteria – cost. Therefore, because cost was the only evaluation criteria, it was not necessary to apply a weighting; instead, the route options were directly compared and ranked in terms of relative construction costs (i.e. least expensive ranked first, etc.).

In effect, during the initial stages of the route selection process, the non-financial analysis identified a route alignment based on the highest ranked route option in each section and the financial analysis also identified a route alignment based on the highest ranked route option in each section. To complete both of these analyses required an iterative approach. FEI prepared a cost estimate consistent with an AACE Class 3 level of project definition for the route alignment identified from the non-financial analysis, as a starting point for the financial analysis. The estimate was prorated on length and construction factors to develop an estimated construction cost for each segment. Further AACE Class 5 estimates were also developed for each route alternative, and these cost estimates formed the basis of the financial route analysis.

To select the preferred route alignment the non-financial and financial route rankings were compared and reconciled in each section to determine which route option best met the routing objectives detailed in Exhibit B-1, section 3.3.4.1. In all cases, with the exception of Section 2 (Poirier to Robinson Coquitlam West), Section 3 (Robinson St. to Underhill Ave.), and Section 5 (Bainbridge Ave. to Springer Ave.), the highest ranked non-financial route option was also the least cost and was therefore selected as the preferred route.

In Sections 2, 3 and 5, the highest ranked non-financial option did not align with the highest ranked financial option (i.e. the route option selected on non-financial criteria was not the least cost). To reconcile the differences, the relative cost margin between these route options was considered and is summarized in the following table.

Route Corridor Section	Preferred Route Option	No. 1 Rank – Non-Financial	No. 1 Rank – Financial	Relative Cost Difference (%)	Overall Construction Cost Impact (%)
2	1	1	2	15	1.4
3	1	1	3	13	2.5
5	1	1	2	11	1.2

The actual cost difference in each section is approximately 1-3%, and the total difference between the selected preferred route and a route alignment comprising the least expensive (non-financial) route options is 5% of the total pipeline construction cost estimate. FEI considers

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1 that this difference, which is within the accuracy ranges of the AACE Class 3 and Class 5  
2 estimates, is not sufficient to influence the preferred route selection, which best met the routing  
3 objectives detailed in Exhibit B-1, Section 3.3.4.1.

4 The route selection process explicitly considered cost as separate but key criteria in determining  
5 the preferred route. It clearly demonstrates that FEI selected a preferred route alignment that is  
6 optimized in terms of Community and Stakeholder, Environmental and Technical criteria but for  
7 a relatively small additional cost. The calculated incremental cost difference is well within the  
8 range of accuracy of even a Class 3 estimate. The clarity provided by this approach justifies  
9 FEI's decision to include cost in the route selection process in this fashion and as an  
10 unweighted criterion in the financial analysis.

11  
12  
13  
14 16.2 Please explain and justify why FEI has identified its preferred pipeline route  
15 before and separate from an evaluation of the estimated cost of those routes.  
16

17 **Response:**

18 Please refer to the response to BCUC IR 1.16.1.  
19  
20

21  
22 16.3 Please confirm FEI would consider cost an important factor in its decision making  
23 process for selecting a pipeline route. If not confirmed, please explain why not.  
24

25 **Response:**

26 Yes, cost is an important factor when considering an appropriate pipeline route, as are other  
27 considerations such as technical feasibility and stakeholder/community/environmental impacts.

28 Please refer also to the response to BCUC IR 1.16.1.  
29  
30  
31



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16.4 Please discuss how much weight FEI would consider appropriate to be given to cost criteria in a pipeline route evaluation as compared to the other criteria listed in Table 3-9.

**Response:**

This response addresses BCUC IRs 1.16.4, 1.16.5, 1.16.6.

In general, pipeline route selection, including applied evaluation criteria, would depend to a large extent on the particular attributes of the pipeline design, and the general area in which it is to be constructed i.e. the geographical space and terrain between the start and end points. Route selection criteria would likely differ for a cross country pipeline through flat prairie or farmland, a mountain or rugged terrain pipeline route, or a pipeline mainly in urban areas such as the NPS 30 Coquitlam Gate IP. Therefore, FEI considers that the weighting of the evaluation criteria, in addition to the criteria itself, will be driven by project specific requirements. The routing process detailed in Exhibit B-1, section 3.3.4, and the criteria listed in Table 3-9, including the applied weightings, were developed specific to the urban nature of the route corridor from Coquitlam Gate station to East 2nd & Woodland.

As discussed in Exhibit B-1 and reiterated in response to BCUC IR 1.16.1, FEI recognizes that cost is an important factor in determining an appropriate pipeline route. FEI believes its methodology of considering costs for this Project as a separate unweighted, but distinct, evaluation category to the other three categories listed in Table 3-9 to be appropriate.

FEI has analyzed a range of cost weightings to present the sensitivity of the route option selection process when cost is weighted against the other criteria. To illustrate this, FEI has re-evaluated the route selection with a range of cost weightings from 10-50%. FEI's evaluation criteria and weighting is discussed in Exhibit B-1, section 3.3.4.5.2 and summarized in Table 1 below as a basis against which to compare the sensitivity analysis:

**Table 1**

	Criteria	Weight	% Weight
1	Community and Stakeholder	35	35%
2	Environmental	25	25%
3	Technical	40	40%
4	Cost	Considered Separately	Considered Separately
Total		100	100%

To re-evaluate the route options while including a weighting for cost, FEI merged, to a certain extent, the non-financial and financial analysis and adopted the following strategy:

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1. The cost weighting was entered into the route evaluation screening matrices;
- For each route option, the cost weighting was multiplied by the relative cost difference between the least expensive route option and each respective option to obtain an overall route option cost score;
- The cost weighting was assigned a negative value to reflect the negative impact increasing cost would have in terms of route selection. This approach is reasonable as it resulted in the cost score reducing the overall route option score, and, therefore, the greater the magnitude of the relative difference between route option costs, the greater the reduction in overall route option score;
- The cost score for each route option and the overall score from the other evaluation categories was summed; and
- The route options were ranked according to each respective overall score.

Table 2 below illustrates the ranking of the preferred route option when various cost weightings are incorporated into the route selection process. It shows that incorporating a weighting for cost has no impact on the selection of the preferred route until the cost weighting reaches 40% of the total. For the Coquitlam Gate IP and Fraser Gate IP Projects, FEI considers a weighting equal to the weightings of the three other evaluation categories appropriate as a maximum cost criteria weighting. This corresponds to a value in the 25-30% range, which is lower than the 40% weighting at which the route selection differs from the preferred route.

**Table 2**

Percentage Weighting					
Cost	10%	20%	30%	40%	50%
Community/Stakeholder	31%	28%	25%	21%	18%
Environmental	22%	20%	18%	15%	13%
Technical	36%	32%	28%	24%	20%
Total	100%	100%	100%	100%	100%
Preferred Route Ranking					
Section 1	1	1	1	1	1
Section 2	1	1	1	2	2
Section 3	1	1	1	1	1
Section 4	1	1	1	1	1
Section 5	1	1	1	1	2
Section 6	1	1	1	1	1
Section 7	1	1	1	1	1

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16.5 Please re-evaluate the alternative route including weight for the cost criteria.

**Response:**

Please refer to the response to BCUC IR 1.16.4.

16.6 Please provide comment on this alternative route option evaluation method. In response, provide comment on any changes from the original route rankings to the new route rankings and explain/justify the cost weight chosen.

**Response:**

Please refer to the response to BCUC IR 1.16.4.

16.7 Please discuss the sensitivity of FEI's preferred route rankings to changes in each of FEI's criteria weightings. Please provide a sensitivity analysis to explain your responses.

**Response:**

Exhibit B-1, Section 3.3.4.5.2, and Table 3-9, detail the evaluation criteria and weighting adopted for the NPS 30 Coquitlam Gate IP pipeline route selection analysis. Three categories were established with the following total weightings distributed across twelve sub criteria, which formed the basis of the route evaluation. A fourth category (cost) was also applied; even though it was not assigned a "weight" as the other factors (please refer to the response to BCUC IR 1.16.1 for further details).

1. Community and Stakeholder – 35 (health and safety-15, socio-economic-15, land ownership-5);
2. Environmental – 25 (ecology-5, cultural-5, human-15);
3. Technical - 40 (engineering-5, construction-10, operation-10, system interface-5, adjacent infrastructure-5, natural hazards-5); and
4. Cost – no specific weighting assigned.

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To test the sensitivity of the preferred route rankings to changes in each of the route evaluation criteria weightings, the higher weightings applied to some criteria were reduced such that each broad category shared an even percentage of the total weighting. This approach removed the previous asymmetry from the category weightings and facilitated a baseline analysis which evenly distributed the criteria weighting for each broad category, summarized here for comparison:

1. Community and Stakeholder – 33.3 (health and safety-11.1, socio-economic-11.1, land ownership-11.1);
2. Environmental – 33.3 (ecology-11.1, cultural-11.1, human-11.1);
3. Technical – 33.3 (engineering-5.6, construction-5.6, operation-5.6, system interface-5.6, adjacent infrastructure-5.6, natural hazards-5.6); and
4. Cost – no specific weight number assigned.

Table 1 below shows a comparison of the selected highest ranked route options and score for each section of the preferred route, compared with the highest ranked route options and scores from an even weighting distribution for each criteria. This sensitivity analysis does not include a weighting number for the cost criteria as outlined in BCUC IR 1.16.4.

This sensitivity analysis illustrates that the preferred route rankings are the same in each section of route corridor and the overall preferred route selection is robust in terms of this sensitivity test.

**Table 1: Sensitivity Analysis**

Section	Preferred Route – Adopted Weighting			Route Selection - Even Weighting Distribution for Each Category		
	Route Option	Route Rank	Route Score	Route Option	Route Rank	Route Score
1	1	1	335	1	1	362
2	1	1	335	1	1	362
3	1	1	305	1	1	312
4	1	1	305	1	1	312
5	1	1	320	1	1	334
6	3	1	335	3	1	356
7	1	1	330	1	1	340

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**17.0 Reference: Coquitlam Gate Route Selection Details**

**Exhibit B-1-1, Appendix A-17, p. 25**

**Section 4 – Underhill to Bainbridge Ave.**

In Appendix A-17 FEI provides the Coquitlam Gate pipeline route options analysis and evaluation. For pipeline sections 1, 2, 3, 5, 6 and 7, FEI includes discussion on community and stakeholder impacts, environmental impacts, technical considerations, cost, as well as route options scoring and selection, and provides a screening matrix.

17.1 Please provide a similar route option analysis, evaluation and discussion for pipeline section 4.

**Response:**

Section 4 connects the district station at Underhill Avenue & Broadway with the district station at Bainbridge Avenue & Broadway in Burnaby. Three route options were initially analyzed and the results presented in Exhibit B-1, Appendix A-17. There were major differences between these options in terms of length, cost and construction challenges that resulted in Option 1 on Broadway being selected as the preferred route without the need for full evaluation and screening matrix. However, further to this Information Request, a detailed route analysis, evaluation and discussion is presented here for two of the route options included in Exhibit B-1, Appendix A-17, Section 2.4. Option 3, initially considered, was 82% and 36% longer than Option 1 and 2 respectively and 80% more expensive than Option 1 to construct. Therefore, as Option 3 offered no other significant advantage, only Option 1 and 2 have been included in this review.

- **Option 1 (Preferred Route):** From Broadway at Underhill Avenue to Broadway at Bainbridge Avenue (parallel to the existing NPS 20 IP pipeline)
- **Option 2 (Lougheed Route):** From Broadway at Underhill Avenue west along Broadway to Lake City Way south on Lake City Way and east on Lougheed Highway to Bainbridge Avenue.

Option 1, the selected (preferred) route, involves an alignment along Broadway parallel to the existing NPS 20 IP pipeline. There would be a bored crossing required just west of Underhill Avenue where existing third party pipelines connect an existing tank farm on the north side of Broadway with a storage facility on the south side of Broadway. It is proposed to trench across Eagle Creek in the Broadway roadway where the creek is confined to a deep pipe culvert. East of Eagle Creek, the pipeline construction productivity increases as there are fewer properties both north and south of Broadway. West of Eagle Creek the construction productivity is reduced due to increased utility density particularly between Duthie Avenue and Bainbridge

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1 Avenue. Broadway is only two lanes in this area and it is likely the entire road would be closed  
2 along this section to facilitate construction. There would be some access issues but the  
3 construction could be staged to mitigate most of them.

4 Option 2 is also located on Broadway for the initial portion of the alignment (similar to Option 1)  
5 and to the south of Broadway on Lougheed Highway for the remainder of this option alignment.  
6 This route would transfer from Broadway to Lougheed Highway south along Lake City Way  
7 which is lined on both sides by business and commercial accesses. The pipeline construction  
8 would impact the operation of these accesses. This option would also cross Eagle Creek at  
9 Lougheed Highway where it is confined to a relatively shallow culvert with a number of other  
10 utilities running longitudinally and transversely over the culvert. Because of these restrictions it  
11 is likely that the NPS 30 gas pipeline would need to be installed below the culvert using  
12 trenchless methods. The Lake City Way Skytrain station is located immediately east of the  
13 Lougheed Highway Eagle Creek crossing where the elevated guide way crosses from the north  
14 side to the centre of Lougheed diagonally across the highway. There is no space to complete  
15 the trenchless crossing entry and exit points outside of the highway corridor due to existing  
16 development; therefore, the crossing construction would have to be completed within the  
17 highway road allowance. The potential for conflict with the Lougheed Skytrain station and  
18 guiderail infrastructure and the constrained setup space would result in a challenging crossing.  
19 Construction along the Lougheed Highway would facilitate greater pipeline construction  
20 productivity compared to Broadway; however, both west bound lanes would be closed for a  
21 period of time to accommodate the construction which would result in traffic impacts.

## 22 **Community and Stakeholder Impacts**

### 23 Health and Safety

24 Route Option 1 and Option 2 share the same alignment on Broadway for the initial portion of  
25 this corridor section. At Lake City Way both route options diverge with Option 2 turning south  
26 onto Lake City Way and then west on Lougheed Highway. Option 1 on Broadway would involve  
27 a smaller construction crew and setup zone and slower construction which would occur within  
28 isolated sections of road. The Lougheed Option would involve a long trenchless crossing and  
29 trenched pipeline construction adjacent to road users and in close proximity to the Lake City  
30 Way Skytrain station and guide rail infrastructure. Comparatively the Lougheed option presents  
31 a greater risk to the general public, road users, rail users and pipeline construction personnel.

- 32 • Proposed Route: moderate impact, good route choice (3)
- 33 • Lougheed Option A: high negative impact, poor choice (2)

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## 1 Socio-Economic

2 The shared alignment on Broadway for the initial portion of this corridor section between  
3 Underhill Avenue and Lake City Way contains few accesses. Option 1 on Broadway between  
4 Lake City Way and Bainbridge, would restrict through traffic movement and impact local traffic  
5 access. Impacts to local access could be mitigated with staged construction which would  
6 maintain access as required. Comparatively, Option 2 on Lougheed Highway presents a greater  
7 socio-economic impact due to its alignment on Lake City Way which would impact numerous  
8 business and commercial accesses and the traffic impacts on Lougheed Highway.

9 • Proposed Route: moderate impact, good route choice (3)

10 • Lougheed Option A: high negative impact, poor choice (2)

## 11 Land Ownership and Use

12 Option 1 would install the pipeline in Broadway adjacent to other utilities where there is sufficient  
13 offset available for construction while maintaining proximity to other utilities for maintenance  
14 access. There is a short 200m section between Duthie Avenue and Bainbridge Avenue where  
15 space is limited resulting in minimum offset to adjacent utilities, however, the available road  
16 allowance extends significantly beyond the paved road surface along this area which would  
17 facilitate future utility installation outside the road paved width. Option 2 could be installed in the  
18 west bound or east bound lanes. There are less existing utilities present in the east bound lanes  
19 which would provide greater distance between the pipeline trench and the Skytrain guide rail  
20 which is situated along the centre of Lougheed Highway between Lake City Way and Bainbridge  
21 Avenue.

22 • Proposed Route: high negative impact, poor choice (2)

23 • Lougheed Option A: moderate impact, good route choice (3)

## 24 **Environmental Impacts**

### 25 Ecology

26 Both Option 1 and Option 2 would cross Eagle Creek with risk of potential environmental impact  
27 during pipeline construction. However, Option 2 on Lougheed would involve a trenchless  
28 crossing beneath the creek with greater risk of negative environmental impacts from inadvertent  
29 spills particularly during the trenchless drilling operation.

30 • Proposed Route: low impact, better route choice (4)

31 • Lougheed Option A: moderate impact, good route choice (3)

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1    Cultural Heritage

2    Both options directly impact disturbed road allowance with low risk of negative cultural heritage  
3    impacts.

- 4           • Proposed Route: low impact, better route choice (4)
- 5           • Loughheed Option A: low impact, better route choice (4)

6    Human Environment

7    West of Lake City Way, Option 1 would involve slower construction and temporarily impact local  
8    traffic movement, parking and residential access with greater potential for risk of disturbance  
9    from pipeline construction activities. Option 2 would involve construction along Lake City Way  
10   and Loughheed Highway with relatively lower impact to the local human environment from  
11   construction.

- 12           • Proposed Route: moderate impact, good route choice (3)
- 13           • Loughheed Option A: low impact, better route choice (4)

14   **Technical Considerations**

15   Engineering

16   Option 1 and Option 2 would involve the same engineering requirements for the shared portion  
17   of the alignment on Broadway between Underhill Avenue and Lake City Way. At this point both  
18   routes diverge; Option 1 would involve conventional trenched construction to the end of the  
19   section at Bainbridge Avenue. Option 2 on Loughheed Highway would involve a long trenchless  
20   crossing of Eagle Creek and also a parallel alignment within close proximity to the Skytrain  
21   guiderail support structures which are located along the centre of Loughheed. There would be  
22   relatively greater engineering effort associated with the Loughheed Option compared to the  
23   Proposed Route.

- 24           • Proposed Route: moderate impact, good route choice (3)
- 25           • Loughheed Option A: high negative impact, poor choice (2)

26   Construction

27   Option 1 and Option 2 would also involve the same construction requirements for the shared  
28   portion of the alignment between Underhill Avenue and Lake City Way. Both routes then  
29   diverge and Option 1 on Broadway would involve conventional trenched construction and  
30   include a short section with significant utility which would restrict construction productivity. The  
31   Loughheed Option would involve a long trenchless crossing to install the pipeline under the bed



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of Eagle Creek, and also construction activities in proximity to the Skytrain guiderail support structures with greater construction effort and risk.

- Proposed Route: moderate impact, good route choice (3)
- Lougheed Option A: high negative impact, poor choice (2)

#### Operation

Option 1 on Broadway would install the pipeline adjacent to existing utilities but would maintain sufficient offset to operate and maintain both the proposed pipeline and other utilities. Option 2 on Lougheed would install the pipeline along a major highway and also install the pipeline at extra depth to cross beneath Eagle Creek. These requirements would create access issues to the pipeline for operation and maintenance activities and therefore increase the operational burden relative to Option 1.

- Proposed Route: moderate impact, good route choice (3)
- Lougheed Option A: high negative impact, poor route choice (2)

#### System Interface

Both route options would require the same system interface considerations at Underhill Avenue, the lateral offtake at Lake City Way and at Bainbridge Avenue.

- Proposed Route: low impact, better route choice (4)
- Lougheed Option A: low impact, better route choice (4)

#### Adjacent Infrastructure

Both route options would share the same alignment for the initial portion of this corridor section. For the latter portion of this section Option 1 would be installed in Broadway adjacent to other utilities including BC Hydro buried transmission cables. Option 2 on Lougheed would install the pipeline within close proximity to the Skytrain elevated guide rail support towers which are located along the central median and where the highway is only two lanes.

- Proposed Route: high negative impact, poor route choice (2)
- Lougheed Option A: high impact, poor route choice (2)

#### Natural Hazards

Both route options present the same considerations and risks in terms of natural hazards.

- Proposed Route: moderate impact, good route choice (3)

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- 1        • Lougheed Option A: moderate impact, good route choice (3)

2        **Cost**

3        Option 1 is 2,205 m in length, Option 2 at 2,990 m in length is approximately 36% and longer  
4        than the Option 1 and also includes a long trenchless crossing under Eagle Creek. The  
5        additional length and trenchless construction results in Option 1 being the less expensive route  
6        option compared to Option 2.

7        **Route Options Scoring and Selection**

8        The route option evaluation is presented in Table 1. Option 2 on Lougheed Highway offers  
9        benefits over Option 1 in terms of Land Ownership and Use and Human Environment impacts.  
10       In all other criteria Option 1 on Broadway scores higher and ranks highest overall. The  
11       trenchless crossing of Eagle Creek at Lougheed Highway on Option 2, which is not required on  
12       the Option 1, drives the lower score in terms of Health and Safety and most of the  
13       Technical/Engineering evaluation criteria compared to Option 1 on Broadway. The trenchless  
14       crossing is also the main driver for the large difference in cost between both routes. The  
15       analysis, evaluation and discussion presented here substantiates the selection of Route Option  
16       1 on Broadway as least impact lowest cost option and therefore the preferred alignment for this  
17       section of route corridor.

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**Table 1: Underhill Avenue to Bainbridge Avenue Route Options Screening Matrix**

Metro IP Route Selection: Underhill to Bainbridge (Burnaby East)					
Impact and Vulnerability Considerations	Option Length (m)	Option 1		Option 2	
		2205		2990	
		Broadway		Underhill Ave + Lougheed Hwy	
	Weight	Score	Weighted Score	Score	Weighted Score
<b>Community/Stakeholder</b>					
Health and Safety	15	3	45	2	30
Socio Economic	15	3	45	2	30
Land Ownership and Use	5	2	10	3	15
<b>Environmental</b>					
Ecology	5	4	20	3	15
Cultural Heritage	5	4	20	4	20
Human Environment	15	3	45	4	60
<b>Engineering/Technical</b>					
Engineering/Design	5	3	15	2	10
Construction	10	3	30	2	20
Operation	10	3	30	2	20
System interface	5	4	20	4	20
Adjacent Infrastructure	5	2	10	2	10
Natural Hazards	5	3	15	3	15
<b>Totals</b>	<b>100</b>		<b>305</b>		<b>265</b>
<b>Ranking</b>		<b>1</b>		<b>2</b>	
<b>Relative Cost</b>		<b>100%</b>		<b>186%</b>	
<b>Cost Ranking</b>		<b>1</b>		<b>2</b>	

17.2 Please confirm if the routing of pipeline section 4 along Lougheed is still under consideration.

**Response:**

Not confirmed. The routing for section 4 of the Coquitlam Gate IP pipeline along Lougheed Highway is no longer under consideration.

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1 Please also refer to the response to BCUC IR 1.17.1.

2

3

4

5 17.2.1 If confirmed, please elaborate. If not confirmed, please explain why not.

6

7 **Response:**

8 Please refer to the responses to BCUC IRs 1.17.1 and 1.17.2. The routing for section 4 of the  
9 Coquitlam Gate IP pipeline along Lougheed Highway is no longer under consideration because  
10 the original Route Option 1 on Broadway was evaluated to be the least impact, lowest cost  
11 option and is therefore the preferred alignment for this section of route corridor.

12

13

14

15 17.3 Assuming sections 5 and 6 are re-routed to Lougheed, please elaborate on the  
16 costs, benefits, risks and impacts of also re-routing section 4 to Lougheed.

17

18 **Response:**

19 Please refer to the response to BCUC IR 1.17.1.

20

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**18.0 Reference: Further Analysis Of Lougheed Highway**

**Exhibit B-1, Section 3.3.4.7, p. 80**

**Sections 5 – Bainbridge to Springer and Section - 6 Springer to Boundary**

FEI on page 80 states:

As a result of the feedback from the City, FEI, in conjunction with the City of Burnaby and in consultation with other stakeholders such as Translink, B.C. Hydro and MoTI, will conduct further analysis to determine if a route option along Lougheed Highway in Section 5 and 6 is feasible. It is anticipated that this analysis will be completed by early 2015. If the analysis shows that a route option along Lougheed Highway is technical feasible, constructible, that traffic issues can be managed with reasonable efforts and that the route option scoring and cost is comparable to the current preferred route alignment options, FEI will submit a revised route evaluation for the sections of route corridor through Burnaby to the BCUC for consideration.<sup>15</sup>

18.1 Please provide an update on the discussion with the City of Burnaby regarding the routing of sections 5 and 6 along Lougheed.

**Response:**

FEI has held additional meetings and exchanged correspondence with engineering staff at the City of Burnaby, and briefed Burnaby City Council on March 2, 2015 to provide an update on the continuing analysis of constructability and traffic and other potential impacts along Lougheed Highway. Two potential options along Lougheed Highway have been identified. A high level business impact analysis has been completed, and impacts to other utilities' operations are also being assessed.

18.2 Please discuss the impacts, benefits and risks to the project if pipeline sections 5 and 6 were routed along Lougheed.

---

<sup>15</sup> Exhibit B-1, p. 80.

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1    **Response:**

2    FEI is currently analyzing Lougheed Highway as a potential route option for the Coquitlam Gate  
3    IP pipeline in route corridor sections 5 and 6. An evidentiary update is expected to be filed in  
4    late April 2015 which will present the analysis and findings, including impacts, costs, benefits  
5    and risks to the Project of routing the pipeline along Lougheed Highway. At that time, FEI  
6    expects to advise the Commission, based on the Company's public consultation and  
7    engagement, technical and cost analysis and discussions with the City of Burnaby, that  
8    Lougheed Highway is either:

- 9        • Not feasible;
- 10       • Feasible but not preferred; or
- 11       • Feasible and the new preferred route option.
- 12

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## **D. COST – COQUITLAM GATE**

### **19.0 Reference: Coquitlam Gate – Alternatives**

#### **Exhibit B-1, p. 33**

#### **Class 4 Cost Estimates for Alternatives**

On page 33 of the Application FEI explains:

Based on an average cost of approximately \$92,200 per site (using average actual dig and repair costs from 2011-2013) and 1,667 digs (based on a dig every 12 metres of the 20,000 metre pipeline) the Company has estimated that the cost associated with this alternative could be approximately \$154 million.<sup>16</sup>

19.1 Please provide the actual dig and repair costs from the 2011–2013 period, per site.

#### **Response:**

Please refer to the table below for a list of actual dig costs (including repair, or mitigation, as required). Please note that site-specific work orders were implemented to capture dig costs starting in 2013.

The average of \$92,200 is obtained by taking the sum of dig costs (\$1,660,000) divided by the total number of digs (18).

Year	Dig No.	Dig Location	Mitigation	Cost of Dig(s)
2011	1	Lane behind Brentlawn west of Fairlawn	Weld Sleeve	\$1,040,000 (all 2011, part 2012)
2011	2	Lane behind Brentlawn west of Fairlawn	Recoat	
2011	3	Lane behind Brentlawn west of Fairlawn	Recoat	
2011	4	West of 7584 Broadway Avenue	Recoat	
2011	5	West of 7584 Broadway Avenue	Recoat	
2011	6	West of 7584 Broadway Avenue	Recoat	
2012	7	Como Lake Avenue west of Mariner	Recoat	
2012	8	Como Lake Avenue west of Mariner	Recoat	
2012	9	Como Lake Avenue west of Mariner	Recoat	
2012	10	2 <sup>nd</sup> Ave. west of Skeena	Recoat	\$157,000 (part 2012)
2012	11	2 <sup>nd</sup> Ave. west of Skeena	Cut Out	
2012	12	2 <sup>nd</sup> Ave. west of Skeena	Recoat	
2012	13	2 <sup>nd</sup> Ave. west of Skeena	Recoat	
2013	14	2 <sup>nd</sup> Ave. west of Skeena	Recoat	\$64,000
2013	15	2nd Ave. between Garden and Templeton	Recoat	\$108,000

<sup>16</sup> Exhibit B-1, p. 33.

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Year	Dig No.	Dig Location	Mitigation	Cost of Dig(s)
2013	16	Broadway East of Gaglardi	Recoat	\$86,000
2013	17	Halifax - between Taralawn and Delta	Recoat	\$95,000
2013	18	Broadway West of Lake City	Recoat	\$110,000

19.2 Please provide the median cost.

**Response:**

To calculate a median cost, FEI has utilized an average dig cost where the individual dig costs were not available. The table below contains the estimated or actual (where available) costs per dig utilized for the calculation, which produces a median cost of \$112,778.

Year	Dig No.	Dig Location	Cost of Dig(s)	Estimated or Actual Cost per Dig
2011	1	Lane behind Brentlawn west of Fairlawn	\$1,040,000 (all 2011, part 2012)	\$115,556
2011	2	Lane behind Brentlawn west of Fairlawn		\$115,556
2011	3	Lane behind Brentlawn west of Fairlawn		\$115,556
2011	4	West of 7584 Broadway Avenue		\$115,556
2011	5	West of 7584 Broadway Avenue		\$115,556
2011	6	West of 7584 Broadway Avenue		\$115,556
2012	7	Como Lake Avenue west of Mariner		\$115,556
2012	8	Como Lake Avenue west of Mariner		\$115,556
2012	9	Como Lake Avenue west of Mariner		\$115,556
2012	10	2 <sup>nd</sup> Ave. west of Skeena	\$157,000 (part 2012)	\$39,250
2012	11	2 <sup>nd</sup> Ave. west of Skeena		\$39,250
2012	12	2 <sup>nd</sup> Ave. west of Skeena		\$39,250
2012	13	2 <sup>nd</sup> Ave. west of Skeena		\$39,250
2013	14	2 <sup>nd</sup> Ave. west of Skeena	\$64,000	\$64,000
2013	15	2nd Ave. between Garden and Templeton	\$108,000	\$108,000
2013	16	Broadway East of Gaglardi	\$86,000	\$86,000
2013	17	Halifax - between Taralawn and Delta	\$95,000	\$95,000
2013	18	Broadway West of Lake City	\$110,000	\$110,000

19.3 Please confirm, otherwise explain, that coating disbondment has been discovered at all previous inspection locations.



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1 **Response:**

2 FEI has excavated and inspected a total of 38 girth welds along the length of the existing NPS  
3 20 Coquitlam Gate IP pipeline, including the 15 leak locations. Of these 38 inspected girth  
4 welds, 74% have been found with field-applied girth weld coating disbondment.

5

6

7

8 19.4 Please confirm, otherwise explain, that disbondment is expected at all 1,667 dig  
9 locations.

10

11 **Response:**

12 As discussed in the response to BCUC IR 1.19.3, based on prior inspection results,  
13 disbondment is not expected at all 1,667 dig locations, but it would be expected at the majority  
14 of dig locations.

15

16

17

18 19.5 Please confirm and justify that Alternative 2, the \$154 million option, is an AACE  
19 Class 4 estimate. If not confirmed, please explain why not.

20

21 **Response:**

22 The estimated cost of approximately \$154 million, as referenced from Exhibit B-1 Section  
23 3.2.2.2, is not an AACE Class 4 estimate. FEI would consider the estimate to be more  
24 consistent with an AACE Class 5 estimate. AACE notes that the alternate ANSI standard  
25 terminology for this class of estimate is “order of magnitude” and is considered by AACE to have  
26 a level of project definition of 2% or less and a high-end accuracy range of -50% to +100%,  
27 which would apply in this case. This alternative does not fully mitigate potential future pipeline  
28 corrosion leaks because only a relatively short length of pipeline at each weld location has been  
29 estimated to have been exposed for inspection, evaluation and repair. Considering this  
30 limitation, FEI believes that it was appropriate to rely on recent historical actual costs as cited in  
31 the preamble to develop an indicative cost estimate for Alternative 2.

32

33

34

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19.6 Please justify that Alternatives 3, 4 and 5 are AACE Class 4 estimates by comparing the information FEI provided in the Application to the AACE Estimate Input Checklist and the definition of an AACE Class 4 estimate.

**Response:**

The Alternatives 3, 4 and 5 fall within the parameters of an AACE Class 4 estimate. All criteria for the class are met including engineering definition of 1% to 15% completed.

The AACE Class 4 Input Checklist shows the following parameters were all met:

- Level of Project Definition – Preliminary
- Plant Production / Facility Capacity - Preliminary
- Location – Approximate
- Soils & Hydrology – Preliminary
- Integrated Project Plan – Preliminary
- Project Master Schedule – Preliminary
- Escalation Strategy – Preliminary
- Work Breakdown Structure – Preliminary
- Project Code of Accounts – Preliminary
- Contracting Strategy – Assumed
- Block Flow Diagrams – Preliminary
- Plot Plans – Started
- Process Flow Diagrams (PFDs) – Started/Preliminary
- Utility Flow Diagrams (UFDs) – Started/Preliminary
- Piping & Instrument Diagrams (P&IDs) – Started
- Heat & Material Balances – Started
- Process Equipment List – Started/Preliminary
- Utility Equipment List – Started/Preliminary
- Electrical One-Line Drawings – Started/Preliminary
- Specifications & Datasheets – Started
- General Equipment Arrangement Drawings – Started

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**20.0 Reference: Coquitlam Gate – Project Cost Estimate**

**Exhibit B-1**

**Preparation Effort and Project Definition**

20.1 Please provide the cost of preparing the estimate, the number of hours spent preparing the estimate, the preparation effort and a specific percent project definition complete at the time of the estimate for each of Alternatives 2 through 6, including each of the alternative pipeline routes.

**Response:**

Please refer to the response to BCUC IR 1.19.5 for details pertaining to Alternative 2. The engineering effort to analyze, compare and evaluate Alternatives 3 through 6, which comprised new pipelines of different diameters and operating pressures and involved routing considerations and station upgrades, was developed as a unified body of work during the Front End Engineering Design (FEED) stage. Therefore, it is would be difficult to prepare an accurate breakdown for each alternative of the cost of preparing the estimate, the number of hours spent preparing the estimate, the preparation effort and a specific percent project definition complete at the time of the estimate. The combined breakdown for these alternatives is presented as follows:

- Cost of preparing the estimate for these alternatives: \$1.854 million;
- The number of hours spent preparing the estimate is approximately 9,000 comprising both FEI internal team members and external consultants;
- The preparation effort is dictated by the scale and complexity of the project and the estimate class and level of project definition required. In this case, the Coquitlam Gate IP Project is a multi-disciplinary project which required the input from a diverse team comprising FEI internal Subject Matter experts and external professionals;
- Specific percent project definition complete at the time of the estimate for Alternative 6: 10-40% as stated in FEI Application Exhibit B-1, Appendix A24; and
- Specific percent project definition complete at the time of the estimate for Alternatives 3 to 5: 1-15%.

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1     **E.       RISKS – COQUITLAM GATE**

2     **21.0   Reference:   Coquitlam Gate - Other Pending Or Anticipated**  
3                                 **Applications/Conditions**

4                                 **Exhibit B-1, p. 93**

5                                 **Land Acquisition and Access Rights**

6             FEI on page 93 of the Application states:

7                                 ...the Coquitlam Gate IP project may involve the acquisition of new land and  
8                                 access rights for an approximate 70 meters of the proposed route alignment  
9                                 between Boundary Road and Highway No. 1. FEI will finalize any new land and  
10                                access right negotiations once approval of this Application is received.<sup>17</sup>

11            21.1   Please confirm, otherwise explain, that FEI has been in discussions with the  
12                                 affected land owners regarding land acquisition and access rights for this area.

13

14     **Response:**

15     The responses to the BCUC IR 1.21 series of information requests are being filed confidentially  
16     as they contain specific property information and thus identifiable property owner information, as  
17     well as information on FEI's current negotiation status. FEI believes that the public release of  
18     such information will jeopardize FEI's ability to effectively negotiate a fair acquisition price for  
19     the property required for the Project.

20

21

22

23                    21.1.1   If confirmed, please elaborate on those discussions and provide any  
24                                 concerns those stakeholders may have had. If not confirmed, please  
25                                 explain why not.

26

27     **Response:**

28     Please refer to the response to BCUC IR 1.21.1.

29

30

31

---

<sup>17</sup> Exhibit B-1, p. 93.

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1            21.2    Please elaborate on the potential risks to the project as it relates to the  
2                            requirement of acquiring the new land and access rights for this area.

3  
4    **Response:**

5    Please refer to the response to BCUC IR 1.21.1.

6

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## 22.0 Reference: Coquitlam Gate – Financial Considerations

### Exhibit B-1, Section 3.2.3.2, p. 44, Table 3-3; Appendix A-10

#### Operational Risk Reduction

FEI on page 44 of the Application states:

Operational risk is a measure of loss-of-service impact, and is defined as the sum of the quantitative risk value of each pipeline section per year of operation, based on failure frequency per year and financial cost per event associated with the loss-of-service. The calculation of the annual risk reduction associated with the Project is included in Appendix A-10. There is no operational risk reduction during design day calculations for Alternative 4. Only Alternative 6 can provide 100 percent operational risk reduction.<sup>18</sup>

**Table 1 - Coquitlam Gate IP Project Financial and Operation Risk Comparison**

		Alternative 4 Install NPS 24 pipeline at 2070 kPa	Alternative 6 Install NPS 30 pipeline at 2070 kPa
1	Operational Risk Reduction (%)	0	100
2 <sup>17</sup>	Remaining Operational Risk (2014\$millions / year)	2.456	0
3	PV Remaining Operational Risk – 60 Yr <sup>18</sup> (\$millions)	38.880	0
4	PV Incremental Cost of Service – 60 Yr (\$millions)	259.659	300.513
5	PV Remaining Operational Risk + PV Incremental Cost of Service – 60Yr (\$millions)	298.539	300.513

In Appendix A-10 Dynamic Risk Assessment Systems, Inc. (DRAS) provides a quantitative risk assessment of the existing FEI pipeline system in the Lower Mainland and compares it to situations where several pipelines are replaced and/or upgraded, including lopping the NPS 20 transmission pressure pipeline between Cape Horn and Coquitlam Gate.

22.1 Please provide the potential annual operational risk reduction associated with replacing the existing Coquitlam NPS 20 IP pipeline operating at 1200kPa with an NPS 30 IP pipeline operating at 2070kPa only, and update the Alternative 6 column of Table 3-3 accordingly (i.e. assume the Cape Horn to Coquitlam Gate project does not go ahead).

<sup>18</sup> Exhibit B-1, p. 44.

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**Response:**

The question posed considers a Coquitlam Gate IP pipeline and Metro IP system that have sufficient capacity to support all connected customers under design conditions but impose the constraint that the Coastal Transmission System (CTS) upstream would have insufficient capacity to meet peak CTS demand if the full load from Fraser Gate was shifted to Coquitlam Gate. More specifically the constraint on the CTS system would be an inability to achieve the minimum design inlet pressure to the Eagle Mountain Compressor Station (EM) in Coquitlam serving Vancouver Island.

As described in the response to BCUC IR 1.8.2, with the NPS 30 IP pipeline in place, there is an opportunity to avoid a more widespread low pressure outage across the system. This opportunity is not available in alternatives that do not have full resiliency. In the scenario considered, the load shift from Fraser to Coquitlam would drop the inlet pressure to the Eagle Mountain Compressor Station (serving Vancouver Island). An Eagle Mountain shut down would force the FEI Vancouver Island system to sustain on line pack which is possible for short periods of time at peak demand. When Eagle Mountain shuts down, pressures in CTS will rebound to a point sufficient to sustain the required inlet pressure at Coquitlam Gate. This allows feed to be maintained temporarily at full flow to the Metro IP system resulting in no customers lost initially. In order to restore supply to Vancouver Island load (customers) would need to be curtailed from the Metro IP system to allow the CTS to satisfy the minimum pressure constraints at both the Eagle Mountain Compressor Station and Coquitlam Gate. On that basis the risk associated with the scenario described in the information request is summarized and characterized in the following Table 1.

As outlined in the Quantitative Risk Assessment of LMSU Projects (Appendix A-10), impacts reflect a reasonable worst case scenario at design conditions.

**Table 1**

Segment	Segment Length (km)	Number of Customers Impacted	Maximum Outage Time (days)	Total Impact (million\$)	Probability of Failure (failures/year)	Total Risk (\$/year)
Nichol to Roebuck NPS 24	1.7	121270	8.5	74.25	6.98E-04	51,827
Roebuck to Delta NPS 24/36	7.34 (avg)	121270	8.5	74.25	7.53E-04	55,910
Delta to Tilbury NPS 24/36	5.34 (avg)	98660	10.4	75.66	5.19E-04	39,268
Tilbury to Fraser NPS 20/24	9.7 (avg)	84170	8.9	53.44	9.86E-04	52,692
IP Segment 1	4.76	39970	5.2	22.25	1.95E-03	43,388

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Segment	Segment Length (km)	Number of Customers Impacted	Maximum Outage Time (days)	Total Impact (million\$)	Probability of Failure (failures/year)	Total Risk (\$/year)
IP Segment 2	0.92	0	0	0	3.78E-04	0
IP Segment 3	3.24	0	0	0	1.33E-03	0
IP Segment 4	0.48	0	0	0	1.95E-04	0
IP Segment 5	1.81	0	0	0	7.43E-04	0
IP Segment 6	1.34	0	0	0	5.50E-04	0
IP Segment 7	0.54	0	0	0	2.22E-04	0
IP Segment 8	2.97	0	0	0	1.22E-03	0
IP Segment 9	0.2	0	0	0	8.21E-05	0
IP Segment 10	3.78	2840	5.6	2.06	1.55E-03	3,193
IP Segment 11	0.68	0	0	0	2.79E-04	0
IP Segment 12	2.98	0	0	0	1.22E-03	0
IP Segment 13	5.15	0	0	0	2.11E-03	0
Cape Horn to Coquitlam NPS 20	4.6	163,280	16	181.95	1.89E-03	343,658
Port Mann to Cape Horn NPS 36	1.28	163,280	16	181.95	5.26E-04	95,644
Nichol to Port Mann NPS 24	5	172,572	15.8	192.63	2.05E-03	395,471
<b>Total</b>						<b>1,081,051</b>

1

2 Given the above risk breakdown, the potential risk reduction that is associated with the system  
3 reinforcement outlined in the information request is calculated to be the difference between the  
4 \$3.054 million/year risk associated with today's system and the remaining risk of \$1.081  
5 million/year following the completion of the Project as described in the information request. This  
6 results in a risk reduction of approximately \$1.973 million/year.

7 Based on the above, the potential annual operational risk reduction associated with replacing  
8 the existing Coquitlam NPS 20 IP pipeline operating at 1200kPa with an NPS 30 IP pipeline  
9 operating at 2070kPa only, and the updated Alternative 6 column of Table 3-3 of the Application  
10 is presented in the revised table.



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1

**Revised Table 3.3**

		<b>Alternative 6<sup>19</sup> Install NPS 30 Pipeline at 2070 kPa</b>
1	Operational Risk Reduction (%)	64.6%
2	Remaining Operational Risk (2014 \$millions/year)	1.081
3	PV Remaining Operational Risk – 60 Yr (\$millions)	17.114
4	PV Incremental Cost of Service – 60 Yr (\$millions)	300.513
5	PV Remaining Operational Risk + PV Incremental Cost of Service – 60 Yr (\$millions)	317.627

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10 **Response:**

11 The potential risk reduction associated with the assumptions described in the Information  
12 Request is summarized and characterized by the following Table. As outlined in the  
13 Quantitative Risk Assessment of LMSU Projects (Appendix A-10), the impacts reflect a  
14 reasonable worst case scenario at design conditions.

Segment	Segment Length (km)	Number of Customers Impacted	Maximum Outage Time (days)	Total Impact (million\$)	Probability of Failure (failures/year)	Total Risk (\$/year)
Nichol to Roebuck NPS 24	1.7	252300	24.8	564.83	6.98E-04	394,260
Roebuck to Delta NPS 24/36	7.34 (avg.)	252300	24.8	564.83	7.53E-04	425,116
Delta to Tilbury NPS 24/36	5.34 (avg.)	229600	22.7	477.44	5.19E-04	247,956
Tilbury to Fraser NPS 20/24	9.7 (avg.)	215200	21.4	423.25	9.86E-04	417,121

<sup>19</sup> Note that these results are for Alternative 6 without installation of a NPS 36 Cape Horn to Coquitlam TP loop.

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Segment	Segment Length (km)	Number of Customers Impacted	Maximum Outage Time (days)	Total Impact (million\$)	Probability of Failure (failures/year)	Total Risk (\$/year)
IP Segment 1	4.76	171000	19.8	320.42	1.95E-03	626,243
IP Segment 2	0.92	98200	12.8	132.77	3.78E-04	50,153
IP Segment 3	3.24	14100	8.2	8.5	1.33E-03	11,311
IP Segment 4	0.48	0	0	0	1.95E-04	0
IP Segment 5	1.81	0	0	0	7.43E-04	0
IP Segment 6	1.34	0	0	0	5.50E-04	0
IP Segment 7	0.54	0	0	0	2.22E-04	0
IP Segment 8	2.97	0	0	0	1.22E-03	0
IP Segment 9	0.2	0	0	0	8.21E-05	0
IP Segment 10	3.78	2840	5.6	2.06	1.55E-03	3,193
IP Segment 11	0.68	0	0	0	2.79E-04	0
IP Segment 12	2.98	0	0	0	1.22E-03	0
IP Segment 13	5.15	29,620	8.9	18.05	2.11E-03	38,137
Cape Horn to Coquitlam NPS 20/36	4.6 (avg.)	163,280	16	181.95	4.31E-04	78,420
Port Mann to Cape Horn NPS 36	1.28	163,280	16	181.95	5.26E-04	95,644
Nichol to Port Mann NPS 24	5	172,572	15.8	192.63	2.05E-03	395,471
<b>Total</b>						<b>2,783,025</b>

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2 Given the above risk break-down, the potential risk reduction that is associated with the  
3 hypothetical system reinforcement outlined in the Information request is calculated to be the  
4 difference between the \$3.054 million/year risk associated with today's system and the  
5 remaining risk of \$2.783 million/year following the completion of the Project as described in this  
6 IR. This results in a risk reduction of approximately \$0.271 million/year.

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22.3 Please explain why Alternative 4 has not resulted in Operational Risk Reduction, considering replacing the existing pipeline with an NPS 24 pipeline would be expected to reduce the probability of failure.

**Response:**

DRAS provides the following response:

Based on a review of gas transmission failure incident data, ASME B31.8S “Managing System Integrity of Gas Pipelines” characterizes three groupings of threat categories that apply to natural gas transmission pipelines. One of those threat category groupings is characterized as ‘Time Dependent’, meaning that the magnitude of the threat (and hence, the associated failure frequency) changes with time. For threats such as corrosion, soon after the installation of a pipeline, the likelihood of failure is essentially zero, and this rises with the passage of time. Conversely, other types of failure threats – particularly those associated with equipment failure and outside forces, tend to decrease with the passage of time as the commissioning and initial operating period passes.

Because of the above, any attempt to account for system age in the estimation of failure frequency will cause the introduction of a bias that will cause the estimates to not be representative of the expected failure frequency over the life of the project.

For the purposes of estimating failure frequency, industry failure incident data were selected such that they are as representative as possible as the facilities under consideration (i.e., facilities in an urban environment that are inspected on a regular basis). Age-related bias was intentionally not introduced in the dataset. In this respect, as is stated in the Quantitative Risk Assessment of LMSU Projects (Appendix A-10), the failure rates represent a time-averaged failure rate. Because the same basis for estimating failure frequency was used over all replacement alternatives presented, this provides an equal basis for comparison of each alternative against all others.

22.4 Would FEI consider probability of failure an input to help determine expected failure frequency and total risk appropriate? If not, why not?

**Response:**

DRAS provides the following response:

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Probability of failure is an input into any estimation of failure frequency. In the analysis described in the Quantitative Risk Assessment of LMSU Projects (Appendix A-10), industry incident data were selected in such a manner that the probability of failure (and most specifically, the expected failure frequency) derived from those data is as representative of the facilities under consideration as possible. As discussed in the response to BCUC IR 1.22.3, the failure frequency estimates represent time-averaged failure rates, without any bias that would otherwise cause those estimates to be not representative of expected failure rates over the life of the project.

22.5 Please confirm, otherwise explain, that replacing the existing Coquitlam NPS 20 IP pipeline with an NPS 24 pipeline at 2070kPa would reduce the potential impact of a loss of service event. In other words, confirm, otherwise explain, that for certain failures the number of customers impacted would be reduced because the larger and higher pressure pipeline is installed.

**Response:**

Replacing the existing Coquitlam NPS 20 IP pipeline with a NPS 24 IP pipeline at 2070 kPa would have some effect on reducing the customer impact. Under peak design day conditions, the customer impact for the loss of Fraser Gate, pipeline upstream of Fraser Gate, or the isolation of the IP Segment 1, immediately north of Fraser Gate, would be the same for the existing NPS 20 pipeline or an NPS 24 pipeline. Similarly loss of Coquitlam Gate or pipelines upstream of Coquitlam Gate would result in the same customer impact numbers for either the NPS 20 or NPS 24 pipelines.

Isolation of any other pipeline segments within the IP system would incur customer outages for an NPS 24 pipeline compared with the existing NPS 20 IP pipeline as shown in the table below.

	<b>Affected Customers with Segment Isolated</b>	
	<b>NPS 24 (2070 kPa)</b>	<b>Existing NPS 20 (1200 kPa)</b>
IP Segment 1	171,000	171,000
IP Segment 2	0	98,200
IP Segment 3	0	14,100
IP Segment 4	0	0
IP Segment 5	0	0

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	Affected Customers with Segment Isolated	
	NPS 24 (2070 kPa)	Existing NPS 20 (1200 kPa)
IP Segment 6	0	12,500
IP Segment 7	0	12,500
IP Segment 8	0	0
IP Segment 9	0	0
IP Segment 10	2,840	2,840
IP Segment 11	0	0
IP Segment 12	0	0
IP Segment 13	15,200	29,620

22.5.1 If confirmed, please explain why Alternative 4 has not resulted in Operational Risk Reduction.

**Response:**

Please refer to the response to BCUC IR 1.22.7 for a recalculated Operational Risk.

22.6 Would FEI consider the number of customers impacted an input to help determine the consequence and total risk. If not, why not?

**Response:**

Yes, FEI considers the number of customers impacted to be an input to help determine the consequence and total risk.

22.7 Please update Table 3-3 to account for the expected reduction in failure frequency and consequence that occurs by replacing the existing Coquitlam NPS

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20 IP pipeline operating at 1200kPa with an NPS 24 pipeline operating at 2070 kPa.

**Response:**

FEI has adjusted the economic impacts (consequence) associated with loss of service, to account for the revised customer numbers associated with the IP Segments, as outlined in the response to BCUC IR 1.22.5.

There has been no adjustment to failure frequencies of the segments. As outlined in the response to BCUC IR 1.22.3, the failure frequency estimates that form the basis of the risk analysis presented in Appendix A-10 represent time-averaged failure rates, without any bias that would otherwise cause those estimates to be not representative of expected failure rates over the life of the project. The same basis for estimating failure frequency was used over all replacement alternatives presented; this provides an equal basis for comparison of each alternative against all others.

Table 1 below shows the total operational risk remaining with the Coquitlam Gate IP pipeline upgraded with an NPS 24 pipeline and the Cape Horn to Coquitlam TP Loop installed, based on the assumptions in the BCUC IR 1.22.5.

As per Table 4 of Appendix A-10 of the Application “Loss of Service Risk [operational risk] of Existing Pipeline System Configuration” the operational risk of the existing system “as is” is estimated to be \$3.054MM/year.

As per Table 6 of Appendix A-10 of the Application “Loss of Service Risk [operational risk] with Coquitlam Gate IP Pipeline Upgrade and Cape Horn to Coquitlam TP Loop Installed”, the operational risk remaining is estimated to be \$0.598MM/year. Thus, the proposed NPS 30 Coquitlam Gate IP replacement solution provides an estimated risk reduction of \$2.456MM/year.

As shown in Table 1 below, the operational risk remaining if a NPS 24 pipeline operating at 2070 kPa is installed instead of a NPS 30 pipeline is estimated to be \$2.702MM/year. This Alternative provides an estimated risk reduction of \$0.352MM/year. Table 3.3 in the Application incorrectly shows the reduction in operational risk associated with the installation of a NPS 24 pipeline to be zero. However further analysis has determined that there is a potential for some operational risk reduction as noted.

Table 3-3 has been updated to reflect the operational risk reduction associated with the replacement of the existing Coquitlam NPS 20 IP pipeline operating at 1200 kPa with an NPS 24 pipeline operating at 2070 kPa. The “Revised Table 3.3” is provided below. Line 6 of Table 3-2, page 43 of the Application presents the 60 year Levelized rate impact exclusive of any potential operational risk impacts. It can be seen that the incremental difference in Levelized

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- 1 rate impact between Alternative 6 and Alternative 4 is \$0.014 per GJ. Based on \$0.014 per GJ  
2 and an average annual consumption of 95GJ per residential customer, the annual cost  
3 difference between the two alternatives would be \$1.33 per customer.
- 4 As stated in the Exhibit B-1 (page 45), when taking into account the reduction in operational risk  
5 provided by Alternative 6 compared to Alternative 4, and that Alternative 6 is the only alternative  
6 which meets all of the stated objectives, FEI has selected Alternative 6 as the preferred  
7 alternative.
- 8 Also, please refer to the response to BCUC IR 1.9.2 for a further explanation of the benefits of  
9 the proposed NPS 30 pipeline over the NPS 24 pipeline operating at 2070 kPa.

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**Table 1**

<b>Segment</b>	<b>Segment Length (km)</b>	<b>Number of Customers Impacted</b>	<b>Maximum Outage Time (days)</b>	<b>Total Impact (million\$)</b>	<b>Probability of Failure (failures/ year)</b>	<b>Total Risk (\$/year)</b>
Nichol to Roebuck NPS 24	1.7	252300	24.8	564.83	6.98E-04	394,260
Roebuck to Delta NPS 24/36	7.34 (avg)	252300	24.8	564.83	7.53E-04	425,116
Delta to Tilbury NPS 24/36	5.34 (avg)	229600	22.7	477.44	5.19E-04	247,956
Tilbury to Fraser NPS 20/24	9.7 (avg)	215200	21.4	423.25	9.86E-04	417,121
IP Segment 1	4.76	171000	19.8	320.42	1.95E-03	626,243
IP Segment 2	0.92	0	0	0	3.78E-04	0
IP Segment 3	3.24	0	0	0	1.33E-03	0
IP Segment 4	0.48	0	0	0	1.95E-04	0
IP Segment 5	1.81	0	0	0	7.43E-04	0
IP Segment 6	1.34	0	0	0	5.50E-04	0
IP Segment 7	0.54	0	0	0	2.22E-04	0
IP Segment 8	2.97	0	0	0	1.22E-03	0
IP Segment 9	0.2	0	0	0	8.21E-05	0
IP Segment 10	3.78	2840	5.6	2.06	1.55E-03	3,193
IP Segment 11	0.68	0	0	0	2.79E-04	0
IP Segment 12	2.98	0	0	0	1.22E-03	0
IP Segment 13	5.15	15,200	8.1	8.69	2.11E-03	18,336
Cape Horn to Coquitlam NPS 20/36	4.6 (avg)	163,280	16	181.95	4.31E-04	78,420
Port Mann to Cape Horn NPS 36	1.28	163,280	16	181.95	5.26E-04	95,644
Nichol to Port Mann NPS 24	5	172,572	15.8	192.63	2.05E-03	395,471
<b>Total</b>						<b>2,701,760</b>

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**Revised Table 3-3**

		<b>Alternative 4 Install NPS 24 Pipeline at 2070 kPa</b>	<b>Alternative 6 Install NPS 30 Pipeline at 2070 kPa</b>
1	Potential Operational Risk Reduction Per Appendix A-10 (2014 \$millions/year)	2.456	2.456
2	Operational Risk Reduction (Coquitlam Gate IP Pipeline and Cape horn to Coquitlam TP complete) (2014 \$millions/year)	0.352	2.456
3	Operational Risk Reduction (%)	14.34%	100.0 %
4	Remaining Operational Risk (2014 \$millions/year)(line 1-Line2)*	2.104	0
5	PV Remaining Operational Risk – 60 Yr (\$millions)	33.307	0
6	PV Incremental Cost of Service – 60 Yr (\$millions)	259.659	300.513
7	PV Remaining Operational Risk + PV Incremental Cost of Service – 60 Yr (\$millions)	292.966	300.513

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*\* Based on potential operational risk in line 1*

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22.8 Please provide the detailed methodology and results of the consequence analysis report titled Economic Consequence Analysis of Hypothetical Natural Gas Service Interruptions in the British Columbia Lower Mainland referred to in the DRAS report, and explain and justify all assumptions and values used in both reports.

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**Response:**

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Exhibit B-1-1, Appendix A-5 “Economic Consequence Analysis of Hypothetical Natural Gas Service Interruptions in the British Columbia Lower Mainland” provides the detailed methodology and results of the consequence analysis report referred to in the DRAS report.

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22.9 Please provide and justify the discount rate used to determine the PV 60 year values in Table 3-3.

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1 **Response:**

2 FEI uses the most recently approved after tax weighted average cost of capital (also known as  
3 the AFUDC rate) as the discount rate in present value calculations. As such, the discount rate  
4 used is based on the Appendix A – Amalgamated 2014 Financial Schedules in FEI's October  
5 31, 2014 2015 Common Delivery Rates and Delivery Rate Riders application which the  
6 Commission approved in Order G-178-14

7 The following table restates the detail in Appendix A of the October 31 application and  
8 calculates the after tax WACC used to determine the PV 60 year values in Table 3-3.

FEU AMALGAMATED CAPITAL STRUCTURE & COST OF CAPITAL

	Appendix A, Schedule 28		Appendix A, Schedule 11		
	Average				
	Capital	Embedded	Cost		After Tax
	Structure	Cost	Component	1 - Tax Rate	WACC
Long-Term Debt	53.92%	6.65%	3.59%	74%	2.65%
Unfunded Debt	7.58%	2.12%	0.16%	74%	0.12%
Common Equity	<u>38.50%</u>	8.75%	<u>3.37%</u>		<u>3.37%</u>
Total	100.00%		7.12%		6.14%

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13 22.10 Please justify using a 60-year discount period in the PV analysis.

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15 **Response:**

16 The period is consistent with the expected economic life of pipelines, i.e. 60 years.

17

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**23.0 Reference: Coquitlam Gate – Cost Risk Analysis**

**Exhibit B-1**

**Biggest Impacts on the Project Cost and Risks**

23.1 Please confirm that the trenchless and trenched costs will have the biggest impact on the Coquitlam Gate project cost and risk and discuss what measures FEI is taking to minimize these costs and risks.

**Response:**

The cost risk analysis completed for the Coquitlam Gate IP Project is presented in Exhibit B-1, confidential Appendix A-27. The AACE Class 3 base cost estimate (2014\$, excluding contingency, escalation and AFUDC) was used as the basis of the risk analysis. Together, trenched and trenchless construction components total approximately 58% of the base cost estimate. These construction components are identified as the key risk drivers for the overall Project capital cost, and are confirmed as having the largest potential impact on the project cost.

The cost risk analysis was developed at a Class 3 level of project definition stage, and the risk ranges and probabilities assigned to the pipeline trenched and trenchless construction were based on FEI expertise and judgment and on understanding of the scope definition and risk profile. The detailed engineering phase of the Project will commence after approval of CPCN, and include a suite of site investigations and site surveys which will further inform the Project team in terms of sub-surface uncertainty and risk. At the trenchless locations in particular, deeper boreholes, down-hole testing, sampling and off site lab testing and geophysical profiling will be utilized to build a complete picture of the sub-surface conditions. As the project develops, the detailed design and routing and construction planning, including specifications, procedures and methodologies will be developed and tailored to mitigate identified risks associated with trenched and trenchless pipeline construction and installation where feasible, based on the site investigations findings and analysis. Residual risk that cannot be mitigated through existing controls or a risk treatment plan will be mitigated through appropriate contingency allocation.

FEI will also employ project, contract and cost management practices and techniques to manage scope, cost and risk. For further details pertaining to how these measures will be utilized to minimize cost and risks please refer to the responses to BCOAPO IRs 1.5.2 and 1.5.3.

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1 **F. ACCOUNTING – COQUITLAM GATE**

2 **24.0 Reference: Project Costs and Accounting Treatment**

3 **Exhibit B-2, Slide 22; FEI Multi-year Performance Based Ratemaking**  
 4 **(PBR) plan for the years 2014–2018 Decision (FEI PBR Decision), p.**  
 5 **182;**

6 **CPCN Savings and O&M savings in PBR**

7 Regarding the existing Coquitlam Gate IP, FEI states that weekly leak detection and  
 8 repair are conducted to mitigate safety risk.<sup>20</sup>

9 The Panel recommends that, if capital associated with a particular CPCN is  
 10 excluded from the formula, the CPCN review of that project should include an  
 11 assessment by the Commission of any potential impact of the project on O&M. If  
 12 appropriate, an adjustment to the formula based O&M spending envelope should  
 13 then be made.<sup>21</sup>

14 24.1 Please provide the 2013–2014 leak detection and repair costs for the existing  
 15 Coquitlam Gate IP by year and confirm that these costs were included in the  
 16 2013 Approved and 2014 FEI formula based O&M spending envelope.

17 **Response:**

18 Not confirmed. As outlined in the Evidentiary Update filed on February 21, 2014, the 2013 base  
 19 O&M did not include the 2013 actual and unplanned leak repair and survey costs provided in  
 20 the table below.<sup>22</sup> However, FEI confirms that \$69.2 million of operations O&M was embedded  
 21 in the 2013 base for the 2014-2019 PBR and this amount would have included the standard  
 22 annual leak survey costs for the entire FEI distribution system.<sup>23</sup> Thus, it is important to note  
 23 that the 2013 base O&M embedded in the PBR formula, which will only be escalated or de-  
 24 escalated each year according to the approved inflation, productivity and growth factors does  
 25 not consider the higher leak repair or survey costs experienced in 2013 or higher costs in the  
 26 future that would likely be incurred with respect to the NPS20 Coquitlam Gate IP pipeline in  
 27 absence of this Project.  
 28

<sup>20</sup> Exhibit B-2, Slide 22.

<sup>21</sup> FEI PBR Decision, p. 18.

<sup>22</sup> Exhibit B-1-5, FEI 2014-2018 PBR Plan Application Evidentiary Update dated February 21, 2014, p.3 and approved by Order G-138-14.

<sup>23</sup> Exhibit B-1-5, FEI 2014-2018 PBR Plan Application Evidentiary Update dated February 21, 2014, Attachment 5, p.4.

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Description	2013 Actuals	2014 Preliminary Actuals
Leak Repairs – NPS 20 Coquitlam Gate IP pipeline	\$775,598	\$62,715
Incremental Leak Survey (costs above and beyond the standard annual leak survey) – NPS 20 Coquitlam Gate IP pipeline	\$11,048	\$36,028

These costs are consistent with those reported in the response to BCUC IR 1.1.1.9.

24.1.1 Please provide all other FEI O&M savings resulting from the Coquitlam Gate IP Project by year from 2018–2019.

**Response:**

FEI does not expect any O&M savings resulting from the Coquitlam Gate IP Project. FEI is forecasting incremental O&M resulting from the Coquitlam Gate IP Project over a 60-year assessment period. This is related to:

- Internal labour costs for pressure safety valve (PSV) and valve inspections, and instrument and meter maintenance of \$15 thousand per year (2014\$);
- Internal labour costs for corrective valve maintenance of \$10 thousand per year (2014\$);
- Contractor costs for vegetation maintenance and leak survey of \$3 thousand per year; and
- Incremental facilities operating lease charges of \$28 thousand per year.

Aside from Facilities charges, as the Coquitlam Gate IP Pipeline is scheduled to be placed in service in November 2018, FEI has not forecast incremental O&M in 2018. As the existing 2<sup>nd</sup> & Woodland facilities will be demolished in 2018, contract meter readers would be relocated to a nearby facility that FEI would lease starting in 2018.

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24.2 Does FEI agree that the formula based O&M spending envelope should be adjusted for savings due to the Coquitlam Gate IP? Please explain why, or why not.

**Response:**

No, the justification for the Coquitlam Gate IP Project is premised on safety and reliability and O&M savings associated with this project are not expected. Therefore, there is no basis on which the formula O&M spending could be reduced.

Please also refer to the response to BCUC IR 1.24.1.

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**25.0 Reference: Project Costs And Accounting Treatment**

**Exhibit B-1, Section 1.1, p. 1**

**Asset Gains/Losses**

On page 1 of the Application FEI requests to:

...Construct and operate a new Nominal Pipe Size (NPS) 30 IP pipeline operating at 2070 kPa between Coquitlam Gate Station and East 2nd & Woodland Station to upgrade and replace an existing NPS 20 IP pipeline...<sup>24</sup>

25.1 Please provide the gain/loss on the replacement of the existing NPS 20 IP pipeline by asset class, included the original cost of the assets and the accumulated depreciation.

**Response:**

FEI's records do not have an original cost for the existing NPS 20 Coquitlam Gate IP pipeline; however, using the allocation provided in the response to BCUC IR 1.41.1, the following table shows the cost and accumulated depreciation for the IP pipe (Plant Account 475 – Distribution Mains) being retired in Coquitlam, Burnaby and Vancouver.

	Gross Plant Cost	Accumulated Depreciation	Net Book Value
Coquitlam	\$ 99,994	\$ (40,308)	\$ 59,686
Burnaby	420,314	(164,213)	256,101
Vancouver	<u>2,175,053</u>	<u>(975,720)</u>	<u>1,199,333</u>
Total 20" IP	<u>2,695,361</u>	<u>(1,180,241)</u>	<u>1,515,120</u>
Other DP Pipe Retirement			
Coquitlam	2,375	(1,315)	1,060
Burnaby	<u>14,477</u>	<u>(8,017)</u>	<u>6,460</u>
Total Other	<u>16,852</u>	<u>(9,332)</u>	<u>7,520</u>
Total	\$2,712,213	\$ (1,189,573)	\$ 1,522,640

The Commission Decision dated September 15, 2014 regarding FEI's PBR application on page 246 directed, "FEI to discontinue use of the Gains and Losses deferral account, effective

<sup>24</sup> Exhibit B-1, p. 1.



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- 1 January 1, 2014". Consequently, estimated gains or losses will reside in the Accumulated
- 2 Depreciation account.
- 3



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**26.0 Reference: Project Costs And Accounting Treatment**

**Exhibit B-1, Section 3.3.3.6, p. 62**

**Existing ROW**

FEI on page 62 of the Application explains:

The proposed NPS 30 Coquitlam Gate IP pipeline preferred route option is detailed in section 3.3.4. The majority of this alignment will also be located within road allowance which will not require permanent ROW. However, there is a short section of the route alignment, approximately 70 m, which will require new land and access rights.<sup>25</sup>

26.1 If the proposed NPS 30 Coquitlam Gate IP pipeline preferred route option is constructed will parts of the existing Coquitlam Gate IP pipeline ROW cease to be used for utility service? If yes, please provide the value of the ROW that will cease to be used.

**Response:**

There is no formal right of way agreement pertaining to the Coquitlam Gate IP pipeline. This is because the existing Coquitlam Gate IP pipeline is wholly within road allowance, and as the untitled road allowance is held publicly under the jurisdiction of the respective municipalities, there is no formal right of way agreement required. As such, the pipeline exists in the road allowances under terms of the respective operating agreement and no direct fees are attributable, and there will be no value released.

---

<sup>25</sup> Exhibit B-1, p. 62.

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1    **27.0    Reference:    Project Costs and Accounting Treatment**

2                                    **Exhibit B-1, Section 9.4, p. 187**

3                                    **Rate impact**

4                    27.1    Please show the calculation of the Coquitlam Gate IP Project in Table 9-6.  
5                                    Include the requested information in the form of a fully functioning electronic  
6                                    spreadsheet.

7  
8    **Response:**

9    The following table summarizes the calculation of the approximate rate impact in 2019 and for  
10 the 60 Year Levelized Average.

		Coquitlam Gate IP Project	
		PV of Incremental	
		2019	Revenue
	Incremental Revenue Requirement	\$ 22,958	\$ 300,513
	Annual Volume	187,832	2,974,080
	2019 Average Delivery Impact &		
11	Levelized Average Delivery Impact \$ / GJ	\$ 0.122	\$ 0.101

12    The fully functional electronic spreadsheet that contains the details of the calculations was filed  
13    with the Commission as an attachment to Confidential Appendix E-1-1. In the Excel file, the  
14    details summarized in Table 9-6 and in the table above are in the Tab labelled "Levelized Rate  
15    Calculation".

16

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**G. PROJECT NEED AND JUSTIFICATION – FRASER GATE**

**28.0 Reference: Fraser Gate IP**

**Exhibit B-1, Section 4.1, 4.3.3.2.2, pp. 102–103**

**Project Justification**

FEI identifies the Fraser Gate pipeline as a single point of failure pipeline. Emergency repairs require a section of this pipeline to be shut down.

28.1 How frequent (per annum) does FEI experience emergency shut downs on the Fraser Gate pipeline? How many emergency shut downs would FEI expect in the 20-year planning horizon?

**Response:**

Over the operating history of the NPS 30 Fraser Gate IP pipeline, FEI has not experienced any emergency shutdowns.

In the Dynamic Risk Quantitative Risk Assessment of the LMIPSU Projects, included as Appendix A-10, an outage frequency of  $4.106 \times 10^{-4}$  failure / km–yr was estimated. Based on this outage frequency there is a 7.4% probability of at least one emergency shutdown on the NPS 30 Fraser Gate IP pipeline over the 20 year planning horizon.

28.1.1 How many of these shut downs are/expected to be related to third party damage and how many are/expected to be related to maintenance issues?

**Response:**

The Dynamic Risk Quantitative Risk Assessment of LMIPSU Projects, included as Appendix A-10 of the Application, did not include an estimate of failure causes. FEI expects the most common reason for an emergency shutdown of the NPS 30 Fraser Gate IP pipeline would be third-party damage.

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28.1.2 Taking into consideration the position of shut down valves on the Fraser Gate pipeline and the current connection to the Coquitlam line, please list all the possible sectional (valve to valve) outage scenarios and the corresponding amount of customers affected with each section. Please also provide this list for the end of the 20-year planning horizon.

**Response:**

The following table of Metro IP Schematic summarizes the breakdown of customer outages associated with each possible segment isolation presently and at the end of the 20-year planning horizon under peak hour design conditions. Please note that, other than a Segment 1 or Segment 13 isolation (where the supply from Fraser Gate or Coquitlam Gate respectively is fully isolated from the system), all other segment isolations allow some support from both stations and this has an effect on reducing or eliminating customer outages in these segments.

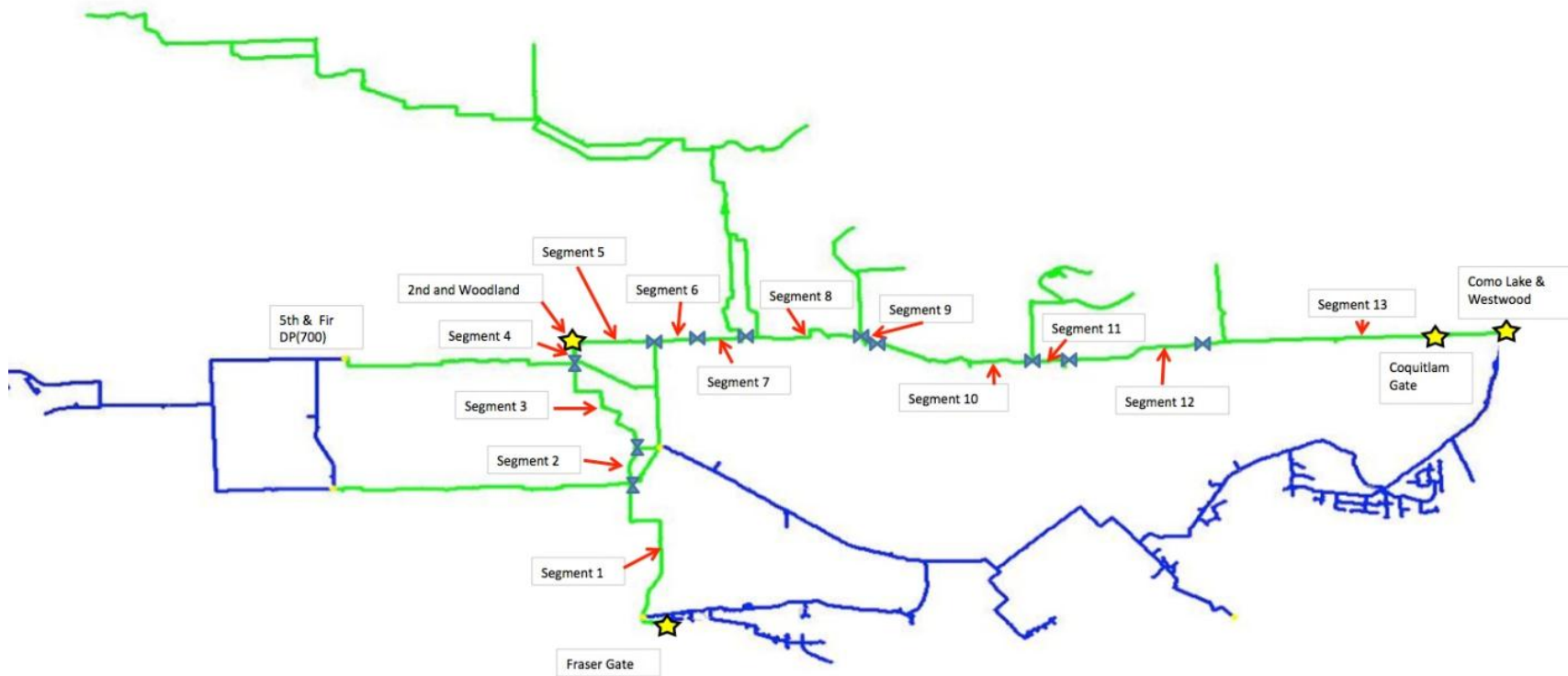
**Customer Outage Impacts Resulting from Isolation of IP Segment Using Existing Valves**

Segment	Segment Description	Customer Outage Impacts - 2014	Customer Outage Impacts - 2034
IP Segment 1	Fraser Gate to E 37th Ave and Nanaimo	171,000	209,800
IP Segment 2	E 37th Ave and Nanaimo St to E 29th Ave and Nanaimo	98,200	170,000
IP Segment 3	E 29th Ave and Nanaimo to E 7th Ave and Woodland Dr	14,100	23,750
IP Segment 4	E 7th Ave and Woodland Dr to E 2nd Ave and Woodland Dr	0	0
IP Segment 5	E 2nd and Woodland Dr to E 2nd Ave and Slocan St	0	0
IP Segment 6	E 2nd and Slocan St to E 2nd and Cassiar St	12,500	16,060
IP Segment 7	E 2nd Ave and Cassiar St to E 2nd and Boundary Rd	12,500	16,060
IP Segment 8	E 2nd Ave and Boundary Rd to Halifax St and Springer Ave	0	0
IP Segment 9	Halifax St and Springer Ave to Broadway and Springer Ave	0	0
IP Segment 10	Broadway and Springer Ave to Broadway and Arden Ave	2,840	29,200
IP Segment 11	Broadway and Arden Ave to Broadway and Underhill Ave	0	32,900
IP Segment 12	Broadway and Underhill Ave to Como Lake Ave and Clarke Rd	0	52,400
IP Segment 13	Como Lake Ave and Clarke Rd to Coquitlam Gate/Como Lake and Westwood Stations	29,620	82,000

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1

**Schematic of Metro IP System Showing Isolation Segments**



2

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28.1.2.1 In determining the number and location of isolation valves,  
does FEI consider the number of customers in each section?  
If so, what criteria does FEI use and why? If not, why not?

**Response:**

FEI does not have defined criteria specifying numbers of customers in determining isolation valve locations on IP systems, but does consider the customer impacts in assessing valve requirements. The proposed replacement of the NPS 30 Coquitlam IP line will include a number of main line block valves as described in Exhibit B-1, Section 3.3.3.3.4 of the Application. They will serve as a means to isolate the whole line or individual sections of the line, if required during normal operation and maintenance or in case of emergencies. The valve siting and location will enable timely shut down of the line in an emergency; the spacing of these valves will be determined during detailed design studies that will consider the operating pressure and size of the pipeline and the number and type of customers that could be affected, ensuring that the objective of maintaining full system resiliency remains.

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**29.0 Reference: A Primary Source of Gas Supply to Metro Vancouver**

**Exhibit B-1, Section 3.1.2.1, p. 15 and Section 4.1.2.3, p. 103**

**Leak History and Condition of the Fraser Gate to 2nd and Woodland  
NPS 30 Pipeline**

The utility states on pages 15 and 103 respectively that both the NPS 20 IP pipeline from Coquitlam Gate station and the NPS 30 IP pipeline from Fraser Gate station were installed in 1958 and are parts of the 1200 kPa IP system.

29.1 Please provide a list of leaks on the NPS 30 Fraser Gate to 2nd and Woodland pipeline over the period from 1987 through 2014 and the kilometre post location of each leak, identify any that were not due to external corrosion at girth welds, outline how each leak was repaired and, where possible, provide an estimate of the quantity of gas released by each leak.

**Response:**

Based on FEI's records, there have been no documented leaks on the NPS 30 Fraser Gate to 2<sup>nd</sup> and Woodland IP pipeline over the period from 1987 through 2014.

29.1.1 Please compare the leak history of the NPS 30 Fraser Gate IP pipeline to that of the NPS 20 Coquitlam IP pipeline.

**Response:**

A search of FEI's records has revealed no documented leaks on the NPS 30 Fraser Gate IP pipeline since installation. In contrast, the NPS 20 Coquitlam Gate IP pipeline has experienced 15 documented leaks since installation.

29.1.2 Please outline the coating system used on the NPS 30 pipeline and compare it to the coating on the NPS 20 pipeline.

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1    **Response:**

2    The coating system used on both the NPS 30 Fraser Gate and NPS 20 Coquitlam Gate IP  
3    pipelines is factory-applied coal tar enamel and field-applied coal tar enamel on girth welds.  
4    Excavations to-date on the NPS 30 Fraser Gate IP pipeline revealed differences compared to  
5    the NPS 20 Coquitlam Gate IP pipeline. Inspections of the NPS 30 Fraser Gate IP showed  
6    appropriate coating thickness and significantly improved adhesion of the field-applied girth weld  
7    coating as compared to the NPS 20 Coquitlam Gate IP pipeline.

8    Differences could be due to several factors, however long-term coating performance is  
9    considered as being primarily influenced by surface preparation, environmental conditions  
10   during application, and the quality of the application (e.g. thickness and uniformity).

11

12

13

14                   29.1.3   Please outline the cathodic protection system and performance on the  
15                               NPS 30 pipeline and compare it to the system and performance on the  
16                               NPS 20 pipeline.

17

18    **Response:**

19   The NPS 20 and NPS 30 pipelines are both cathodically protected by Impressed Current  
20   Cathodic Protection systems.

21   Based on limitations associated with historical cathodic protection (CP) data for each pipeline, it  
22   is difficult to draw a definitive conclusion as to the performance of the cathodic protection  
23   systems over the life of both pipelines. However, based on observations during excavations of  
24   both the existing NPS 20 IP pipeline from Coquitlam Gate station and the NPS 30 IP pipeline  
25   from Fraser Gate station, there has been evidence of effective CP where the pipe has not been  
26   “shielded” from CP. This evidence is in the form of observed minimal or lack of corrosion at the  
27   given sites, and the presence of calcareous deposits (a by-product of CP).

28

29

30

31                   29.1.4   Assuming that the NPS 30 pipeline has had fewer leaks than the NPS  
32                               20 pipeline, please discuss broadly the reasons to explain the  
33                               difference.

34



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**Response:**

As stated in the response to BCUC IR 1.29.1, there are no leaks documented on the NPS 30 Fraser Gate IP pipeline. This is due to the quality of the field-applied girth weld coating installation during original construction on the NPS 30 Fraser Gate IP pipeline, which was different from the quality observed on the NPS 20 Coquitlam Gate IP pipeline.

29.1.5 Please confirm that, except for the section of pipeline at the outlet of the Fraser Gate station that FEI has applied to upgrade, all of the NPS 30 Fraser Gate IP pipeline can withstand a 1:2475 seismic event, or explain otherwise and state the severity of seismic event that it can withstand.

**Response:**

The entire NPS 30 IP pipeline from Fraser Gate station to East 2<sup>nd</sup> & Woodland, except for the section of pipeline at the outlet of the Fraser Gate station that FEI has applied to upgrade (subject to potential optimization, as discussed in the response to BCUC IR 1.31.3.1), has been assessed as meeting the FEI seismic criteria of resistance to a 1:2475 seismic event.

29.1.6 Please describe the steps that FEI has taken to assess the condition of the NPS 30 pipeline.

**Response:**

In general, FEI does not undertake detailed condition assessments of IP pipelines in the absence of a leak history. However, given the recognized importance of the NPS 30 pipeline from a security of supply perspective and the potential for construction similarities to the NPS 20 Coquitlam Gate IP pipeline (due to similar time period of installation and use of the same coating types), FEI has undertaken corrosion-related assessments of the NPS 30 Fraser Gate IP pipeline.

The Company completed a detailed cathodic protection (CP) evaluation survey of the NPS 30 pipeline in late 2010. This survey included close interval CP potentials, AC current attenuation, depth of cover, and GPS alignment. Results from the survey were used to select dig locations.

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1 In 2013 and 2014, a total of six integrity excavations were conducted on the NPS 30 Fraser  
2 Gate IP pipeline, exposing a total of 18 girth welds and approximately 170 metres of pipe. The  
3 pipe and coating at these locations were generally in excellent condition.

4  
5  
6  
7 29.1.6.1 What is the condition of the NPS 30 pipeline and when does  
8 FEI expect it will reach the end of its service life and need to  
9 be replaced?

10  
11 **Response:**

12 Based on leak history and the results of the condition assessment activities described in the  
13 response to BCUC IR 1.29.1.6, the condition of the NPS 30 Fraser Gate IP pipeline does not  
14 appear to require corrosion-related replacement within FEI long-term capital planning forecasts.

15  
16  
17  
18 29.1.6.2 If the NPS 30 pipeline is replaced, does FEI expect the new  
19 pipeline will operate at 2070 kPa?

20  
21 **Response:**

22 If, in the future, the Fraser Gate IP pipeline is identified as requiring replacement, FEI would  
23 consider alternatives at that time which may include an assessment of an upgrade to 2070 kPa.

24

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**30.0 Reference: Fraser Gate IP**

**Exhibit B-1, Section 4.1.2.1, pp. 102-3; Exhibit B-1-1, Appendix A-4, Appendix 1 (Golder Report), pp. 4–9, Table 6-2, Figures 4-1, 5-1, 6-5  
Seismic Risk to Fraser Gate IP Pipeline**

The utility states on page 102 that the Fraser Gate IP Project involves the replacement of approximately 500 metres of NPS 30 pipeline at the outlet of the Fraser Gate station that does not meet FEI's seismic criteria of resistance to ground displacement during an earthquake with a 1:2475 return period.

The Golder Report states on page 4 that a geological/geotechnical profile illustrating the inferred soil stratigraphy was developed based on the data from test holes put down at the Fraser Gate station site, as shown on Figure 5-1 as Section A-A'.

30.1 Please explain why Figure 4-1 shows Section A-A' as shown as lying approximately 150 metres west of the Fraser Gate station site.

**Response:**

Golder Associates Limited provides the following response:

The subsurface conditions were judged to be similar within the pipeline segment some distance east of AH95-2 and west of Fraser Gate station, shown as Section A-A'. The geological/geotechnical profile at Section A-A' was considered as a representative section for the purpose of estimating lateral ground displacements for pipeline evaluation based on the following:

- Competent ground comprising dense soils was inferred to be sloping down from AH95-2 to the Fraser Gate station based on the test holes put down at the site and was assumed to be at a deeper depth (i.e. approximately 10 m) within this pipeline segment resulting in deeper extent of potentially liquefiable overburden soils and conservative estimate of lateral ground displacements; and
- It is accepted practice in geotechnical engineering to infer subsurface information from nearby areas which are considered to have similar geological formations and topography.

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1                    30.1.1 Does FEI and Golder Associates believe Section A-A' accurately  
2                    represents the soil stratigraphy at the location where Section A-A' is  
3                    shown on Figure 4-1?  
4

5                    **Response:**

6                    Note this response was prepared jointly by Golder Associates Limited and FEI technical staff.

7                    FEI and Golder Associates Limited believe that accepted geotechnical engineering practice was  
8                    followed to represent the soil stratigraphy at the location where Section A-A' is shown. Please  
9                    also refer to the response to BCUC IR 1.30.1 for further details.

10

11

12

13                    30.1.2 If the answer to the previous question is yes, please explain the factual  
14                    evidence that supports this belief.

15

16                    **Response:**

17                    Please refer to the response to BCUC IR 1.30.1.

18

19

20

21                    30.2 Please confirm that the Maximum Lateral Displacement in a 1:2475 event of 1.6  
22                    metres shown in Table 6-2 applies for Section A-A', or otherwise explain.

23

24                    **Response:**

25                    Confirmed. The Maximum Lateral Displacement in a 1:2475 event of 1.6 metres shown in Table  
26                    6-2 applies for Section A-A'.

27

28

29

30                    30.2.1 Please clarify whether the calculated displacement of 1.6 metres  
31                    applies for "pipeline Segment A" as shown on Figure 6-5, or explain  
32                    otherwise.  
33



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1 **Response:**

2 Confirmed. The calculated displacement of 1.6 metres applies for “pipeline Segment A” as  
3 shown in Figure 6-5.

4

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**31.0 Reference: Fraser Gate IP**

**Exhibit B-1, Section 4.1.2.1, pp. 102-103; Exhibit B-1-1, Appendix A-4, Appendix 1 (Golder Report), pp. 4-9, Table 6-2, Figures 4-1, 5-2**  
**Portion of Fraser Gate IP Pipeline at Seismic Risk**

The utility states on page 102 that the Fraser Gate IP Project involves the replacement of approximately 500 metres of NPS 30 pipeline at the outlet of the Fraser Gate station that does not meet FEI's seismic criteria of resistance to ground displacement during an earthquake with a 1:2475 return period.

The Golder Report states on page 4 that earthquake-induced hazards are not considered to pose a significant threat to the pipeline where firm ground is very near the surface, and on page 5 states that since the firm ground is very near the surface in the vicinity of Section B-B' no further site-specific geotechnical analyses were considered necessary.

31.1 The Golder Report states on page 4 that Section B-B' on Figure 5-2 illustrates the inferred soil stratigraphy at the western extent of the site; does FEI have any concerns about the validity of this geological/geotechnical profile?

**Response:**

Note this response was prepared jointly by Golder Associates Limited and FEI technical staff.

FEI and Golder Associates Limited believe that accepted geotechnical engineering practice was followed to interpret the stratigraphy at the western extent, especially at the existing pipeline and north of the existing pipeline. Note that competent ground appeared to be shallow and sloping up towards SE Marine Drive based on the test holes put down along Elliott Street. Similar subsurface conditions are inferred to be present north of the railway tracks across the site considering the subsurface conditions encountered at AH95-2 and the topography.

31.1.1 Please confirm that Section B-B' is shown where the NPS 30 Fraser Gate IP pipeline crosses the railway tracks, or explain.

**Response:**

Confirmed. Section B-B' is at the location where the pipeline crosses the railway tracks.

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31.1.2 Looking at Figure 4-1 of the Golder Report, please confirm that Test Hole AH95-2 was located east of Section B-B' and very close to where the NPS 30 pipeline turns north to cross the railway tracks, or explain otherwise.

**Response:**

Confirmed. The test hole AH95-2 was located east of Section B-B' and very close to where the NPS 30 Fraser Gate IP pipeline turns north to cross the railway tracks.

31.2 Further to the referenced statements on pages 4 and 5 of the Golder Report, does FEI agree that earthquake-induced hazards do not pose a threat to the pipeline from the location of Test Hole AH95-2 onward to the west and north? If not, explain otherwise.

**Response:**

FEI has revisited its prior understanding of the specific area of seismic vulnerability. It has been determined that earthquake-induced hazards do not pose a threat to the pipeline from the location of Test Hole AH95-2 onward to the west and north. As a corollary to the discussion included in the response to BCUC IR 1.30.1, the point where earthquake-induced hazards do not pose a threat to the pipeline is considered to be at some distance east of Test Hole AH95-2.

31.2.1 Further to Table 6-2 on page 9 of the Golder Report, please confirm that the Maximum Lateral Displacement of 1.6 metres for a 1:2475 event does not apply at section B-B', or explain otherwise.

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1    **Response:**

2    It is confirmed that the maximum lateral displacement of 1.6 metres for a 1:2475 event does not  
3    apply at section B-B'.

4  
5

6  
7           31.3   Please clarify whether FEI considers that the existing NPS 30 pipeline in the  
8               vicinity of Test Hole AH95-2 meets its seismic criteria, and explain the response.

9

10   **Response:**

11   Please refer to the response to BCUC IR 1.31.2.

12  
13

14  
15               31.3.1   If FEI proposes to replace a material amount of pipeline that meets its  
16                       seismic criteria, please explain why.

17

18   **Response:**

19   Please refer to the response to BCUC IR 1.31.4.

20  
21

22  
23           31.4   Please discuss whether it would be prudent and cost-effective to do two or more  
24               test holes along the existing pipeline between test holes CPT95-2 and AH95-2, in  
25               order to determine where the soil conditions change from the conditions at Fraser  
26               Gate station to those at Section B-B'.

27

28   **Response:**

29   FEI has revisited its prior understanding of the specific area of seismic vulnerability.

30   Given the response to BCUC IR 1.31.2, FEI has assessed that further test holes are warranted  
31   to determine where the soil conditions change from the conditions at Fraser Gate station to  
32   those at Section B-B' (please see the response to BCUC IR 1.37.1). The Company expects  
33   that additional subsurface information will facilitate FEI's optimization of the extent of the





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- 1 pipeline that needs to be replaced to meet the seismic demand based on technical
- 2 considerations.
- 3 FEI intends to conduct further test hole studies, and review and revise the scope and estimate
- 4 for the pipeline replacement in this area. The Company proposes to include additional
- 5 information on this scope optimization in the Evidentiary Update to be filed in late April.
- 6

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1     **H.     PROJECT ALTERNATIVES – FRASER GATE**

2     **32.0   Reference:   Alternatives Description and Alternative Evaluations**

3                     **Exhibit B-1, Sections 4.2.2, 4.2.3, Table 4-1, pp. 107–110**

4                     **Alternatives to Project as Proposed**

5             The utility states on page 108 that a pipeline replacement is the only technically viable  
6             alternative that meets the Project objectives.

7             32.1   Please discuss whether pipeline replacement from Fraser Gate station to where  
8             the NPS 30 IP pipeline turns north (i.e. in the vicinity of Test Hole AH95-2) is a  
9             technically viable alternative.

10

11     **Response:**

12     Subject to detailed design, and the work described in the response to BCUC IR 1.31.4, FEI  
13     considers this to be a technically viable alternative, as it meets the Project objectives (i.e.  
14     seismic risk reduction, etc.) and is considered constructible.

15

16

17

18             32.1.1   Please undertake an analysis of this alternative similar to that in Section  
19             4.2.3, and expand Table 4-1 to include information about this  
20             alternative.

21

22     **Response:**

23     Please refer to the response to BCUC IR 31.4 for the process that FEI will follow to optimize the  
24     length of pipeline to be replaced in this area.

25     FEI considers this alternative to achieve the same objectives as the Pipeline Replacement  
26     solution already contained in Table 4-1 as Alternative 2.

27

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**33.0 Reference: ALTERNATIVE SOLUTIONS**

**Exhibit B-1, Section 4.2, pp. 106–110; Exhibit B-1-1, Appendix A-4,  
Appendix 1 (Golder Report), p. 11**

**Alternatives to Project as Proposed**

The Golder Report on page 11 refers to a ground improvement program using the vibro-replacement stone column installation method that was used to improve the liquefaction resistance of the site soils at the Fraser Gate station.

33.1 Please outline the vibro-replacement stone column installation method and explain how this program addresses a liquefaction problem.

**Response:**

Golder Associates Limited provides the following response:

Liquefaction occurs in granular soils under strong seismic shaking when the granular soils are loose. Relative density is an in-situ measurement to assess the state of the granular soils from loose to dense. Ground improvement programs are generally used to increase the in-situ relative density to minimize the potential liquefaction of the soils.

The vibro-replacement stone column method involves installation of stone columns within potentially liquefiable soils to increase the relative density. The stone columns are generally 0.9 m in diameter and installed at 2.5 m centre to centre equilateral triangle spacing and built using 40 mm to 75 mm minus crushed stones.

33.1.1 Was the referenced program carried out at Fraser Gate station? If so when, and was it considered successful?

**Response:**

Note this response was prepared by Golder Associates Limited, and reviewed by FEI technical staff.

Vibro-replacement stone column installation was carried out at Fraser Gate station in 1997. In addition, the shoreline was also re-configured to a flatter slope as part of the improvement work.

The program was considered successful to prevent the earthquake induced hazards that were identified at that time. In addition, the program prevents large lateral ground movements of the

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1 north bank towards the Fraser River under the latest seismic hazard models that are considered  
2 by FEI.

3  
4

5

6

33.1.1.1 Please confirm that the Fraser Gate station can withstand a  
1:2475 seismic event, or explain otherwise and state the  
severity of seismic event that it can withstand.

8

9

10 **Response:**

11 As discussed in the response to BCUC IR 1.33.1.1, vibro-replacement stone column  
12 installation carried out at Fraser Gate station in 1997 was considered successful to prevent the  
13 earthquake induced hazards that were identified at that time.

14 However, more recent assessment has identified an additional seismic vulnerability at the  
15 Fraser Gate Station. An evaluation performed in 2014 resulted in a set of recommendations  
16 for modifications to a small component of the station to achieve the FEI performance  
17 requirements for a 1:2475 seismic event. Subsequent planning is in progress for this  
18 mitigation, and it is not currently scheduled. Costs will be managed within the sustainment  
19 budget.

20

21

22

23

33.1.1.2 If a 1:2475 seismic event occurs, how much lateral  
displacement is expected at the Fraser Gate station and how  
much lateral displacement is expected at the NPS 30 pipeline  
near the outlet of the station?

26

27

28

**Response:**

29 Note this response was prepared by Golder Associates Limited, and reviewed by FEI technical  
30 staff.

31 The displacement at Fraser Gate station is expected to be in the order of 0.5 m. No significant  
32 movements are expected at the outlet of the station.

33

34

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33.1.2 Is the vibro-replacement stone column installation method or a similar ground improvement program a technically viable alternative to manage the seismic risk to the NPS 30 IP pipeline?

**Response:**

FEI did not consider an alternative involving ground improvement due to FEI's understanding that it would have a significantly higher cost and larger construction footprint, and therefore result in more community/stakeholder, environmental, and engineering and technical impacts. Furthermore, the additional effort to excavate, inspect and potentially repair the existing NPS 30 IP pipeline (given the vintage of this pipeline) would offer no advantage over the NPS 30 IP pipeline replacement alternative proposed by FEI on the basis that:

- The existing pipeline would be fully excavated and exposed to facilitate visual and non-destructive examinations, this would require a large excavation to accommodate the inspection personnel and equipment and allow full circumferential and longitudinal examination of the pipeline;
- It is expected that existing pipeline welds would be x-rayed to confirm they meet current FEI standards; given the vintage of the pipeline there is a potential that they would require repair involving shut down of the pipeline and venting and purging of gas;
- Any other integrity issues identified by visual or non-destructive examinations would require repair;
- Ground improvements would be required within Riverfront Park, at the river bank, and at nearby offshore areas. This would result in construction complexities such as a temporary park closure and overwater work in an environmentally sensitive area resulting in a larger environmental footprint compared to pipeline replacement; and
- Ground improvement work could present potential liabilities associated with impact to nearby third-party assets (e.g. roads, buildings, rail line, and buried utilities).

33.1.3 If ground improvement is a technically viable alternative, please compare it to the proposed pipe replacement in terms of project impacts and cost.

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1 **Response:**

2 As described in the response to BCUC IR 1.33.1.2, FEI did not consider an alternative involving  
3 ground improvement because the effort to excavate, inspect and potentially repair the existing  
4 NPS 30 IP pipeline would offer no advantage over the NPS 30 IP pipeline replacement  
5 alternative proposed by FEI and FEI believes this option would be more costly, have a larger  
6 construction footprint and therefore result in more community/stakeholder, environmental, and  
7 engineering and technical impacts.

8 For these reasons noted in the response to BCUC IR 1.33.1.2, FEI did not complete a more  
9 detailed financial assessment. An indicative cost for ground improvement work, based on  
10 Golder's past experience of similar seismic remediation projects involving installation of stone  
11 columns using the vibro-replacement method, could be in the order of \$6 million to \$9 million.  
12 This is the direct construction cost only and excludes owner's costs, engineering and other  
13 costs such as project risk contingency, AFUDC and the cost to excavate, examine and repair  
14 the existing section of the Fraser IP pipeline in the seismically vulnerable area. Further ground  
15 improvement project scope definition and cost certainty would be required in order to provide an  
16 informed comparison to the proposed pipe replacement Class 3 estimate and project impacts.

17

18

19

20 33.2 Please confirm that each of the two transmission pipelines that supply the Fraser  
21 Gate station can withstand a 1:2475 seismic event, or explain otherwise and  
22 state the severity of seismic event that it can withstand.

23

24 **Response:**

25 Confirmed. The two transmission pipelines that supply the Fraser Gate station can withstand a  
26 1:2475 seismic event.

27

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**34.0 Reference: Route Selection Process**

**Exhibit B-1, Section 4.3.4, Table 4.4, pp. 117–128**

**Alternative of Only Replacing Pipeline South of Railway Tracks**

The utility states on pages 119 and 128 the new pipeline will follow Route Option 1, which parallels the existing pipeline in East Kent Avenue South and carries on west to Elliott Street, including a short section within Gladstone Park.

34.1 Please develop an assessment similar to that in Section 4.3.4 for an alternative of replacing only the section of the NPS 30 pipeline from Fraser Gate station to where the NPS 30 IP pipeline turns north (i.e. in the vicinity of Test Hole AH95-2), and expand Table 4-4 to include the results for this alternative.

**Response:**

Assuming that this alternative would meet the Project objectives and requirements, the scope would involve the replacement of the existing Fraser Gate IP pipeline from Fraser Gate station to a point in the vicinity at which the existing pipeline turns north, with new pipe. Therefore, this alternative would effectively reduce the Fraser IP Project scope and the potential benefits from this alternative would include:

- Reduction in overall scope in terms of pipeline replacement length requiring less materials and construction effort;
- No construction impact to Gladstone Park; and
- No trenchless crossing required to install the replacement underneath the existing rail lines.

This alternative would introduce a shorter route option, which would be a shorter version of Route Option 1 on East Kent Avenue South which FEI evaluated in the CPCN Application, Exhibit B-1, Section 4.3.4. The potential impact in terms of route evaluation of the shorter route option includes:

1. Health and Safety: the shorter route, with no requirement for a trenchless crossing under the existing rail lines to Elliott Street, would reduce the risk to residents, members of the general public, road users, cyclists and construction personnel. The pipeline construction would result in a relatively isolated construction zone which would help mitigate potential health and safety risk to the general public during construction.
2. Socio-Economic: the shorter route would still impact local traffic movement and one commercial access, however access would remain open to properties on East Kent Avenue North.

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3. Land Ownership and Use: the shorter route would only impact municipal roadway.
4. Ecology: the shorter route would not impact Gladstone Park thereby reducing the overall potential negative environmental impact; however, the construction would still occur in proximity to the Fraser River bank with risk of potential impact from spills and contaminated water runoff.
5. Cultural Heritage: the shorter route would also have negligible impact to archaeology or culturally significant sites.
6. Human Environment: the shorter route would have a lesser impact on human environment than Route Option 1 as this option does not involve construction in Gladstone Park. There would be some impacts to homes and businesses due to road closures, but these would be to a lesser extent.
7. Engineering: the shorter route would avoid the requirement for a trenchless crossing beneath the existing rail lines thereby reducing the overall engineering scope and effort.
8. Construction: the shorter route, with no trenchless crossing, and located in municipal roadway with a prepared surface, sufficient construction access, low utility density and no traffic would facilitate improved productivity, reduced timeline and smallest overall construction footprint.
9. Operation: the shorter route, without the need for a trenchless crossing, would install the pipeline at minimum depth within road allowance facilitating ease of operation and maintenance.
10. System Interface: the shorter route would also involve potentially complex tie-in procedures.
11. Adjacent Utilities: the shorter route would be located in East Kent Avenue South and avoid crossing the rail lines and impact to Elliot Street; therefore, potential impact to adjacent utilities will be minimized.
12. Natural Hazards: the shorter route, similar to the preferred route, will meet FEIs seismic requirements but would be located within the seismic ground displacement zone.

Table 1 below presents the weighted score for each criteria and the overall total score of 410. This compares to a total score of 335 for the Fraser Gate IP Project Preferred Route. As a result, the preferred route option for an alternative of replacing only the section of the NPS 30 pipeline from Fraser Gate station to where the NPS 30 IP pipeline turns north would be along East Kent Avenue South. The magnitude of the benefit in terms route impact reduction is



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1 evidenced by the margin between the total score of the Preferred Route and the shorter route  
2 option variation.

3 **Table 1**

Impact and Vulnerability Consideration	Weight	Score	Weighted Score
<b>Community and Stakeholder</b>			
Health and Safety	15	5	75
Socio-Economic	15	4	60
Land Ownership and Use	5	4	20
<b>Environment</b>			
Ecology	5	3	15
Cultural Heritage	5	5	25
Human Environment	15	3	45
<b>Engineering/Technical</b>			
Pipeline Engineering/Design	5	5	25
Pipeline Construction	10	5	50
Pipeline Operation	5	5	25
System Interface	5	3	15
Adjacent Utilities	5	5	25
Natural Hazards	10	3	30
<b>Totals</b>	<b>100</b>		<b>410</b>

4  
5 Please also refer to the response to BCUC IR 1.31.4.

6  
7  
8  
9 34.1.1 Please clarify whether this alternative would involve Gladstone Park.

10  
11 **Response:**

12 This route option would not involve Gladstone Park.

13 Please also refer to the response to BCUC IR 1.34.1.

14  
15

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34.1.2 Please discuss whether this alternative would involve any trenchless installation.

**Response:**

This route option would not involve any trenchless installation.

Please also refer to the response to BCUC IR 1.34.1.

34.1.3 Please provide a cost estimate for this alternative.

**Response:**

To develop an accurate cost estimate it would first be necessary to define the project scope through further site investigations and detailed engineering outlined in the response to BCUC IR 1.31.2. Assuming that the pipeline replacement length for this alternative would extend from Fraser Gate station to the point at which the existing pipeline turns north (approximately 300m), then an indicative cost for this alternative can be prorated from the AACE Class 3 estimate for the Fraser Gate IP pipeline Project. Based on this approach the approximate cost estimate is \$8.5M (2014 dollars), including contingency but excluding escalation and AFUDC.

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**35.0 Reference: Pipe Specification**

**Exhibit B-1, Section 4.3.3.3.2, p. 114; Exhibit B-1-1, Appendix A-4**

**Adequacy of Replacement Pipeline to Withstand 1:2475 Event**

The utility at page 114 states that the selected wall thickness for the replacement pipe will be 11.1 mm and that the steel grade will be Grade 483.

35.1 Please confirm that a pipeline with the selected wall thickness and steel grade is capable of withstanding the 1.6 metre lateral displacement expected in a 1:2475 return period event.

**Response:**

Based on preliminary design, the proposed pipeline with the selected wall thickness and grade is capable of withstanding a 1.6 metre lateral displacement.

35.1.1 Based on the methodology set out in Exhibit B-1-1, Appendix A-4, what horizontal displacement will the proposed replacement pipe be capable of withstanding?

**Response:**

Preliminary design has estimated that the replacement pipe will be capable of meeting FEI's performance requirements for lateral spread displacements of at least 3 metres.

35.2 Please discuss whether FEI will establish certain other specifications such as notch toughness or fracture toughness for the replacement pipe, to ensure that it will be able to withstand the deformation caused by 1.6 metres of lateral displacement.

**Response:**

The Fraser Gate IP replacement pipe will be designed, manufactured and tested according to the applicable industry standards presented in FEI Application Exhibit B-1 Table 3-4, namely:

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- 1       • CSA Z662-11: Oil and Gas Pipeline Systems
- 2       • CSA Z245.1-07: Steel Pipe
- 3       • FEI internal specifications

4

5 During the Project detailed design stage FEI will develop the precise pipe specification through

6 further engineering and stress analysis. The final specification will define requirements for such

7 aspects as pipe metallurgy, dimensions and tolerances, surface finish and coating, testing

8 requirements (proven pipe body notch-toughness properties, etc.) and quality control

9 documentation including material test reports and certification to confirm the pipe meets the

10 specification and will therefore perform as designed.

11 Pipe installation and construction specifications will also be established during detailed design.

12 These are expected to be requirements for 100% ultrasonic or radiographic inspection of girth

13 welds, definition of a maximum tolerable girth weld flaw size, and the degree to which the

14 minimum girth weld strength should exceed the actual pipe strength.

15

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**I. PIPELINE ROUTING – FRASER GATE**

**36.0 Reference: Fraser Gate – Route Selection Process**

**Exhibit B-1, Section 4.3, pp. 117–118**

**Routing Process within Project Phases**

On pages 117 and 118 of the Application FEI explains its pipeline routing process for the Fraser Gate pipeline project.

36.1 Is FEI seeking CPCN approval to construct and operate the Fraser Gate pipeline in a pipeline corridor, along any of the options identified in the Application, or along the preferred route option?

**Response:**

FEI is seeking CPCN approval to construct and operate the entire Fraser Gate IP Project based on a routing that the Commission determines is in the public interest. Based on the information available to FEI at the time of the Application, FEI has proposed a preferred route (Route Option 1) that meets this requirement. While FEI does not consider it likely, should another route emerge as a more suitable route alignment based on the Company's evaluation of information available subsequent to the filing of the Application, such information will be provided to the Commission to support any proposed change.

36.1.1 If FEI is seeking approval for any of the pipeline route options identified in the Application or any pipeline within the corridor, what conditions should the Commission place on the route selection for the pipeline and why?

**Response:**

Please refer to the response to BCUC IR 1.36.1.

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36.2 If the Commission approved one of the route options and then FEI determined that route option was no longer viable, what process would FEI propose to follow to select the next best alternative route?

**Response:**

If an approved pipeline route is no longer considered feasible during the detailed engineering stage and another route emerges as a feasible alternative subsequent to the CPCN approval (i.e. after the close of the current regulatory proceeding), FEI believes that a limited review by the Commission of the newly proposed route and changes (if any) resulting from the reroute may be conducted based on the evidence provided by the Company. The overall need for the Project, along with many other aspects of the Project, would already have been accepted by the Commission as being in the public interest. If the situation described above does occur, the Company will propose a regulatory review process that will provide an efficient and effective review of the proposed change.

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**37.0 Reference: Fraser Gate – Preferred Route Options Selection**

**Exhibit B-1, Figure 4-3, pp. 120, 125**

**Alternate Route**

In Figure 4-3 on page 120 of the Application FEI provides a map of the Fraser Gate route options.

FEI on page 125 of the Application explains:

Route Option 1 would be located within the seismic ground displacement zone and would meet FEI's seismic criteria of maintaining pressure integrity during a 1:2475 seismic event. Route Options 2 and 3 would be located outside of the ground displacement zone for the majority of the pipeline route. A small portion of both pipeline route options would be within the ground displacement zone at the exit of Fraser Gate station, and both route options would meet FEI's seismic criteria at this location.<sup>26</sup>

37.1 Please identify on Figure 4-3 exactly where the existing pipeline does not meet FEI's seismic criteria (i.e. is within the ground displacement zone).

**Response:**

This response addresses BCUC IRs 1.37.1 and 1.37.2.

The portion of the existing pipeline that does not meet FEI's seismic criteria is shown as Segment A on the revised Figure 4-3 provided in Attachment 37.1. The portion of the proposed Route Option 1 pipeline that is considered within the ground displacement zone is shown as Segment B on the same figure. As noted in the response to BCUC IR 1.31.4, the optimization of the extent of the pipeline that needs to be replaced will be based on further test holes to determine where the soil conditions change from the conditions at Fraser Gate station to those at Test Hole AH95-2.

37.2 Please identify on Figure 4-3 where each of the alternative pipelines requires additional seismic reinforcement (i.e. are within the ground displacement zone).

---

<sup>26</sup> Exhibit B-1, p. 125.

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1 **Response:**

2 Please refer to the response to BCUC IR 1.37.1.

3  
4

5

6 37.3 What is the approximate incremental cost to procure and install a seismically  
7 reinforced pipeline, such as the one proposed by FEI, versus installing a  
8 traditional pipeline in \$/m?

9

10 **Response:**

11 There could be a potential cost difference between the higher grade pipe selected for the NPS  
12 30 Fraser Gate IP pipeline (grade 483 steel) and the grade 359 pipe which would otherwise  
13 have been selected (i.e. similar to the NPS 30 Coquitlam Gate IP) for a non-seismically  
14 vulnerable location. In reality, however, given the relatively short length of the Fraser Gate IP  
15 pipeline, and because the pipe diameter and wall thickness would remain unchanged, there  
16 would likely be no construction and installation cost impact; therefore, FEI does not consider the  
17 incremental cost difference between these options to be material.

18  
19

20

21 37.4 Please explain why an alternative route option that goes straight north from  
22 Fraser Gate (i.e. through what appears to be an empty lot) to Marine Way was  
23 not evaluated in the Application.

24

25 **Response:**

26 An alternative traversing north from Fraser Gate through the undeveloped lot to South East  
27 Marine Drive was considered during the initial route option screening process. The vacant,  
28 developable property is zoned CD-1, with values approaching \$7 million per acre, and is  
29 adjacent to newer multi-family residential developments. The pipeline right of way would have  
30 impacted the total buildable area and led to high compensation costs. Consideration was also  
31 given to the compatibility of the pipeline segment with the highest and best use of the site.  
32 Given the availability of other linear-use lands, coupled with the potentially high acquisition  
33 costs, acquiring this lot for pipeline routing was not explored further, and this route option was  
34 therefore not evaluated.



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1     **J.       COST – FRASER GATE**

2     **38.0   Reference:   Fraser Gate – Project Cost Estimate**

3                     **Exhibit B-1-2, Appendix A-22-A-27**

4                     **Preparation Effort and Project Definition**

5             38.1   Please provide the cost of preparing the estimate, the number of hours spent  
6                     preparing the estimate, the preparation effort, and the percent project definition  
7                     complete at the time of the estimate for the preferred route and each alternative  
8                     for the Fraser Gate pipeline.

9  
10    **Response:**

11   The cost estimate preparation effort for the preferred alternative included:

- 12       •   Cost for preparing the estimate: \$109,000 in 2014\$;
- 13       •   The number of hours spent preparing the estimate is approximately 750 hours
- 14           comprising both FEI internal Subject Matter experts and external consultants; and
- 15       •   Specific percent project definition complete at the time of the estimate: 10-40% as stated
- 16           in FEI Application Exhibit B-1, Appendix A24.

17

18   Note the only other project alternative was the “Do nothing” option, which did not require an

19   estimate.

20

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1     **K.       RISKS – FRASER GATE**

2     **39.0    Reference:   Fraser Gate – Cost Risk Analysis**

3                     **Exhibit B-1**

4                     **Biggest Impacts on the Project Cost and Risks**

5             39.1    Please confirm that the trenchless and trenched costs will have the biggest  
6                     impact on the Fraser Gate project cost and risk and discuss what measures FEI  
7                     is taking to minimize these costs and risks.

8  
9     **Response:**

10    Please refer to the response to BCUC IR 1.23.1. The same methodology, as detailed for the  
11    Coquitlam Gate IP Project, in terms of cost risk analysis, was also completed for the Fraser  
12    Gate IP Project; it can be referenced in Exhibit B-1, Appendix A-27. Trenched and trenchless  
13    costs are also identified as the key risk drivers for the overall Project capital cost, and are  
14    confirmed as having the largest potential impact on the Project cost. As the Project develops  
15    through detailed design and routing, and finally construction, the same risk management  
16    strategies outlined for the Coquitlam Gate IP Project will also apply to the Fraser Gate IP  
17    Project.

18

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**L. ACCOUNTING – FRASER GATE**

**40.0 Reference: Project Costs And Accounting Treatment**

**FEI PBR Decision, p. 182**

**CPCN Savings and O&M savings in PBR**

The Panel recommends that, if capital associated with a particular CPCN is excluded from the formula, the CPCN review of that project should include an assessment by the Commission of any potential impact of the project on O&M. If appropriate, an adjustment to the formula based O&M spending envelope should then be made.<sup>27</sup>

40.1 Please provide all FEI O&M and capital savings resulting from Fraser Gate IP Project by year from 2018 to 2019.

**Response:**

There are no O&M and capital savings that have been identified resulting from the Fraser Gate IP Project.

40.2 Does FEI agree that the formula based O&M spending envelope should be adjusted for savings due to the Fraser Gate IP Project? Please explain why, or why not.

**Response:**

No, the justification for the Fraser Gate IP Project is premised on safety and reliability and, as identified in the response to BCUC IR 1.40.1, O&M savings associated with this Project are not expected. Therefore, there is no basis on which the formula O&M spending could be reduced.

Please also refer to the response to BCUC IR 1.24.1.

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<sup>27</sup> FEI PBR Decision, p. 182.

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**41.0 Reference: Project Costs And Accounting Treatment**

**Exhibit B-1, Section 1.1, p. 1**

**Asset Gains/Losses**

FEI on page 1 of the Application requests to:

... Construct and operate a new NPS 30 IP pipeline operating at 1200kPa between Fraser Gate Station and East Kent Avenue & Elliott Street to upgrade and replace an existing NPS 30 IP pipeline...<sup>28</sup>

41.1 Please provide the gain/loss on the replacement of the existing NPS 30 IP pipeline by asset class, included the original cost of the assets and the accumulated depreciation.

**Response:**

FEI's records do not have an original cost for the existing NPS 30 Fraser Gate IP pipeline. However, Distribution Mains (Plant Account 475) regional cost in Vancouver for the IP Pipe is \$2,468,979 and the accumulated depreciation forecast at December 31, 2018 will be \$1,107,574, leaving a Net Book Value of \$1,361,405.

The following table shows the allocated cost and accumulated depreciation based on the length of IP pipe being retired proportional to the total length of IP pipe being retired.

	IP Pipe Length (m.)	Proportion	Allocated Gross Plant Cost	Allocated Accumulated Depreciation	Allocated Net Book Value
Fraser Gate IP Pipeline Retired	500	0.119	\$ 293,926	\$ (131,854)	\$ 162,072
Other IP Pipe in Vancouver Retired	<u>3,700</u>	0.881	<u>2,175,053</u>	<u>(975,720)</u>	<u>1,199,333</u>
Total	4,200		\$ 2,468,979	\$ (1,107,574)	\$ 1,361,405

In the PBR Decision on page 246, the Commission directed "FEI to discontinue use of the Gains and Losses deferral account, effective January 1, 2014". Consequently, estimated gains or losses will reside in the Accumulated Depreciation account.

<sup>28</sup> Exhibit B-1, p. 1.

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1     **42.0   Reference:   Project Costs and Accounting Treatment**

2                             **Exhibit B-1, Section 4.3.3.6, p. 116**

3                             **Existing ROW**

4             FEI on page 116 of the Application explains:

5                     The majority of this alignment will be located within road allowance, while a small  
6                     portion of the proposed pipeline route may fall within Gladstone Park or  
7                     neighbouring properties either of which will require new land and access rights.<sup>29</sup>

8             42.1   Will parts of the existing NPS 30 Fraser Gate IP pipeline ROW cease to be used  
9                     for utility service, if the proposed NPS 30 Fraser Gate IP pipeline preferred route  
10                    option is constructed? If yes, please provide the value of the ROW that will cease  
11                    to be used.

12  
13     **Response:**

14     The portion of the existing Fraser Gate IP pipeline proposed to be replaced is within road  
15     allowance on East Kent Avenue South and East Kent Avenue North, then Elliot Street, except  
16     where it crosses beneath CPR's Marpole Subdivision for which the Company has a railroad  
17     crossing agreement. As the untitled road allowance is held publicly under the jurisdiction of the  
18     City of Vancouver, there is no formal right of way agreement to be discharged. The pipeline  
19     exists in the road allowances under terms of an operating agreement and no direct fees are  
20     directly attributable. Thus, there will be no monetary value to be released.

21

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<sup>29</sup> Exhibit B-1, p. 116.

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1    **43.0    Reference:    Project Costs and Accounting Treatment**

2                            **Exhibit B-1, Section 9.4, p. 187**

3                            **Rate impact**

4            43.1    Please show the calculation of the Fraser Gate IP Project in Table 9-6. Include  
5                    the requested information in the form of a fully functioning electronic  
6                    spreadsheet.

7  
8    **Response:**

9    The following table summarizes the calculation of the approximate rate impact in 2019 and for  
10 the 60 Year Levelized Average.

		Fraser Gate IP Project	
		PV of Incremental	
		2019	Revenue
Incremental Revenue Requirement		\$ 1,588	\$ 21,654
Annual Volume		187,832	2,973,050
2019 Average Delivery Impact &			
Levelized Average Delivery Impact \$ / GJ		\$ 0.008	\$ 0.007

11  
12  
13    The fully functional electronic spreadsheet that contains the details of the calculations was filed  
14    with the Commission as an attachment to Confidential Appendix E-1-2. In the Excel file the  
15    details summarized in Table 9-6 and in the table above are in the Tab labelled "Levelized Rate  
16    Calculation".

17

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1     **M.     COST – GENERAL**

2     **44.0   Reference:   Project Cost Estimate**

3                     **Exhibit B-1**

4                     **Basis of Estimate**

5             44.1   Please discuss the impacts the recent and forecasted oil price and exchange rate  
6                     fluctuations will have on material and construction costs estimates and please  
7                     update the cost estimates to reflect these impacts.

8  
9     **Response:**

10   As stated in Exhibit B-1, Appendix A-23 (Basis of Estimate document), section 1.4.2, the  
11   estimate was completed to a Q2 2014 pricing basis, and an exchange rate between CAD\$ and  
12   United States dollars (US\$) was set at CAD\$ 1.10 = US\$ 1.00. As stated in Exhibit B-1,  
13   Appendix A-24 (Pipeline Basis of Estimate), section 6.1.1, fuel rates of \$ 1.50/L for gasoline and  
14   \$1.50/L for diesel were used in the estimate.

15   Since this date, the Canadian dollar has declined relative to US and European currencies.  
16   However, the quotes and price source for the estimate were in CAD\$, with quotes received from  
17   BC and Alberta material and equipment suppliers which may limit the influence of exchange rate  
18   fluctuations to impact the cost estimate. Furthermore, recent market price tracking has indicated  
19   that, unless the base material (i.e. steel, copper, etc.) is US sourced, Canadian pricing has  
20   shown to be relatively unaffected by recent exchange rate fluctuations. Recent fluctuations in  
21   retail gasoline prices have seen the price drop to below the cost base used in the estimate but  
22   with a current upward trend. For these reasons, FEI does not consider updating the Projects'  
23   estimates as suggested by the question be warranted at this time.

24   Future unforeseen material or labour escalation beyond normal inflation (whether due to oil  
25   costs, exchange rate variation, or other external market-driven reasons) has not been factored  
26   in the estimate, nor is it appropriate or possible to do so at this time. Following approval of the  
27   Projects, updated cost estimate information would be provided to the Commission if requested  
28   as part of the periodic reporting process. Please also refer to the responses to BCOAPO IRs  
29   1.5.2 and 1.5.5.

30

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1     **N.       RISKS – GENERAL**

2     **45.0   Reference:   Basis of Estimate**

3                     **Exhibit B-1, p. 7; Exhibit B-1-2, Appendix A-23, p. 16; Order in**  
4                     **Council 749**

5                     **Other British Columbia Natural Gas Projects**

6             FEI on page 7 of the Application states:

7                     The two IP pipeline replacement Projects as proposed, in conjunction with other  
8                     planned TP pipeline looping projects (Cape Horn-Coquitlam, Nichol-Port Mann  
9                     and Nichol-Roebuck in Figure 1-3) that have been identified as being required for  
10                    either capacity and/or security of supply purposes and that are expected to be  
11                    constructed as described in section 1.3, will significantly improve the resiliency of  
12                    the natural gas system in the Lower Mainland.<sup>30</sup>

13             In the basis for estimate it explains that the potential impact of other projects occurring  
14             during the same timeframe is not taken into account in the estimate.<sup>31</sup>

15             Order in Council 749 provides further information on these projects and other FEI Lower  
16             Mainland pipeline projects.<sup>32</sup>

17             45.1   Please confirm that these other FEI Lower Mainland pipeline projects are  
18                    expected to be constructed around the same time as the Fraser Gate and  
19                    Coquitlam Gate projects. If not confirmed, please explain.  
20

21     **Response:**

22             The TP pipeline looping projects (Cape Horn-Coquitlam, Nichol-Port Mann and Nichol-Roebuck)  
23             are currently being planned for construction in 2017. As shown in the project schedules in  
24             Appendix A-20-1 and Appendix A-20-2 of the Application, the IP pipeline replacement Projects  
25             are being planned for construction in 2018.

26  
27

28  
29             45.2   Please discuss how the volume and timing of work associated with these other  
30                    FEI Lower Mainland gas pipeline projects will affect the cost and schedule of this

<sup>30</sup> Exhibit B-1, p. 7.

<sup>31</sup> Exhibit B-1-2, Appendix A-23, p. 16.

<sup>32</sup> Order in Council 749.



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project. Please confirm this is one of the biggest risks to these projects and provide the risk treatment plan and action plans.

**Response:**

FEI recognizes that the availability of resources with necessary experience to complete the construction in a safe manner to meet the project schedule and budget is a key consideration when planning large capital projects. The IP Projects are scheduled for construction in 2018. In addition, FEI is planning other system upgrades for 2017 which are scheduled to be completed prior to start of the IP Projects in 2018. Therefore, the IP Projects will not be at risk, in terms of resource constraints, from other FEI projects.

However, there is a risk that other large pipeline projects in BC or western Canada could restrict resource availability in 2018 and suitably experienced project teams might not be available and lesser experienced resources would only be available to construct the Fraser Gate and Coquitlam Gate IP pipelines. This risk has been recognized and recorded in the project risk register (risk 22). Existing controls include procurement planning, early contacting of contractors to inform the contracting market of these upcoming projects and early request for Expressions of Interest. The risk treatment plan includes early commitments from contractors, periodic labour market reviews and project contingency.

45.3 Please justify the appropriateness of not taking into account the potential impact of other these projects occurring during the same timeframe as this project.

**Response:**

Please refer to the response to BCUC IR 1.45.2.

45.4 Please discuss the risks to this project and its goals of resiliency and flexibility if any of other FEI Lower Mainland gas pipeline projects are not constructed.

**Response:**

Of the three identified TP pipeline looping projects, the Cape Horn-Coquitlam project is the only one that would have an impact on achieving the Projects' goals of resiliency and flexibility, and

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the impact is limited to circumstances where the load from Fraser Gate would need to be shifted to Coquitlam Gate, such as the loss of Fraser Gate or an upstream pipeline (Nichol-Roebuck). As quantified in the responses to BCUC IRs 1.8.1 and 1.8.2.1, in the absence of the Cape Horn-Coquitlam loop and under peak hour design conditions, customer outages could still occur, but to a lesser extent. The presence of the NPS 30 Coquitlam Gate IP pipeline operating at 2070 kPa allows more operating flexibility to manage an isolated scenario to prevent a more widespread uncontrolled loss of pressure in the Metro IP System limiting the extent of customer outages.

In the case of a requirement to shift load from Coquitlam Gate to Fraser Gate, such as a failure of Coquitlam Gate or upstream pipelines (Nichol-Port Mann or Cape Horn-Coquitlam), the existing Coastal Transmission System would have the capacity to support such a load shift at the end of the 20-year planning period without requirement for any of the identified TP loops. So the absence of the three identified TP loops would not impact resiliency and flexibility to respond to this scenario.

Resiliency and flexibility in the Metro IP system improves significantly with the proposed NPS 30 Coquitlam Gate IP pipeline with or without the three identified TP loops.

45.5 Please discuss the risks to any of these other FEI Lower Mainland gas pipeline projects if this project is not constructed.

**Response:**

FEI believes that there is no risk to the other FEI Lower Mainland gas pipeline projects, which are transmission system looping projects, since they are upstream of the Coquitlam Gate IP and Fraser Gate IP Projects.

Please also refer to the response to BCUC IR 1.45.4.

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1     **O.       ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS – GENERAL**

2     **46.0   Reference:   Environmental Assessment**

3                     **Exhibit B-1, Section 6.1, p. 141; Exhibit B-1-1, Appendix B-1**

4                     **Environmental Assessment**

5             The utility states on page 141 “The assessment is based on both a desktop review of  
6             available information and initial field investigations.”<sup>33</sup>

7             46.1   Please confirm, otherwise explain, that the Environmental Assessment considers  
8             all routing options considered, for both Coquitlam Gate and Fraser Gate projects  
9             or if it the assessment is based only on the preferred routing option.

10

11     **Response:**

12     The Environmental Assessment covered a wide assessment area but focused on a 200 metre  
13     wide study corridor along the existing Coquitlam Gate IP and Fraser Gate IP alignments  
14     (applied as 100 metres on either side of the existing alignment). Both alignments, due to  
15     fundamental routing constraints detailed in FEI Application Exhibit B-1, section 3.3.4.3, formed  
16     the basis for the route selection assessment corridor in which feasible route options were  
17     identified and analyzed. All of the preferred route options and the majority of the considered  
18     route options were found within, or in close proximity to, the 200 metre wide environmental  
19     assessment corridor. Therefore, based on the extent of the assessment area and high level  
20     information reviewed, the relative proximity of each route option to the study corridor, and the  
21     general similarity of the urban terrain along the route corridor, the Environmental Assessment  
22     considered sufficient information to identify potential environmental risks and facilitate the  
23     routing analysis for route options both within the study corridor, and for localized instances  
24     where a route option fell outside the study corridor.

25

---

<sup>33</sup> Exhibit B-1, p. 141.

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**47.0 Reference: Socio-Economic Assessment**

**Exhibit B-1, Section 6.3.1, p. 147**

**Potential Economic Benefits**

Table 6-1 on p. 147 of the Application, FEI estimates the economic benefits of the two upgrades to be \$201 million for the Coquitlam Gate IP project and \$15 million for the Fraser Gate IP project.

47.1 Please explain the methodology, assumptions and calculations used to estimate the economic benefit values.

**Response:**

The estimated economic benefits are based on the estimated capital expenditures in 2014 dollars that are associated with the planning, design and construction of the projects. Please refer to Appendix B-3 for the Socio-Economic Overview Assessment.

The calculations of the Projects' economic benefits for various geographic sectors are based on the following assumptions:

- The total costs are based on the Class 3 cost estimates contained in Confidential Appendix E-3-1 and E-3-2;
- For purposes of determining the economic benefits by cost category, the percent contingency has been applied to each of the three cost categories and the PST has been applied to the materials category;
- The construction category is the summation of the EPCM and construction categories of costs identified in Confidential Appendix E and the owner category reflects the total cost of the Projects less the materials and construction costs;
- Materials cost is split 5% for all BC and 95% external to Canada. The 5% is the cost associated with freight/taxes etc. when the materials enter Canada;
- Construction cost is split 70% for the Lower Mainland and 30% for the rest of Canada. The 70% for the Lower Mainland is direct labour cost for local project works and the 30% for the rest of Canada is the cost of equipment rentals and direct costs for contractors from Alberta; and,
- Owners cost is a direct cost of the Project and is expected to be expended 100% in the Lower Mainland.

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1  
2                   47.1.1   Please provide functional excel spreadsheets of the calculations, if  
3                   available.

4  
5   **Response:**

6   Please refer to Confidential Attachment 47.1.1 containing the functional excel spreadsheets.  
7   Attachment 47.1.1 is being filed confidentially as it contains capital cost estimates for the Project  
8   that must be kept confidential in order to preserve FEI's ability to negotiate with bidding parties.

9   Please also refer to the response to BCUC IR 1.47.1.

10

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**48.0 Reference: Overview of Environmental, Archaeological and Socio-economic  
Assessments and Provincial Government Energy Objectives  
Exhibit B-1, Section 6.4, p. 148  
Provincial Government Energy Objectives**

Section 46(3.3)(a) of the *Utilities Commission Act* states that in deciding whether to issue a CPCN, the commission must consider and be guided by BC energy objectives.

On page 148 FEI states:

Based on the results of the socio-economic report (Appendix B-3), FEI expects that the Projects will support the following British Columbia energy objective found in Section 2(k) of the *Clean Energy Act*.<sup>34</sup>

48.1 For each of the British Columbia energy objectives listed under sections 2(a) to 2(p) of the *Clean Energy Act*, please identify whether it is applicable to the Projects. If not applicable, please explain why not.

**Response:**

The Projects provide for the continued reliable supply of natural gas energy to customers in British Columbia through infrastructure replacement. As such, FEI believes that the only directly related British Columbia energy objective is that listed under Section 2(k) of the *Clean Energy Act* for the reasons listed in the Application. The objectives listed under Sections 2(a), (c), (e), (f), (n) and (p) relate primarily to electricity and BC Hydro, and for that reason are not directly applicable to the Projects. As the Projects call for the replacement of existing infrastructure with similar infrastructure, the objectives listed under Sections 2(b), (d), (g), (h), (i), (j), (l), (m) and (o) are not directly applicable to the Projects.

48.1.1 Please explain whether the Projects are favourable, neutral or unfavourable to the applicable energy objectives identified above.

**Response:**

Other than British Columbia energy objective found in Section 2(k):

*to encourage economic development and the creation and retention of jobs*

---

<sup>34</sup> Exhibit B-1, p. 148.

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- 1 where FEI believes the Projects have a favourable effect, FEI believes the Projects to have a
- 2 neutral effect on other energy objectives for the reasons set out in the response to BCUC IR
- 3 1.48.1.
- 4

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1 **P. ACCOUNTING – GENERAL**

2 **49.0 Reference: Coquitlam Gate IP**

3 **Exhibit B-1, Section 3.4.1.4.2, p. 100; Statistics Canada, 2371 - utility**  
 4 **system construction;<sup>35</sup> FEI Annual Review for 2015 Rates (2015 FEI**  
 5 **Annual Review), p. 13**

6 **Escalation Rate**

7 FEI states:

8 An escalation rate of 4.5 percent per annum is used based on the ten year  
 9 average escalation rates from Statistics Canada for industrial construction and  
 10 line pipe from 2002 to 2012.<sup>36</sup>

11 FEI also states that the CPI/AWE Inflation for 2015 is 1.303 percent.<sup>37</sup>

12 49.1 Please provide the source of the 2002 to 2012 escalation rates and the 2009–  
 13 2014 escalation rates from Statistics Canada for industrial construction and line  
 14 pipe.

15 **Response:**

16 **Statistics Canada Website for CANSIM:**

- 17 • Table 327-0043 Price Indexes of non-residential building construction;
- 18 • Table 329-0063 Industry price indexes for primary metal products and fabricated metal
- 19 products – Line pipe, transport of natural gas and oil (terminated in 2013); and,
- 20 • Table 329-0075 Industry Production Price Index, NAPCS 31214 Iron and Steel Pipes
- 21 and Tubes (except castings). Please note that Table 329-0075 replaces Table 329-
- 22 0063.
- 23

24 <http://www5.statcan.gc.ca/cansim/a26>

25 The following tables have been copied or replicated from the various Tables on the Statistics  
 26 Canada Cansim site:

<sup>35</sup> Statistics Canada, “North American Industry Classification System (NAICS) Canada 2012”  
<http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=118464&CVD=118467&CPV=2371&CST=01012012&CLV=3&MLV=5>.

<sup>36</sup> Exhibit B-1, p. 100.

<sup>37</sup> 2015 FEI Annual Review, p. 13.



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1

### Non-Residential Building Construction: CANSIM Table: 327-0043

YEAR	1	2	3	4	Average	Year to Year Escalation	5 Year Average Escalation	10 Year Average Escalation
2002	99.2	99.6	100.0	101.2	100.0			
2003	102.1	103.0	103.5	103.9	103.1	3.13%		
2004	106.7	109.7	113.0	114.8	111.1	7.68%		
2005	115.1	117.0	119.2	120.8	118.0	6.28%		
2006	122.7	126.1	128.8	131.5	127.3	7.84%		
2007	134.2	138.3	139.8	141.2	138.4	8.72%	6.71%	
2008	145.1	155.9	160.0	155.8	154.2	11.44%	8.38%	
2009	150.3	146.8	145.1	144.5	146.7	-4.88%	5.72%	
2010	144.3	146.5	146.8	147.2	146.2	-0.32%	4.37%	
2011	150.0	151.5	153.1	154.1	152.2	4.09%	3.64%	
2012	155.5	156.3	156.8	157.6	156.6	2.87%	2.50%	4.58%
2013	157.9	158.4	158.8	159.0	158.5	1.26%	0.55%	4.39%
2014	160.0	160.8	161.0	161.4	160.8	1.44%	1.86%	3.77%

2

3

4

### Line pipe, transport of natural gas and oil (Terminated in 2013): CANSIM Table: 329-0063

Year	January	February	March	April	May	June	July	August	September	October	November	December	Average	Year to Year Escalation	5 Year Average Escalation	10 Year Average Escalation
2002	102.3	101.0	98.9	100.0	98.7	100.9	100.6	98.3	102.6	100.0	98.4	98.1	100.0			
2003	96.5	99.2	99.3	98.8	98.3	100.2	99.0	98.8	99.1	99.9	99.0	97.2	98.8	-1.21%		
2004	99.2	99.7	101.0	103.1	113.8	118.8	121.3	129.4	137.7	140.2	142.7	138.7	120.5	21.96%		
2005	148.3	152.9	145.1	139.1	143.7	141.2	136.5	130.6	132.2	136.0	135.5	136.4	139.8	16.04%		
2006	139.3	143.4	138.9	138.4	140.5	141.2	140.7	139.7	140.0	141.7	141.9	140.6	140.5	0.52%		
2007	140.3	140.2	136.7	137.1	136.7	133.3	135.5	137.2	137.2	137.6	137.1	137.2	137.2	-2.38%	6.53%	
2008	137.2	136.5	136.3	136.2	136.6	137.6	138.6	139.1	139.5	139.6	140.1	140.2	138.1	0.69%	6.94%	
2009	140.4	139.9	140.0	139.8	139.8	139.9	139.4	140.1	139.0	139.3	138.1	138.2	139.5	0.99%	2.98%	
2010	139.3	145.8	145.2	143.7	148.3	147.6	148.1	148.1	148.2	148.2	147.9	148.1	146.5	5.05%	0.95%	
2011	148.5	148.7	148.9	149.5	149.8	152.7	152.4	152.2	153.0	154.1	155.5	156.6	151.8	3.61%	1.56%	
2012	154.5	155.3	155.4	154.5	152.7	154.5	154.6	153.4	153.6	152.0	155.8	151.9	152.9	0.69%	2.19%	4.34%
2013	148.5	145.3	147.2	147.3	145.4	146.7	147.0	146.5	147.1	147.1			146.7	-4.04%	1.21%	4.04%

5

6

7

8

### Iron and Steel Pipes and Tubes (except castings): CANSIM Table: 329-0075 (replaces terminated CANSIM Table 329-0063)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Average	Year to Year Escalation	4 Year Average
2010	95.1	98.6	100.4	99.7	101.3	101.4	101.4	100.4	100.4	100.2	100.1	100.9	100.0		
2011	101.9	103.3	103.2	103.4	103.0	104.0	103.7	102.8	103.1	103.5	104.0	104.3	103.4	3.36%	
2012	103.6	103.7	103.8	103.7	103.0	103.5	103.5	102.8	102.8	102.3	103.6	102.5	103.2	-0.11%	
2013	100.2	92.9	97.0	97.5	93.3	96.8	97.2	95.8	97.3	96.6	94.4	95.4	96.2	-6.81%	
2014	100.1	98.5	98.6	100.3	99.4	98.7	101.9	99.3	97.9	98.6	99.8	98.6	99.3	3.23%	-0.17%

9

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1 The five year and ten year average escalation of both non-residential building construction  
2 (Cansim Table: 327-0043) and Line Pipe (Cansim Table: 329-0063, terminated in 2013) are the  
3 following:

10 Year Average Escalation 2002 - 2012	4.46%
10 Year Average Escalation 2003 - 2013	4.21%
2007 5 Year Average	6.62%
2008 5 Year Average	7.66%
2009 5 Year Average	4.35%
2010 5 Year Average	2.66%
2011 5 Year Average	2.60%
2012 5 Year Average	2.34%
2013 5 Year Average	0.88%

4  
5 The five year average escalations in the first 2 tables above are calculated by the following  
6 formula:

7  $\sqrt[5]{(\text{Yr } 5 / \text{Yr } 0)} - 1$  and the ten year average is the following formula  $\sqrt[10]{(\text{Yr } 5 / \text{Yr } 0)} - 1$ .

8  
9

10

11 49.2 Please provide the 2009–2014 escalation rates by year and five-year average  
12 escalation rate for 2009-2014 from Statistics Canada for utility system  
13 construction.

14

15 **Response:**

16 The industry code for utility construction index is 23712 for oil and gas pipeline and related  
17 structures in Statistics Canada Cansim. This code is not included in the Cansim Tables for  
18 Prices and Price Indexes. In a reply from Statistics Canada FEI was directed to use Cansim  
19 Table: 329-0075 and Iron and steel pipes (except castings) code IPPI 312141. The first year of  
20 the index values are 2010, therefore a 5 year average is not available. However, in FEI's  
21 response to BCUC IR 1.49.1 index values for 2010 through 2014 are shown as well the year to  
22 year escalation and a 4 year average of negative 0.17%.

23

24

25

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49.3 Please explain why the Statistics Canada 10 year average escalation rate for industrial construction and line pipe is more appropriate for the LMIPSU CPCN than the utility system construction escalation rates, or the CPI/AWE Inflation of rate of 1.303 percent for 2015 in the 2015 FEI Annual Review.

**Response:**

FEI believes that it is more appropriate to use an escalation rate that includes pipeline and non-residential building construction indexes because the use of either utility construction escalation rates or the CPI/AWE inflation index would not be indicative of expected price level changes for the type of specific specialized work that is being undertaken for these CPCN Projects.

This is primarily because the Projects are not strictly related to pipeline construction. For example, the Coquitlam Gate IP Project entails the construction of a new Coquitlam Gate station, Intermediate Stations, and a new station being constructed at 2<sup>nd</sup> & Woodland and involves construction of structures and equipment that are specialized as well as the new replacement pipeline.

More specifically, with regard to utility construction escalation rates, as stated in the response to BCUC IR 1.49.2 there is no price index for utility system construction for oil and gas pipeline. The CANSIM table that FEI was instructed to use by Statistics Canada is table 329-0075 Industrial Production Price Index (IPPI) 312141. Further, the CPI/AWE inflation index is indicative of price level change for a very broad range of products and services.

Further, FEI has chosen to use a ten year average to smooth out large variations in the yearly average index price. As can be seen from the tables in FEI's response to BCUC IR 1.49.1 the yearly average index price level changes are erratic from positive to negative and the amount of the change in the year to year escalation / de-escalation.

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**50.0 Reference: Project Costs and Accounting Treatment**

**Exhibit B-1, Section 3.2.3.2, p. 44**

**LMIPSU Application Cost**

FEI states that its after tax weighted average cost of capital is 6.14 percent.<sup>38</sup>

50.1 Has FEI's after tax weighted average cost of capital (WACC) changed since the filing of the Application? If yes, please provide and show the calculation of FEI's most current WACC.

**Response:**

No, FEI's approved after tax WACC has not changed since the filing of this Application. However, FEI has filed its 2015 Annual Review under its Multi Year PBR. The following table calculates the after tax Weighted Average Cost of Capital based on this filing. It is important to note that the 2015 Annual Review is still an ongoing matter before the Commission and the Commission has not made any determinations regarding the Company's Capital Structure and Cost of Capital.

FEI ANNUAL REVIEW for 2015, EVIDENTIARY UPDATE JANUARY 29, 2015

	Section 11, Schedule 38, 2015 Revised Rates Average		Section 11, Schedule 14		
	Capital Structure	Embedded Cost	Cost Component	1 - Tax Rate	After Tax WACC
Long-Term Debt	52.64%	6.61%	3.48%	74%	2.57%
Unfunded Debt	8.86%	1.75%	0.16%	74%	0.11%
Common Equity	<u>38.50%</u>	8.75%	<u>3.37%</u>		<u>3.37%</u>
Total	100.00%		7.00%		6.06%

The after tax WACC used in the financial models is 6.14% which is very close to the 6.06% calculated from the evidentiary update to the 2015 Annual Review and as such, does not have a material impact.

<sup>38</sup> Exhibit B-1, p. 44.

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**51.0 Reference: Project Costs and Accounting Treatment**

**Exhibit B-1, Section 5.2.2, p. 139**

**LMIPSU Application Cost**

FEI states:

FEI proposes a three year amortization period starting in 2016. The December 31, 2015 net-of-tax balance in the LMIPSU Application Costs deferral account is forecast to be \$1.047 million as set out in the following Table 5-3.<sup>39</sup>

51.1 Please provide a breakdown of the \$1.307 million of LMIPSU Application Costs by cost centre and year.

**Response:**

The following table provides a breakdown of the forecast LMIPSU Application Costs by category of cost and by year. FEI does not track application costs by cost centre; however, consultant costs and contractor fees are largely attributable to the Project Management Office, Engineering Services and Regulatory Services departments. Please note that only the actual costs will be charged to the deferral account for recovery from customers.

**Forecast Application Costs, \$ Thousands**

Line	Cost Component	Year		
		2014	2015	Total
1	Consultant & Contractor Fees <sup>1</sup>	\$ 300	\$ 171	\$ 471
2	Legal Fees	28	165	193
3	Commission Costs	-	275	275
4	PACA Reimbursements	-	319	319
5	Other	50	-	50
6	<b>Total</b>	<b>\$ 377</b>	<b>\$ 930</b>	<b>\$ 1,307</b>

<sup>1</sup> Includes Engineering and Project Management Office

51.1.1 For each cost centre in the previous question provide a schedule showing the breakdown of each cost centre's total expenditures by O&M and direct charges to capital projects by year for 2010–2014.

<sup>39</sup> Exhibit B-1, p. 139.

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**Response:**

The following table provides the labour costs charged to capital projects and the total operating and maintenance expense from the Project Management Office (PMO) and Engineering Services departments referred to in the response to BCUC IR 1.51.1 for the years 2010-2014. Please note that the 2014 information reflects preliminary actual information as the 2014 actual information will not be finalized until the end of April.

Aside from the Project Management Office and Engineering Services, other departments are not charging internal labour costs. Any project related charges managed by the other departments are for third party services that are not part of their departmental operating and maintenance expense.

	Actual 2010	Actual 2011	Actual 2012	Actual 2013	Preliminary Actual 2014
<b>Labour Charges to Capital Projects (\$000s)</b>					
Engineering and PMO	2,227	4,158	4,130	4,306	5,213
<b>O&amp;M Expenditures (\$000s)</b>					
Engineering and PMO	1,473	1,994	1,425	2,003	2,269

51.2 Please provide the rate impact of amortizing the LMIPSU Application Costs deferral account over one year and two years. Show the calculation and include the requested information in the form of a fully functioning electronic spreadsheet.

**Response:**

The following table summarizes the rate impact of amortizing the LMIPSU Application Costs over one year and over two years.

The rate impact of amortizing the costs over one year is approximately \$0.008 per GJ and the rate impact of amortizing the costs over two years is \$0.004 per GJ.



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	1 Year Amort'n 2016	2 Year Amortization 2016      2017	
Amortization Expense	\$ 1,047	\$ 524	\$ 524
Income Tax	374	193	187
Earned Return	<u>37</u>	<u>56</u>	<u>19</u>
Total Revenue Requirement	<u>\$ 1,458</u>	<u>\$ 773</u>	<u>\$ 729</u>
Non-Bypass Sales / T-Service Volume TJ	187,832	187,832	187,832
<b>Average Rate Impact \$ / GJ</b>	<b>\$ 0.008</b>	<b>\$ 0.004</b>	<b>\$ 0.004</b>

A fully functional electronic spreadsheet is included as Attachment 51.2 and the calculations are in the tab labelled "BCUC 1.51.2".

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1    **52.0    Reference:    Project Costs and Accounting Treatment**

2                                **Exhibit B-1, Section 5.2.2, pp. 139–140**

3                                **LMIPSU Development Cost**

4                    FEI states on page 139 of the Application:

5                                FEI is seeking Commission approval for a deferral account, the LMIPSU  
6                                Development Costs account, attracting the weighted average cost of capital until  
7                                it enters rate base on January 1, 2016. In consideration of the amortization  
8                                period of similar deferral accounts in FEI and the forecast rate impact of this  
9                                proposed account, FEI proposes a three year amortization period...<sup>40</sup>

10                    52.1    Please provide a breakdown of the \$2.224 million of LMIPSU Development Costs  
11                                by cost centre and year.

12

13    **Response:**

14    FEI notes the total Project Development costs on Table 5-4 in the Application is \$2.442 million,  
15    not \$2.224 million as stated in this Information Request.

16    FEI does not track development costs by cost centre; however, FEI has provided a breakdown  
17    by year of the LMIPSU Project Development Costs by cost category and year. In addition, FEI  
18    has further broken down the costs between external consultant/contractor costs and internal  
19    costs. As shown in the table below, the majority of the internal costs are from the Project  
20    Management Office and Engineering Services departments. Please note that only the actual  
21    costs will be charged to the deferral account for recovery from customers.

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<sup>40</sup> Exhibit B-1, p. 139.



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### Forecast Development Costs, \$ Thousands

Line	Cost Component	Year			Total
		2013	2014	2015	
1	<i>Consultant &amp; Contractor Fees</i>				
2	Engineering	\$ 63	\$ 1,442	\$ -	\$ 1,505
3	Environmental & Archaeological	77	111	-	188
4	Stakeholder Engagement	-	76	-	76
5	Property Services	4	94	50	148
6		<b>144</b>	<b>1,723</b>	<b>50</b>	<b>1,916</b>
7	<i>FortisBC Internal</i>				
8	Project Management	44	95	44	182
9	Engineering	66	132	66	263
10	Stakeholder Engagement	-	78	3	81
11		<b>109</b>	<b>305</b>	<b>113</b>	<b>527</b>
12					
13	<b>Total</b>	<b>\$ 253</b>	<b>\$ 2,028</b>	<b>\$ 162</b>	<b>\$ 2,443</b>

52.1.1 For each cost centre in the previous question provide a schedule showing the breakdown of each cost centre's total expenditures by O&M and direct charges to capital projects by year for 2010-2014.

#### Response:

Please refer to the response to BCUC IR 1.51.1.1.

52.2 Please provide the rate impact of amortizing the LMIPSU Development Costs deferral account over one year and two years. Show the calculation and include the requested information in the form of a fully functioning electronic spreadsheet.

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1 **Response:**

2 The following table summarizes the rate impact of amortizing the LMIPSU Development Costs  
3 over one year and over two years.

4 The rate impact of amortizing the costs over one year is approximately \$0.015 per GJ and the  
5 rate impact of amortizing the costs over two years is \$0.008 per GJ in 2016 and \$0.007 per GJ  
6 in 2017.

	1 Year Amort'n 2016	2 Year Amortization 2016 2017	
Amortization Expense	\$ 2,004	\$ 1,002	\$ 1,002
Income Tax	716	370	358
Earned Return	71	107	36
Total Revenue Requirement	<u>\$ 2,791</u>	<u>\$ 1,479</u>	<u>\$ 1,396</u>
Non-Bypass Sales / T-Service Volume TJ	187,832	187,832	187,832
<b>Average Rate Impact \$ / GJ</b>	<b>\$ 0.015</b>	<b>\$ 0.008</b>	<b>\$ 0.007</b>

7

8 Please refer to the tab labeled BCUC 1.52.2 in the fully functional electronic spreadsheet  
9 provided in Attachment 51.2 in the response to BCUC IR 1.51.2.

10

11

12

13 52.3 Please explain why 95 percent of the LMIPSU Development Costs are allocated  
14 to the Coquitlam Gate IP Project and 5 percent allocated to the Fraser Gate IP  
15 Project.

16

17 **Response:**

18 One of the benefits of managing the Projects concurrently is efficiencies in development work,  
19 which result in joint development costs. As such, an allocation methodology is required if the  
20 development costs are to be attributed to each Project. In this regard, FEI has used the relative  
21 lengths of the two pipeline projects as a reasonable basis to allocate the Development costs –  
22 95% to the Coquitlam Gate IP Project and 5% to the Fraser Gate IP Project.

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**Q. PUBLIC AND FIRST NATIONS CONSULTATION**

**53.0 Reference: Archaeology**

**Exhibit B-1, Section 6.2.2, p. 145**

**Archaeological Impact Assessment**

The utility states on page 145:

Potential archaeological and cultural impacts associated with the four areas of high archaeological potential will be further assessed during the AIA [Archaeological Impact Assessment], which will be undertaken once approval of this Application from the Commission is obtained and prior to construction.<sup>41</sup>

53.1 Please explain in detail the AIA completion and approval process. Please provide a step-by-step explanation of the process if appropriate.

**Response:**

FEI's archaeological consultant has applied for a Heritage Inspection Permit from the Archaeological Branch of the BC Ministry of Forests, Lands, and Natural Resource Operations. As part of this permitting process, the Archaeological Branch provides the permit application to all First Nations asserting traditional interest in the study area for comments. The AIA will be completed under this permit.

The AIA will be designed, implemented and reported upon in conformance with the BC Archaeological Impact Assessment Guidelines and per the Heritage Conservation Act permit obligations. In areas of archaeological potential, the AIA may involve surface surveys, hand-dug test pits, machine excavated test pits, boreholes, etc., as determined by the archaeologist. If any artifacts are encountered during the AIA, they must be stored in a predetermined secure repository approved by the Archaeological Branch. First Nations representatives will be part of the archaeological team undertaking the AIA.

Upon completion of the AIA, a final report must be prepared and submitted to the Archaeological Branch fulfilling all requirements of the permit.

More details on the AIA processes are attached as Attachment 53.1. Please note that the same information can also be found at the BC Archaeological Branch website.

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<sup>41</sup> Exhibit B-1, p. 145.

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53.1.1 Please specify who (i.e. what government or other agency) will oversee the completion and results of the AIA? If the AIA confirms archaeologically significant areas, who will oversee FEI's response to the AIA's findings or mitigation strategies?

**Response:**

The AIA requires a Heritage Inspection Permit issued by the Archaeological Branch of the BC Ministry of Forests, Lands, and Natural Resource Operations. As a requirement of the permit, all findings must be reported to the Archaeological Branch for its review and acceptance.

In addition, if the Projects are approved and therefore proceed to permitting under the OGC, then the OGC will also review the findings and mitigation strategies when the Archaeological Assessment Information Form (AAIF) and the AIA are submitted as part of the OGC permitting process.

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**54.0 Reference: Public Consultation**

**Exhibit B-1, Section 7.3.1.1, p. 158**

**Communications and Consultation Plan**

The utility states on page 158:

In early 2014, after consulting with companies who have expertise and knowledge of industry leading practices in public consultation, FEI determined it would host a series of five information sessions spaced out across the four communities...

Letters that included detailed information about the five sections and the public information sessions were mailed to 8,000 residents within 200 metres of the existing pipelines in May 2014.<sup>42</sup>

54.1 Did FEI consider the public consultation plans of other utilities or other businesses when designing its consultation plan for the project? If so, which other utilities/businesses and what were the lessons learned and adopted from those plans.

**Response:**

To ensure that FEI consulted adequately with the public, it sought input from a variety of organizations and experts in this field when designing the Company's public consultation plan. For example, FEI had input from the Cities of Vancouver, Burnaby and Coquitlam to identify public engagement and communication strategies they undertake when planning and constructing large-scale projects that impact roads. In addition, FEI also had input from BC Hydro, who is currently planning projects in the Lower Mainland. Further, meetings with TransLink regarding this project yielded lessons learned and advice about its public engagement approaches with the Evergreen line. In addition to this, FEI engaged a consultant with experience in this field to offer guidance and advice.

Lessons learned from these discussions included:

- Engaging the public at an early stage in a large scale project;
- Providing the public with as much information as possible in order for it to understand the project and ask informed questions;
- Engaging elected officials at all levels of government; and
- Engaging potentially affected First Nations communities.

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<sup>42</sup> Exhibit B-1, p. 158.

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54.1.1 From approximately 2008 to 2012 the BC Transmission Corporation undertook public consultation related to its Vancouver City Central Transmission Project which was a project that was routed underground in urban areas and through a park. Has FEI reviewed this plan? If so, what were the lessons learned and adopted?

**Response:**

The City of Vancouver has recommended FEI look to the Vancouver City Central Transmission project (VCCT) as a model of best practices for public engagement and communication. FEI has examined the available public information on the VCCT project, but at this time has not met with BC Hydro to discuss the VCCT matter specifically.

FEI, however, did hold discussions with BC Hydro on its public engagement effort for the Metro North Transmission Study, which is a project that is currently being planned in the Lower Mainland. Shared information strengthened the FEI Communication and Consultation Plan by ensuring that elected officials are regularly informed and updated as project planning proceeds.

54.2 Were residents and businesses located within 200 metres of the existing pipeline mailed a notice? If not, how and when were businesses informed of the project at the outset of public consultation?

**Response:**

FEI confirms that residents and businesses located within 200 metres of the existing pipeline were mailed notices inviting them to public information sessions.

54.3 Were residents within 200 metres of all route options evaluated in the Application mailed a notice? If not, why not?

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**Response:**

FEI mailed notices to residents within 200 metres of the existing alignment, because the preferred alignment for the new pipeline generally followed this corridor.

While notices were not mailed to residents within 200 metres of all route options, FEI believed that the mailing that was sent was sufficient to adequately include those residents who may be affected by the Projects.

54.4 Were residents within 200 metres of the Lougheed route for section 6 mailed a notice? If not, why not?

**Response:**

Most, but not all, residents within 200 metres of the Lougheed Highway route for section 6 were mailed a notice because of their proximity to the original preferred route. At the time of the mailing, section 6 of Lougheed Highway was not considered to be a feasible route option and therefore, public information session attendees would not have received information about the Lougheed Route option for section 6.

Since the Lougheed Highway route for sections 5 and 6 is now being assessed as a potential route option, FEI is planning to invite all residents within 200 metres of the Lougheed Highway route for sections 5 and 6 to a public information session in April.

54.5 If the Lougheed route through section 6 becomes an option please provide detailed plans of how and when FEI will consult residents and businesses within 200 metres of that route.

**Response:**

If the Lougheed Highway route is deemed a viable option based on the Company's technical analysis, FEI will consult with those residents and businesses within 200 metres of the new route option. More specifically, FEI will hold a public information session similar to those held during the spring of 2014. This will include mailing invitations to each resident within 200



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- 1 metres of the proposed alignment, placing advertisements in local newspapers and preparing
- 2 information to be shared at the information session. The proposed information session is
- 3 scheduled to be held in April.

4



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**55.0 Reference: Public Consultation**

**Exhibit B-1, Section 4.3.4.6.2, p. 122**

**Communications and Consultation Plan**

The utility states on page 122:

Route Option 1 is located directly adjacent to the north bank of the Fraser River and would also traverse Gladstone Park. The proximity of Route Option 1 to the river would increase the potential for spills, sediment runoff or other potential negative environmental impacts. It is likely that the portion of Route Option 1 located in the park would also require some vegetation and tree removal.<sup>43</sup>

55.1 Please specify when and with whom FEI has consulted about Route Option 1's potential for spills, sediment runoff, other potential negative environmental impacts and tree removal.

**Response:**

To clarify, it is not the route alignment that increases the potential of spills, sediment runoff, or other potential negative environmental impacts. The potential for such incidents exists along all route alignments in this area. If a spill were to occur, the impact from that spill has the potential to be greater because of an alignment's proximity to the Fraser River.

FEI is in ongoing consultation with the City of Vancouver regarding all aspects of this Project and will address this particular aspect of the Project during a scheduled meeting with representatives from the City's Parks Department in March 2015.

55.1.1 Has FEI identified this potential impact to the First Nations it is consulting with?

**Response:**

Please refer to the response to BCUC IR 1.55.1 for clarification that the route alignment does not increase the potential of spills.

The Company sent a preliminary map and project fact sheet to First Nations with possible interest in the Projects, and met with those who requested further engagement. FEI has not

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<sup>43</sup> Exhibit B-1, p. 122.

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- 1 specifically identified this potential risk to the First Nations. The Company continues to engage
- 2 with those First Nations who have expressed interest in the Projects.

3

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1    **56.0    Reference:    Public Consultation**

2                                    **Exhibit B-1, Section 7.3, p. 157**

3                                    **Summary of Consultative Activities and Input Received**

4                    The utility states on page 157:

5                                    **Public consultation process:** the catchment area for consultation was  
6                                    challenged, as was the time in which stakeholders could provide input on this  
7                                    stage of the process.<sup>44</sup>

8                    56.1    Please provide more information on how specifically and why the catchment area  
9                                    for consultation was challenged. What was FEI's response to this challenge?

10

11    **Response:**

12    The catchment area was questioned by representatives of a community association located in  
13    the Grandview-Woodland neighbourhood of Vancouver, for which the City of Vancouver is in the  
14    process of developing an updated community plan. The community association is heavily  
15    involved in the plan's development and suggested that FEI follow a similar model, i.e.,  
16    consulting all City of Vancouver residents as opposed to those residing within the 200 metre  
17    corridor where the existing pipeline is located.

18    FEI responded by explaining its reasoning for the 200 metre notification catchment and its future  
19    plans for continuing consultation and engagement as the Projects proceed, and the community  
20    association had no further comments.

21

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<sup>44</sup> Exhibit B-1, p. 157.

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**57.0 Reference: Public Consultation**

**Exhibit B-1, Section 7.3.1.2, p. 161; Exhibit B-1-1, Appendix C-14**

**Public Feedback from Highlawn Residents**

The utility states on page 161:

A total of 28 people attended the meeting where the Project team spoke to the alternative routes examined, the criteria against which they were evaluated, and how FEI selected its preferred route...Residents appeared to be dissatisfied with the selection process and outcome, and informed FEI that they would be seeking redress through a number of avenues.<sup>45</sup>

In Appendix C-14, a Highlawn resident states:

We definitely felt that the last meeting that was held was unproductive due to the disconnect between what was presented and the published intention for a consultation.<sup>46</sup>

The concerned residents of Highlawn would also request that FortisBC defer its November application to the BCUC until such time that it has completed a robust public consultation of affected residents, as we believe this is a requirement of your application.<sup>47</sup>

57.1 Please specify exactly when and by what method Highlawn residents were informed by FEI that it had filed a CPCN application with the BCUC and that a public hearing process had commenced.

**Response:**

Two representatives of the Highlawn residents were notified by email the day after FEI filed the CPCN application with the BCUC. One of these representatives was Frank Ong, who is registered as an intervenor in the subject proceeding and was nominated on behalf of the Highlawn residents to lead the contact with FEI and the discussions.

<sup>45</sup> Exhibit B-1, p. 161.

<sup>46</sup> Exhibit B-1-1, Appendix C-14, October 23, 2014 email.

<sup>47</sup> Exhibit B-1-1, Appendix C-14, October 16, 2014 email.

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57.2 Please provide more information on the dissatisfaction residents expressed at the meeting and the redress they plan to seek.

**Response:**

At a meeting with FEI on October 7, 2014, Highlawn residents expressed dissatisfaction with the following elements that contributed to the determination of a preferred route, and sought disclosure of the documents that supported the determination:

1. Evaluation criteria and decision matrix used in the analysis;
2. Ranking, results and commentary for each of the proposed routes;
3. Traffic impact study and terms of reference (assumptions and constraints) that was performed for each of the proposed routes and Lougheed Highway; and
4. Construction specifications for installing the proposed pipeline (depth, width and vertical clearance requirements).

Further, they inquired about whether the City of Burnaby could overrule FEI and about the process of engaging with the Commission. FEI provided information on how they could apply to the BC Utilities Commission to become interveners in the CPCN application review process.

57.3 What could FEI have done better so that Highlawn residents believe FEI has undertaken a robust public consultation process and so that they did not feel there was a disconnect between what was presented by FEI and the published intention for consultation? How will FEI do things differently in ongoing consultation with Highlawn residents and other affected parties?

**Response:**

The statement referenced above and made by the Highlawn residents relates to a meeting FEI hosted subsequent to the public information session. It was intended to allow FEI to present the five route options studied over the previous four months – some suggested by Highlawn residents at the May public information session and others identified by FEI – and the rationale for selecting the preferred route. The invitation can be found at Exhibit B-1-1, Appendix C-12, September 18, 2014 Letter to Highlawn Drive Residents. It states “We are now ready to invite

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1 residents on Highlawn Drive to a meeting to discuss all these routes and confirm a preferred  
2 route.”

3 At this meeting FEI reconfirmed its preferred route to be along Highlawn Drive, to the  
4 disappointment of those in attendance. Attendees prevented the FEI presentation from  
5 proceeding to completion by interrupting presenters and repeatedly questioning the evaluation  
6 process. They asked FEI to provide traffic studies and other analysis that contributed to the  
7 route selection process; FEI explained this information would be available once the CPCN  
8 application was filed with the Commission.

9 Also at this meeting, Highlawn residents expressed their belief that more of their neighbours  
10 would have learned about the invitation to a public information session if FEI had indicated, on  
11 the envelope containing the invitation, that “important invitation was enclosed”. Many said that  
12 the letter addressed to “resident” was generic, and could be mistaken for junk mail, and  
13 therefore discarded before opening.

14 In future, FEI will ensure posted material more clearly indicates the item is an invitation to a  
15 public information session or other consultation activities. For example, a postcard style mail  
16 out will include public information and invitation details without the need for the recipient to open  
17 an envelope.

18

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**58.0 Reference: Public Consultation**

**Exhibit B-1, Section 7.5, p. 171; Exhibit B-1-1, Appendix C-1, pp. 7–8**

**Sufficiency of the Consultation Process**

The utility states on page 171:

In particular, consultation and communication with land owners, residents, and businesses directly affected by the Projects and with the municipalities of Coquitlam, Burnaby, and Vancouver has been both useful and productive, and has been incorporated into FEI's plans for the Projects.<sup>48</sup>

The utility states in Appendix C-1:

A strategic decision needs to be made regarding stakeholder engagement, specifically whether engagement will aim to provide information and a rationale for the upgrades, or whether engagement will allow the public to provide input into the upgrades and how that input will be considered by FEI.<sup>49</sup>

58.1 Please specify the feedback, suggestions or other that FEI heard from land owners, residents and businesses and then incorporated into its plans for the Projects? How has public consultation changed the Projects if at all?

**Response:**

Between September 2013 and December 2014, FEI held many meetings with stakeholders, business owners, governments and residents. They provided input on various topics, such as how frequently to communicate with the travelling public during construction, route alignments, and future legacy projects.

With respect to communication during construction, FEI is now aware of other construction projects planned during the same time period and will work with other utilities and municipalities to mitigate impacts to communities and the travelling public.

With respect to route alignments, FEI had the opportunity to consider and evaluate options that were suggested during public information sessions. After gathering information on impacts, FEI met again with residents to review the assessments and discuss why the options were not feasible.

FEI has continuing meetings with each of the municipalities on legacy projects that would benefit the communities and align with municipal priorities.

<sup>48</sup> Exhibit B-1, p. 171.

<sup>49</sup> Exhibit B-1-1, Appendix C-1, p. 7.

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In addition, through consultation with Burnaby City Council, FEI learned that the municipality would prefer that the Coquitlam Gate IP Project be routed along Lougheed Highway, south of the Brentwood Town Centre, in the West Burnaby area. Based on preliminary feedback from Burnaby early in the Project planning, FEI did not consider this route to be feasible. However, based on the more recent information about the City council's position, FEI has responded by re-considering and evaluating the Lougheed Highway alignment to determine whether it is constructible and could be a feasible alignment.

58.2 What strategic decision was made regarding stakeholder engagement? If it was not to allow the public to provide input into the upgrades, please explain why not. How will public input be considered by FEI?

**Response:**

The strategic decision made with respect to stakeholder engagement involved how to consider stakeholder feedback in the analysis of routing options. Since the Coquitlam Gate IP Project involved fixed beginning and end points with opportunity for only minor routing deviations along the route (due to the requirement to tie in the new gas line with existing lateral gas lines), the decision was made that public input on routing options would not form part of the non-financial route selection criteria. That being said, public input is being considered in several ways, as demonstrated by:

- being a catalyst for the decision to further assess the Lougheed Highway as a potential route option;
- FEI assessing a route through a school yard and park in West Burnaby which had been suggested by members of the public at a public information session, however which was later found to be not feasible; and
- FEI increasing its understanding of traffic complexities that will need to be incorporated into traffic planning during construction, which was brought to FEI's attention at a public information session held in Coquitlam.

Public input into other aspects of the Project is described in the response to BCUC IR 1.58.1.



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58.3 On page 8 of Appendix C-1, FEI mentions Dark Site as a tactic. Please explain what a Dark Site is and how it will be used in public consultation.

**Response:**

FEI engaged an external public relations firm with experience in public consultation methods and protocols to create a Communication and Consultation plan. The plan provided recommendations on how to engage with and inform land owners, community stakeholders and those who frequently travel along the proposed upgrade routes, as well as other stakeholders. “Dark Site” is a common public relations term to describe an approach used primarily in crisis communications plans that can help organizations deal with incidents that threaten their operations and reputation or the health and safety of employees and customers. A “Dark Site” is essentially a web page held in reserve, established with key messages and relevant content that includes information on where the public and media can contact the organization. Such sites can be created in anticipation of the crisis most likely to face an organization, such as a power outage at a hospital that may impact patients relying on life-saving equipment. Because such information would already be vetted by the appropriate approvers from the relevant business areas (eg. media relations, legal, operations), the information on such sites can be quickly updated and published, going ‘live’ within a few minutes and greatly aiding an organization dealing with a crisis.

A “Dark Site” was identified as a possible tactic by the external public relations firm; however, FEI determined it to be not appropriate or useful in consulting with and engaging stakeholders in these Projects.

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1    **59.0    Reference:    FIRST NATIONS CONSULTATION**

2                                **Exhibit B-1, Section 8.2.1, p. 174; Section 8.5.1, p. 179**

3                                **Oil and Gas Commission (OGC) Process Regarding First Nations**  
4                                **Consultation**

5                                The utility states on page 174:

6                                Where appropriate, FEI will, together with the Crown agencies responsible for  
7                                First Nation consultation, identify methods to avoid or mitigate potential impacts  
8                                on those First Nations' interests, and, where appropriate, discuss and develop  
9                                options for accommodation.<sup>50</sup>

10                              The utility states on page 179 "The OGC is a Crown agency responsible for First Nations  
11                              consultation, and, if necessary, accommodation of First Nations' interests."<sup>51</sup>

12                              59.1    Is the OGC the only Crown agency responsible for First Nations consultation for  
13                              the Project?

14  
15    **Response:**

16    FEI understands that the OGC is the only Crown agency responsible for conducting consultation  
17    with First Nations for the Projects on behalf of the Crown.

18  
19

20  
21                              59.2    Has the OGC or any other Crown agency officially delegated consultation  
22                              authority to FEI?

23  
24    **Response:**

25    The OGC has not officially delegated consultation authority to FEI.

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29                              59.3    Please provide FEI's analysis of the BCUC's role in relation to that of the OGC in  
30                              assessing the adequacy of First Nations consultation for the Project.

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<sup>50</sup> Exhibit B-1, p. 174.

<sup>51</sup> Exhibit B-1, p. 179.

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**Response:**

The roles of different administrative agencies or tribunals with respect to assessing First Nations consultation is clarified in the Supreme Court of Canada decision *Rio Tinto Alcan Inc. v. Carrier Sekani Tribal Council*, [2010] 2 SCR 650, 2010 SCC 43, which is provided as Attachment 59.3 for convenience. Please see in particular sections B and C of the reasons of the Court. For instance, the Court held:

*[55] The duty on a tribunal to consider consultation and the scope of that inquiry depends on the mandate conferred by the legislation that creates the tribunal. Tribunals are confined to the powers conferred on them by their constituent legislation: R. v. Conway, 2010 SCC 22 , [2010] 1 S.C.R. 765. It follows that the role of particular tribunals in relation to consultation depends on the duties and powers the legislature has conferred on it.*

...

*[60] ... A tribunal has only those powers that are expressly or implicitly conferred on it by statute. In order for a tribunal to have the power to enter into interim resource consultations with a First Nation, pending the final settlement of claims, the tribunal must be expressly or impliedly authorized to do so. The power to engage in consultation itself, as distinct from the jurisdiction to determine whether a duty to consult exists, cannot be inferred from the mere power to consider questions of law. Consultation itself is not a question of law; it is a distinct and often complex constitutional process and, in certain circumstances, a right involving facts, law, policy, and compromise. The tribunal seeking to engage in consultation itself must therefore possess remedial powers necessary to do what it is asked to do in connection with the consultation. The remedial powers of a tribunal will depend on that tribunal's enabling statute, and will require discerning the legislative intent: Conway, at para. 82.*

*[61] A tribunal that has the power to consider the adequacy of consultation, but does not itself have the power to enter into consultations, should provide whatever relief it considers appropriate in the circumstances, in accordance with the remedial powers expressly or impliedly conferred upon it by statute. The goal is to protect Aboriginal rights and interests and to promote the reconciliation of interests called for in Haida Nation.*

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- 1 The Commission, in its role as a quasi-judicial tribunal, does not itself have an independent duty
- 2 to consult First Nations. Rather, it is the Crown (through the OGC in the case of the Projects),
- 3 that has a legal duty to consult First Nations when making decisions that may affect Aboriginal
- 4 and treaty rights.
- 5

**Attachment 37.1**

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#### REFERENCE

1. IMAGERY OBTAINED FROM GOOGLE EARTH PRO, USED UNDER LICENSE.  
IMAGERY DATE: FEBRUARY 26, 2015.  
GOOGLE EARTH IMAGE IS NOT TO SCALE.

DRAFT



PROJECT		FORTIS BC FRASER GATE IP PIPELINE UPGRADE VANCOUVER, B.C.	
TITLE		ZONES OF SIGNIFICANT LATERAL GROUND DISPLACEMENT	
	PROJECT No.	0714110027-5029	FILE No. 0714110027-5029-1000-03
	DESIGN	VF	2015-02-26
	CADD	JHL	2015-02-26
	CHECK		
REVIEW			
SCALE		AS SHOWN	
		FIGURE	
		4-3	



## **Attachment 47.1.1**

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### **REFER TO LIVE SPREADSHEET MODEL**

Provided in electronic format only

**FILED CONFIDENTIALLY**

(accessible by opening the Attachments Tab in Adobe)

## **Attachment 51.2**

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### **REFER TO LIVE SPREADSHEET MODEL**

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**Attachment 53.1**

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Printer Version

## Ministry of Forests, Lands and Natural Resource Operations

### ARCHAEOLOGY

## Archaeological Impact Assessment Process

- [Purpose](#)
- [Mandate](#)
- [Authority](#)
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### PURPOSE:

The purpose of this directive on the archaeological impact assessment process is to provide guidance to Archaeology Branch staff, other government agencies and the public on the process for assessment and management of adverse impacts to archaeological sites. Archaeological impact assessment studies are initiated in response to development proposals that will potentially disturb or alter archaeological sites. The role of the branch is not to prohibit or impede land use and development, but rather to assist the Provincial Government and private sector in making decisions that will ensure effective management of archaeological resources as well as optimal land use.

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### MANDATE:

To encourage and facilitate the protection and conservation of archaeological sites, in accordance with the provisions of the [Heritage Conservation Act](#) (1996, RSBC, Chap. 187), through participation in project reviews under British Columbia's [Environmental Assessment Act](#) (1996, RSBC, Chap. 119) as well as smaller scale developments referred to the branch by agencies and individuals in both the public and private sectors. Details for carrying out this mandate are expanded upon in the *British Columbia Archaeological Impact Assessment Guidelines* (Archaeology Branch 1995) available from the Archaeology Branch, and the *Guide to the British Columbia Environmental Assessment Process*, available from the Environmental Assessment Office.

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### AUTHORITY:

Legislative authority derives from the Heritage Conservation Act (1996, RSBC, Chap. 187, s. 12, 13 and 14) and the Environmental Assessment Act (1996, RSBC, Chap. 119, s. 7, 19 and 22).

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- + Kwäday Dän Ts'ínchi

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## POLICY STATEMENT:

The Archaeology Branch will take the following courses of action where its legislated and program responsibilities are potentially affected by proposed development projects: (1) review Applications and Project Reports referred by the Environmental Assessment Office (EAO), as well as participate in Environmental Assessment Board hearings convened under the Environmental Assessment Act, and (2) review any other developments referred to the branch from the public or private sector.

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## PROCEDURES

Upon receipt of an Application or Project Report pursuant to the Environmental Assessment Act, the following procedures will normally be undertaken:

- ➔ the Manager, Permitting and Assessment Section will assign the Application to a Project Officer for screening to determine whether or not branch responsibilities may be affected;
- ➔ in screening the Application, the Project Officer will normally review the archaeological overview assessment report, if it is included with the Application, or utilize available information such as the provincial archaeological site inventory, archaeological permit and non-permit reports, topographic maps, and airphotos;
- ➔ in cases where impacts to archaeological resources are considered unlikely, the Project Officer will normally advise the Project Assessment Director (EAO) accordingly and decline further branch involvement in the project review;
- ➔ in cases where impacts to archaeological resources are considered likely, the Project Officer will normally request membership on the Project Committee established to review the proposed project;
- ➔ following a detailed project review, the Project Committee will make a recommendation to the responsible ministers to: (1) undergo further project review, (2) issue a project approval certificate, or (3) deny a project approval certificate;
- ➔ where a project is to undergo further review, the Project Officer will formulate specifications for an archaeological impact assessment, to be reported in a Project Report;
- ➔ Project Reports are reviewed by the Project Committee, and a recommendation is made to the responsible ministers to: (1) certify the project, (2) not certify the project, or (3) refer the project to the Environmental Assessment Board for a public hearing;
- ➔ where a public hearing is directed and unresolved archaeological resource management issues remain, the Project Officer will address these in the terms of reference for the hearing.

Upon receipt of a development referral, the following procedures will normally be undertaken:

- ➔ the Manager, Archaeological Permitting and Assessment Section, will assign the referral to a Project Officer for review;
- ➔ in reviewing a referral, the Project Officer will normally utilize available information such as the provincial archaeological site inventory, archaeological permit and non-permit reports, topographic maps, and airphotos;
- ➔ the Project Officer will normally respond to the referral within the time period stipulated;
- ➔ in cases where the proposed development is likely to damage recorded or possibly damage unrecorded archaeological sites protected under the *Heritage Conservation Act*, the Project Officer will normally advise the referral agency or proponent to have an archaeological impact assessment undertaken prior to initiating the development;
- ➔ in cases where there is limited potential for damage, the Project Officer will normally advise the referral agency or proponent of the procedures to be followed in the event that archaeological remains are unexpectedly encountered during development;

- ➔ in cases where damage is unlikely, the referral agency or proponent will normally be advised that the branch does not object to the development proceeding as proposed.

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## Ministry of Forests, Lands and Natural Resource Operations

### ARCHAEOLOGY

#### Heritage Permits

- [Purpose](#)
- [Mandate](#)
- [Authority](#)
- [Policy Statement](#)
- [Review Procedures](#)
- [Permit Reporting Procedures](#)

Issued: January 26, 1996

Revised: March 12, 1999

#### PURPOSE:

The purpose of this directive on Heritage Permits is to provide guidelines to Archaeology Branch staff and permit applicants as to the information the branch should take into account when reviewing applications, the general procedures to be followed by branch staff in processing an application, and the general procedures that should be followed upon issuance of permits.

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#### MANDATE:

Pursuant to section 13 of the [Heritage Conservation Act](#) (1996, RSBC, Chap. 187), a permit issued under section 12 or 14 is required before a person can undertake any actions affecting heritage objects as referred to in subsection 13(1) or affecting heritage sites as referred to in subsection 13(2), or any activities referred to in subsection 14(1) of the Act.

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#### AUTHORITY:

Pursuant to Section 12(1) and Order in Council 1254 (1995), the Director of the Archaeology Branch and the Manager, Permitting and Assessment Section, have been authorized in writing by the Minister to exercise the powers of the Minister to issue permits under Sections 12(2) and 14(2) of the Heritage Conservation Act (1996, RSBC, Chap. 187).

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## POLICY STATEMENT:

There are three basic categories of activities for which permits are most often sought: academic research, resource management, and alterations to sites to facilitate development. Academic research and resource management activities most often require heritage investigation or inspection permits pursuant to Section 14(2), while alteration permits are sought under the provisions of Section 12(2).

When making a decision or recommendation as to issuance of a permit under sections 12(2) and 14(2) of the Heritage Conservation Act, the Archaeology Branch should take into account the following:

- the nature and justification of proposed activities;
- the training, experience and logistical ability of an applicant to successfully complete the proposed activities (inspection and investigation permits only);
- comments provided by any First Nation known to assert a traditional interest in the area of the proposed activities; and
- other relevant information.

For academic research permits, the branch will consider all of the following criteria or equivalent information as it applies to the person carrying out the work being authorized (applicant or field director if different from the applicant):

- BA degree in archaeology, or anthropology with a specialty in archaeology, or is an advanced student (third or fourth year) working under the direction of a supervisor who has previously held a permit;
- experience conducting archaeological site survey (approx. 20 working days);
- experience conducting archaeological excavation (approx. 60 working days) that includes approximately 20 days supervising excavations (investigation permits only);
- compliance with all requirements and conditions of previous permits held (if any);
- access to facilities and the services of related specialists required to carry out field work, analysis and report preparation;
- can arrange for the proper curation of recovered cultural materials at a repository that is acceptable to the Archaeology Branch.

For resource management permits, as decisions are often irreversible and can form the basis of subsidiary decisions that may result in the loss of archaeological resources, additional qualifications are desirable. In these cases, the branch will consider all of the following criteria or equivalent information as it applies to the person carrying out the work being authorized (applicant or field director if different from the applicant):

- MA degree in archaeology, or anthropology with a specialty in archaeology, or BA degree with an equivalent combination of post-graduate training and experience;
- experience in archaeological resource management (approx. 360 working days) that includes approximately 40 days supervising archaeological impact assessments in the general culture area for which the permit is sought (e.g., Northwest Coast, Interior Plateau, Sub-Arctic/Northern Boreal Forest);
- experience conducting archaeological excavation (approx. 60 working days) that includes approximately 20 days supervising mitigation projects (investigation permits only);
- senior author of an archaeological impact assessment report consistent with the reporting guidelines outlined in Appendix A of the British Columbia Archaeological Impact Assessment Guidelines;
- compliance with all requirements and conditions of previous permits held (if any);
- access to facilities and the services of related specialists required to carry out field work, analysis and report preparation;
- can arrange for the proper curation of recovered cultural materials at a repository that is acceptable to the Archaeology Branch.

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## REVIEW PROCEDURES

Upon receipt of an application for permit in the Archaeology Branch, the following procedures will normally be undertaken:

- the Manager, Permitting and Assessment, assigns the application to a Project Officer for internal review (a peer review may also be conducted if appropriate);
- the Project Officer reviews the Application for completeness of information; if found incomplete, additional information is requested from the applicant;
- complete Applications are referred by the Manager to First Nations asserting traditional interest in the proposed study area, with a request for comment, preferably in writing, within a reasonable time, usually 15-30 days;
- written comments that identify concerns over the study methodology are referred by the Manager to the applicant for response;
- the Manager makes a decision as to permit issuance, or makes a recommendation to the Director, Archaeology Branch, with respect to issuance, based on the review comments provided by both the Project Officer and First Nation(s).

Permits will be issued from the Archaeology Branch in a standard format and, pursuant to section 12(3) of the Act, may include specific requirements, specifications or conditions the issuing authority considers appropriate. Generally, the following terms and conditions will apply to all heritage inspection and investigation permits involving archaeological activities:

- permits shall only be valid for the term stipulated on the permit form, unless otherwise cancelled. Extensions will be considered upon submission of an application at least 30 days prior to the expiry date of the permit;
- permit-holders shall provide the branch with two bound copies of a written report outlining the work carried out under the terms of the permit;
- a person designated by the branch may at any time inspect work authorized by permits, including records and materials recovered;
- upon completion of any inspections or investigations involving excavations or other site alterations, permit-holders shall make all reasonable efforts to restore sites as nearly as possible to their former condition;
- permit-holders must utilize any recording forms, formats or systems required by the branch;
- archaeological impact assessment and management studies must conform with the British Columbia Archaeological Impact Assessment Guidelines (Archaeology Branch 1998);
- prior to permit issuance, permit-holders must arrange for a secure repository to curate any materials that may be collected under the authority of the permit.

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## **PERMIT REPORTING PROCEDURES:**

Generally, the deadline for submission of written reports to the branch shall be four months after the completion of field work, unless otherwise agreed to by the branch and the applicant during the application review process.

Upon issuance of a heritage inspection permit for a site survey (inventory or assessment), the following reporting procedures will generally apply:

- only temporary site numbers are to be used in the field - permanent site numbers will not be assigned by the branch until completed site inventory forms have been submitted;
- British Columbia Archaeological Site Inventory Forms must be submitted to the branch, prior to or at the same time as the permit report, for all sites recorded during the survey and should contain 1:50,000 scale NTS map inserts with site locations accurately plotted;
- permit reports submitted to the branch must be accompanied by 1:50,000 scale NTS map inserts with site locations accurately plotted if not submitted with site forms;
- the provenience of all excavated and surface collected archaeological materials must be recorded where possible.

Upon issuance of a heritage investigation permit for systematic data recovery or extensive research excavations, the following recording and reporting procedures will generally apply:

- ➔ establishment of horizontal base lines related to a permanent reference point or datum;
- ➔ establishment of a permanent vertical datum from which to calculate all depth measurements;
- ➔ preparation of an accurate site map delineating all reference points and ground contours;
- ➔ use of a field journal to document all pertinent site information, e.g., location of site map reference points, excavation unit selection criteria, etc.;
- ➔ keep accurate records of artifact provenience, and natural and cultural associations;
- ➔ record provenience for, and objective descriptions on, natural and cultural matrices (aids such as Munsell soil colour charts should be utilized);
- ➔ submission of updated site inventory forms with preliminary reports.

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## Ministry of Forests, Lands and Natural Resource Operations

### ARCHAEOLOGY

## Archaeological Impact Assessment Guidelines

### 3.0 Archaeological Impact Assessment and Review Process

#### Part 3 of 4

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##### → [3.5.1 Inventory](#)

###### → [3.5.1.1 Site Surveying](#)

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##### → [3.5.2 Assessment](#)

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###### → [3.5.2.3 Assessing Impacts](#)

### 3.5 Impact Assessment

An archaeological impact assessment will be required where potential impacts to archaeological resources are identified in the overview study. The impact assessment is designed to gain the fullest possible understanding of archaeological resources which would be affected by the project.

The primary objectives of the impact assessment are to:

- a. identify and evaluate archaeological resources within the project area;
- b. identify and assess all impacts on archaeological resources which might result from the project; and
- c. recommend viable alternatives for managing unavoidable adverse impacts including a preliminary program for;
  - i. implementing and scheduling impact management actions and, where necessary,
  - ii. conducting surveillance and/or monitoring

Information provided by the impact assessment is intended to assist the proponent in choosing a suitable

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approach to designing, planning and implementing the proposed project while giving consideration to archaeological resources. In the course of fulfilling these basic objectives, it is often possible to conduct problem-oriented research aimed at enhancing scientific knowledge and public appreciation of British Columbia's archaeological resources. The effective integration of management and research is a desirable quality of impact assessment studies and should be recognized as an integral part of such studies.

Two basic research activities are associated with the impact assessment level of study: (1) inventory, and (2) impact identification and assessment. Due to uncertainty as to the number or types of archaeological sites which might be encountered during the inventory stage, it is often preferable to separate that stage from the impact identification and assessment stage.

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### **3.5.1 Inventory**

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➔ [3.5.1.5 Site Recording](#)

Inventory studies involve the in-field survey and recording of archaeological resources within a proposed development area. The nature and scope of this type of study is defined primarily by the results of the overview study. In the case of site-specific developments, direct implementation of an inventory study may preclude the need for an overview.

There are a number of different methodological approaches to conducting inventory studies. Therefore, the proponent, in collaboration with an archaeological consultant, must develop an inventory plan for review and approval by the Branch prior to implementation.

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#### **3.5.1.1 Site Surveying**

Site surveying is the process by which archaeological sites are located and identified on the ground. Archaeological site surveys often involve both surface inspection and subsurface testing.

A systematic surface inspection involves a foot traverse along pre-defined linear transects which are spaced at systematic intervals across the survey area. This approach is designed to achieve representative areal coverage. Alternatively, an archaeological site survey may involve a non-systematic or random walk across the survey area. Subsurface testing is an integral part of archaeological site survey. The purpose of subsurface testing, commonly called "shovel testing", is to:

- a. assist in the location of archaeological sites which are buried or obscured from the surveyor's view, and
- b. help determine the horizontal and vertical dimensions and internal structure of a site.

In this respect, subsurface testing should not be confused with evaluative testing ([section 3.5.2.1](#)), which is a considerably more intensive method of assessing site significance.

Once a site is located, subsurface testing is conducted to record horizontal extent, depth of the cultural matrix, and degree of internal stratification. Because subsurface testing, like any form of site excavation, is destructive it should be conducted only when necessary and in moderation.

Subsurface testing is usually accomplished by shovel, although augers and core samplers are also used where conditions are suitable. Shovel test units averaging 40 square cm are generally appropriate, and are excavated to a sterile stratum (i.e. C Horizon, glacial till, etc.). Depending on the site survey strategy, subsurface testing is conducted systematically or randomly across the survey area. Other considerations such as test unit location, frequency, depth and interval spacing will also depend on the survey design as well as various biophysical factors. All test units placed on a site must be accurately recorded and mapped.


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#### 3.5.1.2 Survey Sampling

Site survey involves the complete or partial inspection of a proposed project area for the purpose of locating archaeological sites. Since there are many possible approaches to field survey, it is important to consider the biophysical conditions and archaeological site potential of the survey area in designing the survey strategy.

Ideally, the archaeological site inventory should be based on intensive survey of every portion of the impact area, as maximum areal coverage will provide the most comprehensive understanding of archaeological resource density and distribution. However, in many cases the size of the project area may render a complete survey impractical because of time and cost considerations.

In some situations it may be practical to intensively survey only a sample of the entire project area. Sample selection is approached systematically, based on accepted statistical sampling procedures, or judgementally, relying primarily on subjective criteria.


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#### 3.5.1.3 Systematic Survey Sampling

A systematic sample survey is designed to locate a representative sample of archaeological resources within the project area. A statistically valid sample will allow predictions to be made regarding total resource density, distribution and variability. In systematic sample surveys it may be necessary to exempt certain areas from

intensive inspection owing to excessive slope, water bodies, landslides, land ownership, land use or other factors. These areas must be explicitly defined. Areas characterized by an absence of road access or dense vegetation should not be exempted.

The proponent is encouraged to seek professional consultation to ensure that the sampling methods selected for archaeological site survey are both appropriate and accurately applied. In this regard, survey sampling methods applied under similar environmental and project conditions should be consulted.



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#### **3.5.1.4 Judgemental Survey Sampling**

Under certain circumstances, it is appropriate to survey a sample of the project area based entirely on professional judgement regarding the location of sites. Only those areas which can reasonably be expected to contain archaeological sites are surveyed.

However, a sufficient understanding of the cultural and biophysical factors which influenced or accounted for the distribution of these sites over the landscape is essential. Careful consideration must be given to ethnographic patterns of settlement, land use and resource exploitation; the kinds and distribution of aboriginal food sources; and restrictions on site location imposed by physical terrain, climatic regimes, soil chemistry or other factors. A judgemental sample survey is not desirable if statistically valid estimates of total archaeological resource density and variability are required.



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#### **3.5.1.5 Site Recording**

Site survey includes the complete documentation of each identified site. All archaeological sites in British Columbia are recorded on standard site inventory forms available from the Branch.

The Archaeological Site Inventory Form Guide must be consulted when recording archaeological sites. This manual identifies the kinds of information to record and the procedures to follow in completing site inventory forms. Site forms should include a description of site characteristics, along with a map of the site drawn to scale. The map should illustrate the arrangement of site features, as well as the location of the site relative to the nearest recognizable and permanent landmark. Since these sites are often situated in remote areas, the map must be drawn in sufficient detail to allow easy relocation in the field. Legal descriptions should be provided wherever possible.

Site recording should also include a thorough description of all observed cultural materials. It is recommended that a representative selection of diagnostic artifacts or features be drawn to scale or photographed in situ. Drawings and photographs should be included with the inventory form.

Once completed, site inventory forms must be forwarded to the Branch. The Branch will assign a "Borden" identification number to each site and subsequently notify the proponent and/or his archaeological consultant as to which numbers have been assigned. Since Borden numbers can only be assigned by Branch staff, temporary site numbers must be used in the field.

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### **3.5.2 Assessment**

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Impact assessment studies are only required where conflicts have been identified between archaeological resources and a proposed development. These studies require an evaluation of the archaeological resource to be impacted, as well as an assessment of project impacts. The purpose of the assessment is to provide recommendations as to the most appropriate manner in which the resource may be managed in light of the identified impacts. Management options may include alteration of proposed development plans to avoid resource impact, mitigative studies directed at retrieving resource values prior to impact, or compensation for the unavoidable loss of resource values.

There are several methodological approaches that can be utilized in conducting an impact assessment. Therefore, the proponent's archaeological consultant must develop an impact assessment proposal for review and approval by the Branch prior to implementation.

It is especially important to utilize specialists at this stage of assessment. The evaluation of any archaeological resource should be performed by professionally qualified individuals. The involvement of researchers with varied expertise throughout this stage will help ensure that potentially significant data are not inadvertently overlooked.

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#### **3.5.2.1 Site Evaluation**

Techniques utilized in evaluating the significance of an archaeological site include systematic surface collecting and evaluative testing. Systematic surface collection is employed wherever archaeological remains are evident on the ground surface. However, where these sites contain buried deposits, some degree of evaluative testing is also required.

Surface collecting involves:

- a. placing an appropriate grid over the site area or some portion thereof;
- b. mapping, measuring, and recording all cultural items and other relevant materials observed within the grid system; and
- c. collecting and cataloguing recorded materials.

Systematic surface collection from archaeological sites should be limited, insofar as possible, to a representative sample of materials. Unless a site is exceptionally small and limited to the surface, no attempt should be made at this stage to collect all or even a major portion of the materials. Intensive surface collecting should be reserved for full scale data recovery if mitigative studies are required. Site significance is determined following an analysis of the surface collected and/or excavated materials.

Evaluative testing or "test excavation" is appropriate at archaeological sites containing buried cultural materials. Evaluative testing implies "controlled" excavation of a portion of such sites using established data recovery techniques. The objective is to gain a sufficient impression of the content and structure of a site so that a reliable evaluation of significance can be made. Evaluative testing will also provide necessary information for estimating the cost of full-scale excavation should this activity be necessary.

Evaluative testing involves:

- a. systematic excavation of one or more units by stratigraphic or arbitrary levels;
- b. mapping, measuring, and recording the horizontal and vertical provenience of all cultural items or other relevant materials observed within each excavation unit; and
- c. recovery and cataloguing of all cultural materials.

Profile drawings of the stratigraphy and features exposed in the walls of excavation units should also be prepared where appropriate. Site significance is based on the subsequent analysis and interpretation of recovered materials and the context in which they were found.

Evaluative testing should not be interpreted as a full-scale data recovery or mitigation operation since it is not intended to alleviate adverse impacts or resolve conflicts with a proposed project. The appropriate number of units to excavate for evaluative purposes will vary according to site characteristics such as horizontal and vertical extent, artifact density, and structural complexity. In some cases, a single excavation unit will be appropriate. In others, several units systematically or judgements placed across the site area will be required. Natural and artificial exposures, such as stream cut-banks and vehicle trails, should be used where possible to supplement data from excavation units.



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### 3.5.2.2 Significance Criteria

There are several kinds of significance, including scientific, public, ethnic, historic and economic, that need to be taken into account when evaluating archaeological resources. For any site, explicit criteria are used to measure these values. Checklists of criteria for evaluating pre-contact and post-contact archaeological sites are provided in [Appendix D](#) and [Appendix E](#). These checklists are not intended to be exhaustive or inflexible, and the user should add to and revise them as necessary. Innovative approaches to site

evaluation which emphasize quantitative analysis and objectivity are encouraged. The process used to derive a measure of relative site significance must be rigorously documented, particularly the system for ranking or weighting various evaluatory criteria.

Site integrity, or the degree to which an archaeological site has been impaired or disturbed as a result of past land alteration, is an important consideration in evaluating site significance. In this regard, it is important to recognize that although an archaeological site has been disturbed, it may still contain important scientific information.

Archaeological resources may be of scientific value in two respects. The potential to yield information which, if properly recovered, will enhance understanding of British Columbia's human history is one appropriate measure of scientific significance. In this respect, archaeological sites should be evaluated in terms of their potential to resolve current archaeological research problems. Scientific significance also refers to the potential for relevant contributions to other academic disciplines or to industry.

Public significance refers to the potential a site has for enhancing the public's understanding and appreciation of the past. The interpretive, educational and recreational potential of a site are valid indications of public value. Public significance criteria such as ease of access, land ownership, or scenic setting are often external to the site itself. The relevance of archaeological resource data to private industry may also be interpreted as a particular kind of public significance.

Ethnic significance applies to archaeological sites which have value to an ethnically distinct community or group of people. Determining the ethnic significance of an archaeological site may require consultation with persons having special knowledge of a particular site. It is essential that ethnic significance be assessed by someone properly trained in obtaining and evaluating such data (i.e. ethnologists, behavioral scientists, etc.).

Historic archaeological sites may relate to individuals or events that made an important, lasting contribution to the development of a particular locality or the province. Historically important sites also reflect or commemorate the historic socioeconomic character of an area. Sites having high historical value will also usually have high public value.

The economic or monetary value of an archaeological site, where calculable, is also an important indication of significance. In some cases, it may be possible to project monetary benefits derived from the public's use of an archaeological site as an educational or recreational facility. This may be accomplished by employing established economic evaluation methods; most of which have been developed for valuating outdoor recreation. The objective is to determine the willingness of users, including local residents and tourists, to pay for the experiences or services the site provides even though no payment is presently being made. Calculation of user benefits will normally require some study of the visitor population.



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### 3.5.2.3 Assessing Impacts

An archaeological resource impact may be broadly defined as the net change between the integrity of an archaeological site with and without the proposed development. This change may be either beneficial or adverse.

Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances an archaeological resource. For example, development may have a beneficial effect by preventing or lessening natural site erosion. Similarly, an action may serve to preserve a site for future investigation by covering it with a protective layer of fill. In other cases, the public or economic significance of an archaeological site may be enhanced by actions which facilitate non-destructive public use. Although beneficial impacts are unlikely to occur frequently, they should be included in the assessment.

More commonly, the effects of a project on archaeological sites are of an adverse nature. Adverse impacts occur under conditions that include:

- a. destruction or alteration of all or part of an archaeological site;
- b. isolation of a site from its natural setting; and
- c. introduction of physical, chemical or visual elements that are out-of-character with the archaeological resource and its setting.

Adverse effects can be more specifically defined as direct or indirect impacts. Direct impacts are the immediately demonstrable effects of a project which can be attributed to particular land modifying actions. They are directly caused by a project or its ancillary facilities and occur at the same time and place. The immediate consequences of a project action, such as slope failure following reservoir inundation, are also considered direct impacts.

Indirect impacts result from activities other than actual project actions. Nevertheless, they are clearly induced by a project and would not occur without it. For example, project development may induce changes in land use or population density, such as increased urban and recreational development, which may indirectly impact upon archaeological sites. Increased vandalism of archaeological sites, resulting from improved or newly introduced access, is also considered an indirect impact. Indirect impacts are much more difficult to assess and quantify than impacts of a direct nature.

Once all project related impacts are identified, it is necessary to determine their individual level-of-effect on archaeological resources. This assessment is aimed at determining the extent or degree to which future opportunities for scientific research, preservation, or public appreciation are foreclosed or otherwise adversely affected by a proposed action. Therefore, the assessment provides a reasonable indication of the relative significance or importance of a particular impact. Normally, the assessment should follow site evaluation since it is important to know what archaeological values may be adversely affected.

The assessment should include careful consideration of the following level-of-effect indicators, which are defined in [Appendix F](#):



- ➔ magnitude
- ➔ severity
- ➔ duration
- ➔ range
- ➔ frequency
- ➔ diversity
- ➔ cumulative effect
- ➔ rate of change

The level-of-effect assessment should be conducted and reported in a quantitative and objective fashion. The methodological approach, particularly the system of ranking level-of-effect indicators, must be rigorously documented and recommendations should be made with respect to managing uncertainties in the assessment.

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**Attachment 59.3**

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**Rio Tinto Alcan Inc. and British Columbia  
Hydro and Power Authority** *Appellants*

*v.*

**Carrier Sekani Tribal Council** *Respondent*

and

**Attorney General of Canada, Attorney  
General of Ontario, Attorney General  
of British Columbia, Attorney General  
of Alberta, British Columbia Utilities  
Commission, Mikisew Cree First Nation,  
Moosomin First Nation, Nunavut Tunngavik  
Inc., Nlaka’pamux Nation Tribal Council,  
Okanagan Nation Alliance, Upper Nicola  
Indian Band, Lakes Division of the  
Secwepemc Nation, Assembly of First Nations,  
Standing Buffalo Dakota First Nation, First  
Nations Summit, Duncan’s First Nation,  
Horse Lake First Nation, Independent Power  
Producers Association of British Columbia,  
Enbridge Pipelines Inc. and TransCanada  
Keystone Pipeline GP Ltd.** *Interveners*

**INDEXED AS: RIO TINTO ALCAN INC. v. CARRIER  
SEKANI TRIBAL COUNCIL**

**2010 SCC 43**

File No.: 33132.

2010: May 21; 2010: October 28.

Present: McLachlin C.J. and Binnie, LeBel, Deschamps,  
Fish, Abella, Charron, Rothstein and Cromwell JJ.

**ON APPEAL FROM THE COURT OF APPEAL FOR  
BRITISH COLUMBIA**

*Constitutional law — Honour of the Crown — Ab-  
original peoples — Aboriginal rights — Right to consul-  
tation — British Columbia authorized project altering  
timing and flow of water in area claimed by First Nations*

**Rio Tinto Alcan Inc. et British Columbia  
Hydro and Power Authority** *Appelantes*

*c.*

**Conseil tribal Carrier Sekani** *Intimé*

et

**Procureur général du Canada, procureur  
général de l’Ontario, procureur général  
de la Colombie-Britannique, procureur  
général de l’Alberta, British Columbia  
Utilities Commission, Première nation crie  
Mikisew, Première nation de Moosomin,  
Nunavut Tunngavik Inc., Conseil tribal de  
la nation Nlaka’pamux, Alliance des nations  
de l’Okanagan, Bande indienne d’Upper  
Nicola, Division des Grands lacs de la nation  
Secwepemc, Assemblée des Premières  
Nations, Première nation Standing Buffalo  
Dakota, Sommet des Premières nations,  
Première nation Duncan’s, Première nation  
de Horse Lake, Independent Power Producers  
Association of British Columbia, Enbridge  
Pipelines Inc. et TransCanada Keystone  
Pipeline GP Ltd.** *Intervenants*

**RÉPERTORIÉ : RIO TINTO ALCAN INC. c. CONSEIL  
TRIBAL CARRIER SEKANI**

**2010 CSC 43**

N° du greffe : 33132.

2010 : 21 mai; 2010 : 28 octobre.

Présents : La juge en chef McLachlin et les juges Binnie,  
LeBel, Deschamps, Fish, Abella, Charron, Rothstein et  
Cromwell.

**EN APPEL DE LA COUR D’APPEL DE LA  
COLOMBIE-BRITANNIQUE**

*Droit constitutionnel — Honneur de la Couronne —  
Peuples autochtones — Droits ancestraux — Droit à la  
consultation — La Colombie-Britannique a autorisé la  
construction d’un ouvrage modifiant le débit d’un cours*

*without consulting affected First Nations — Thereafter, provincial hydro and power authority sought British Columbia Utilities Commission's approval of agreement to purchase power generated by project from private producer — Duty to consult arises when Crown knows of potential Aboriginal claim or right and contemplates conduct that may adversely affect it — Whether Commission reasonably declined to consider adequacy of consultation in context of assessing whether agreement is in public interest — Whether duty to consult arose — What constitutes "adverse effect" — Constitution Act, 1982, s. 35 — Utilities Commission Act, R.S.B.C. 1996, c. 473, s. 71.*

*Administrative law — Boards and tribunals — Jurisdiction — British Columbia authorized project altering timing and flow of water in area claimed by First Nations without consulting affected First Nations — Thereafter, provincial hydro and power authority sought British Columbia Utilities Commission's approval of agreement to purchase power generated by project from private producer — Commission empowered to decide questions of law and to determine whether agreement is in public interest — Whether Commission had jurisdiction to discharge Crown's constitutional obligation to consult — Whether Commission had jurisdiction to consider adequacy of consultation — If so, whether it was required to consider adequacy of consultation in determining whether agreement is in public interest — Constitution Act, 1982, s. 35 — Utilities Commission Act, R.S.B.C. 1996, c. 473, s. 71.*

In the 1950s, the government of British Columbia authorized the building of a dam and reservoir which altered the amount and timing of water flows in the Nechako River. The First Nations claim the Nechako Valley as their ancestral homeland, and the right to fish in the Nechako River, but, pursuant to the practice at the time, they were not consulted about the dam project.

Since 1961, excess power generated by the dam has been sold by Alcan to BC Hydro under Energy Purchase Agreements ("EPAs") which commit Alcan to supplying and BC Hydro to purchasing excess electricity. The government of British Columbia sought the

*d'eau dans un territoire revendiqué par des Autochtones sans consulter au préalable les Premières nations touchées — La société d'État provinciale d'hydroélectricité a ensuite demandé à la British Columbia Utilities Commission d'approuver un contrat d'achat intervenu avec un producteur d'électricité privé — L'obligation de consulter naît lorsque la Couronne a connaissance de l'existence éventuelle d'une revendication autochtone ou d'un droit ancestral et qu'elle envisage une mesure susceptible d'avoir un effet défavorable sur cette revendication ou ce droit — La Commission a-t-elle agi raisonnablement en refusant de se pencher sur le caractère adéquat de la consultation alors qu'elle était appelée à déterminer si le contrat servait l'intérêt public? — L'obligation de consulter a-t-elle pris naissance? — Que faut-il entendre par « effet défavorable »? — Loi constitutionnelle de 1982, art. 35 — Utilities Commission Act, R.S.B.C. 1996, ch. 473, art. 71.*

*Droit administratif — Organismes et tribunaux administratifs — Compétence — La Colombie-Britannique a autorisé la construction d'un ouvrage modifiant le débit d'un cours d'eau dans un territoire revendiqué par des Autochtones sans consulter au préalable les Premières nations touchées — La société d'État provinciale d'hydroélectricité a ensuite demandé à la British Columbia Utilities Commission d'approuver un contrat d'achat intervenu avec un producteur d'électricité privé — La Commission avait le pouvoir de trancher des questions de droit et de décider si un contrat était dans l'intérêt public — Avait-elle compétence pour s'acquitter de l'obligation de la Couronne de consulter? — Avait-elle le pouvoir de se pencher sur le caractère adéquat de la consultation? — Dans l'affirmative, lui incombait-il de se pencher sur le caractère adéquat de la consultation pour décider si le contrat servait l'intérêt public? — Loi constitutionnelle de 1982, art. 35 — Utilities Commission Act, R.S.B.C. 1996, ch. 473, art. 71.*

Dans les années 1950, le gouvernement de la Colombie-Britannique a autorisé la construction d'un barrage et d'un réservoir qui ont modifié les débits d'eau dans la rivière Nechako. Les Premières nations prétendent que la vallée de la Nechako fait partie de leurs terres ancestrales et elles revendiquent le droit de pêcher dans la rivière Nechako, mais comme ce n'était pas l'usage à l'époque, elles n'ont pas été consultées relativement au barrage projeté.

Depuis 1961, Alcan vend les surplus d'électricité du barrage à BC Hydro au moyen de contrats d'achat d'électricité (« CAÉ ») dans lesquels elle s'engage à vendre l'électricité excédentaire, et BC Hydro à l'acheter. Le gouvernement de la Colombie-Britannique a demandé

Commission's approval of the 2007 EPA. The First Nations asserted that the 2007 EPA should be subject to consultation under s. 35 of the *Constitution Act, 1982*.

The Commission accepted that it had the power to consider the adequacy of consultation with Aboriginal groups, but found that the consultation issue could not arise because the 2007 EPA would not adversely affect any Aboriginal interest. The British Columbia Court of Appeal reversed the Commission's orders and remitted the case to the Commission for evidence and argument on whether a duty to consult the First Nations exists and, if so, whether it had been met. Alcan and BC Hydro appealed.

*Held:* The appeal should be allowed and the decision of the British Columbia Utilities Commission approving the 2007 EPA should be confirmed.

The Commission did not act unreasonably in approving the 2007 EPA. Governments have a duty to consult with Aboriginal groups when making decisions which may adversely impact lands and resources to which Aboriginal peoples lay claim. The duty to consult is grounded in the honour of the Crown and is a corollary of the Crown's obligation to achieve the just settlement of Aboriginal claims through the treaty process. While the treaty claims process is ongoing, there is an implied duty to consult with Aboriginal claimants on matters that may adversely affect their treaty and Aboriginal rights, and to accommodate those interests in the spirit of reconciliation. The duty has both a legal and a constitutional character, and is prospective, fastening on rights yet to be proven. The nature of the duty and the remedy for its breach vary with the situation.

The duty to consult arises when the Crown has knowledge, real or constructive, of the potential existence of the Aboriginal right or title and contemplates conduct that might adversely affect it. This test can be broken down into three elements. First, the Crown must have real or constructive knowledge of a potential Aboriginal claim or right. While the existence of a potential claim is essential, proof that the claim will succeed is not. Second, there must be Crown conduct or a Crown decision. In accordance with the generous, purposive approach that must be brought to the duty to consult, the required decision or conduct is not confined to government exercise of statutory powers or to decisions or conduct which have an immediate impact

à la Commission d'approuver le CAÉ de 2007. Les Premières nations ont fait valoir que ce dernier devait faire l'objet d'une consultation suivant l'art. 35 de la *Loi constitutionnelle de 1982*.

La Commission a reconnu avoir le pouvoir d'examiner le caractère adéquat de la consultation des groupes autochtones, mais elle a conclu que la question de la consultation ne pouvait se poser étant donné que le CAÉ de 2007 n'allait pas avoir d'effet préjudiciable sur quelque intérêt autochtone. La Cour d'appel de la Colombie-Britannique a annulé ses ordonnances et lui a renvoyé l'affaire pour qu'elle entende preuve et arguments sur la question de savoir s'il existait ou non une obligation de consulter les Premières nations et, dans l'affirmative, si elle avait été respectée. Alcan et BC Hydro ont interjeté appel.

*Arrêt :* Le pourvoi est accueilli, et la décision de la British Columbia Utilities Commission approuvant le CAÉ de 2007 est confirmée.

La Commission n'a pas agi de manière déraisonnable en approuvant le CAÉ de 2007. Un gouvernement a l'obligation de consulter les peuples autochtones avant de prendre des décisions susceptibles d'avoir un effet préjudiciable sur les terres et les ressources revendiquées par eux. L'obligation de consulter s'origine de l'honneur de la Couronne et c'est un corollaire de celle d'arriver à un règlement équitable des revendications autochtones au terme du processus de négociation de traités. Lorsque ce processus est en cours, la Couronne a l'obligation tacite de consulter les demandeurs autochtones sur ce qui est susceptible d'avoir un effet préjudiciable sur leurs droits issus de traités et leurs droits ancestraux, et de trouver des mesures d'accommodement dans un esprit de conciliation. L'obligation revêt un caractère à la fois juridique et constitutionnel. Elle est de nature prospective et prend appui sur des droits dont l'existence reste à prouver. La nature de l'obligation et le recours pour manquement à celle-ci varient en fonction de la situation.

L'obligation de consulter prend naissance lorsque la Couronne a connaissance, concrètement ou par imputation, de l'existence potentielle du droit ou titre ancestral revendiqué et qu'elle envisage une mesure susceptible d'avoir un effet préjudiciable sur celui-ci. Cette condition comporte trois éléments. Premièrement, la Couronne doit avoir connaissance, concrètement ou par imputation, de l'existence possible d'une revendication autochtone ou d'un droit ancestral. L'existence possible d'une revendication est essentielle, mais il n'est pas nécessaire de prouver que la revendication connaîtra une issue favorable. Deuxièmement, il doit y avoir une mesure ou une décision de la Couronne. Conformément à l'approche généreuse et téléologique que commande l'obligation de

on lands and resources. The duty to consult extends to “strategic, higher level decisions” that may have an impact on Aboriginal claims and rights. Third, there must be a possibility that the Crown conduct may affect the Aboriginal claim or right. The claimant must show a causal relationship between the proposed government conduct or decision and a potential for adverse impacts on pending Aboriginal claims or rights. Past wrongs, speculative impacts, and adverse effects on a First Nation’s future negotiating position will not suffice. Moreover, the duty to consult is confined to the adverse impacts flowing from the current government conduct or decision, not to larger adverse impacts of the project of which it is a part. Where the resource has long since been altered and the present government conduct or decision does not have any further impact on the resource, the issue is not consultation, but negotiation about compensation.

Tribunals are confined to the powers conferred on them by their constituent legislation, and the role of particular tribunals in relation to consultation depends on the duties and powers the legislature has conferred on them. The legislature may choose to delegate the duty to consult to a tribunal, and it may empower the tribunal to determine whether adequate consultation has taken place.

The power to engage in consultation itself, as distinct from the jurisdiction to determine whether a duty to consult exists, cannot be inferred from the mere power to consider questions of law. Consultation itself is not a question of law; it is a distinct, often complex, constitutional process and, in certain circumstances, a right involving facts, law, policy, and compromise. The tribunal seeking to engage in consultation must be expressly or impliedly empowered to do so and its enabling statute must give it the necessary remedial powers.

The duty to consult is a constitutional duty invoking the honour of the Crown. It must be met. If the tribunal structure set up by the legislature is incapable of dealing with a decision’s potential adverse impacts on Aboriginal interests, then the Aboriginal peoples affected must seek appropriate remedies in the courts. These remedies have proven time-consuming and expensive, are often ineffective, and serve the interest of no one.

consulter, cette mesure ou cette décision ne s’entend pas uniquement de l’exercice d’un pouvoir conféré par la loi ni seulement d’une décision ou d’un acte qui a un effet immédiat sur des terres et des ressources. L’obligation de consulter naît aussi d’une « décision stratégique prise en haut lieu » qui est susceptible d’avoir un effet sur des revendications autochtones et des droits ancestraux. Troisièmement, il doit être possible que la mesure de la Couronne ait un effet sur une revendication autochtone ou un droit ancestral. Le demandeur doit établir un lien de causalité entre la mesure ou la décision envisagée par le gouvernement et un effet préjudiciable éventuel sur une revendication autochtone ou un droit ancestral. Un acte fautif antérieur, une simple répercussion hypothétique et un effet préjudiciable sur la position de négociation ultérieure d’une Première nation ne suffisent pas. Aussi, l’obligation de consulter ne vise que les effets préjudiciables de la mesure ou de la décision actuelle du gouvernement, à l’exclusion des effets préjudiciables globaux du projet dont elle fait partie. Lorsque la ressource est transformée depuis longtemps et que la mesure ou la décision actuelle du gouvernement n’a plus aucune incidence sur elle, il n’y a pas lieu de consulter, mais de négocier une indemnisation.

Un tribunal administratif doit s’en tenir à l’exercice des pouvoirs que lui confère sa loi habilitante, et son rôle en ce qui a trait à la consultation tient à ses obligations et à ses attributions légales. Le législateur peut décider de déléguer à un tribunal administratif l’obligation de la Couronne de consulter, et il peut lui conférer le pouvoir de décider si une consultation adéquate a eu lieu.

Le pouvoir de consulter, qui est distinct du pouvoir de déterminer s’il existe une obligation de consulter, ne peut être inféré du simple pouvoir d’examiner des questions de droit. La consultation comme telle n’est pas une question de droit. Il s’agit d’un processus constitutionnel distinct, souvent complexe, et dans certaines circonstances, d’un droit mettant en jeu faits, droit, politique et compromis. Le tribunal administratif désireux d’entreprendre une consultation doit y être expressément ou tacitement autorisé, et sa loi habilitante doit lui conférer le pouvoir de réparation nécessaire.

L’obligation de consulter est une obligation constitutionnelle qui fait intervenir l’honneur de la Couronne. Elle doit être respectée. Si le régime administratif mis en place par le législateur ne peut remédier aux éventuels effets préjudiciables d’une décision sur des intérêts autochtones, les Premières nations touchées doivent alors s’adresser à une cour de justice pour obtenir la réparation voulue. L’expérience enseigne que la voie judiciaire est longue, coûteuse et souvent vaine et qu’elle ne sert l’intérêt de personne.

In this case, the Commission had the power to consider whether adequate consultation had taken place. The *Utilities Commission Act* empowered it to decide questions of law in the course of determining whether an EPA is in the public interest, which implied a power to decide constitutional issues properly before it. At the time, it also required the Commission to consider “any other factor that the commission considers relevant to the public interest”, including the adequacy of consultation. This conclusion is not altered by the *Administrative Tribunals Act*, which provides that a tribunal does not have jurisdiction over any “constitutional question”, since the application for reconsideration does not fall within the narrow statutory definition of that term.

The Legislature did not delegate the Crown’s duty to consult to the Commission. The Commission’s power to consider questions of law and matters relevant to the public interest does not empower it to engage in consultation because consultation is a distinct constitutional process, not a question of law.

The Commission correctly accepted that it had the power to consider the adequacy of consultation with Aboriginal groups, and reasonably concluded that the consultation issue could not arise because the 2007 EPA would not adversely affect any Aboriginal interest. In this case, the Crown had knowledge of a potential Aboriginal claim or right and BC Hydro’s proposal to enter into an agreement to purchase electricity from Alcan is clearly proposed Crown conduct. However, the 2007 EPA would have neither physical impacts on the Nechako River or the fishery nor organizational, policy or managerial impacts that might adversely affect the claims or rights of the First Nations. The failure to consult on the initial project was an underlying infringement, and was not sufficient to trigger a duty to consult. Charged with the duty to act in accordance with the honour of Crown, BC Hydro’s representatives will nevertheless be required to take into account and consult as necessary with affected Aboriginal groups insofar as any decisions taken in the future have the potential to adversely affect them.

#### Cases Cited

**Followed:** *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73, [2004] 3 S.C.R. 511; **referred to:** *R. v. Kapp*, 2008 SCC 41, [2008] 2 S.C.R. 483; *Taku River Tlingit First Nation v. British Columbia (Project Assessment Director)*, 2004 SCC

En l’espèce, la Commission avait le pouvoir de déterminer si une consultation adéquate avait eu lieu. La *Utilities Commission Act* l’investissait du pouvoir de trancher des questions de droit aux fins de déterminer si un CAÉ servait l’intérêt public, ce qui emportait celui de trancher une question constitutionnelle dont elle était régulièrement saisie. Au moment considéré, elle exigeait également de la Commission qu’elle tienne compte de « tout autre élément jugé pertinent eu égard à l’intérêt public », dont le caractère adéquat de la consultation. L’*Administrative Tribunals Act* ne modifie pas cette conclusion même si elle prévoit qu’un tribunal administratif n’a pas compétence à l’égard d’une « question constitutionnelle », car la demande de révision échappe à la définition restrictive de ce terme.

Le législateur n’a pas délégué à la Commission l’obligation de la Couronne de consulter. Le pouvoir de la Commission d’examiner les questions de droit et tout élément pertinent pour ce qui concerne l’intérêt public ne l’autorise pas à entreprendre la consultation, car celle-ci est un processus constitutionnel distinct, et non une question de droit.

La Commission a reconnu à juste titre avoir le pouvoir d’examiner le caractère adéquat de la consultation des groupes autochtones et elle a raisonnablement conclu que la question de la consultation ne pouvait se poser étant donné que le CAÉ de 2007 n’allait pas avoir d’effet préjudiciable sur quelque intérêt autochtone. Dans la présente affaire, la Couronne avait connaissance de l’existence possible d’une revendication autochtone ou d’un droit ancestral, et le projet de BC Hydro de conclure avec Alcan un contrat d’achat d’électricité constituait clairement une mesure projetée par la Couronne. Cependant, le CAÉ de 2007 n’allait pas avoir d’impact physique sur la rivière Nechako ou sur le poisson, ni entraîner de changements organisationnels, politiques ou de gestion susceptibles d’avoir un effet préjudiciable sur les revendications ou les droits des Premières nations. L’omission de consulter relativement au projet initial constituait une atteinte sous-jacente et ne suffisait pas pour faire naître l’obligation de consulter. Vu leur obligation d’agir conformément à l’honneur de la Couronne, les représentants de BC Hydro devront néanmoins tenir compte des groupes autochtones touchés et les consulter au besoin lorsqu’une décision ultérieure sera susceptible d’avoir un effet préjudiciable sur eux.

#### Jurisprudence

**Arrêt suivi :** *Nation Haïda c. Colombie-Britannique (Ministre des Forêts)*, 2004 CSC 73, [2004] 3 R.C.S. 511; **arrêts mentionnés :** *R. c. Kapp*, 2008 CSC 41, [2008] 2 R.C.S. 483; *Première nation Tlingit de Taku River c. Colombie-Britannique (Directeur d’évaluation*

74, [2004] 3 S.C.R. 550; *Mikisew Cree First Nation v. Canada (Minister of Canadian Heritage)*, 2005 SCC 69, [2005] 3 S.C.R. 388; *Huu-Ay-Aht First Nation v. British Columbia (Minister of Forests)*, 2005 BCSC 697, [2005] 3 C.N.L.R. 74; *Wii'litswx v. British Columbia (Minister of Forests)*, 2008 BCSC 1139, [2008] 4 C.N.L.R. 315; *Klahoose First Nation v. Sunshine Coast Forest District (District Manager)*, 2008 BCSC 1642, [2009] 1 C.N.L.R. 110; *Dene Tha' First Nation v. Canada (Minister of Environment)*, 2006 FC 1354, [2007] 1 C.N.L.R. 1, aff'd 2008 FCA 20, 35 C.E.L.R. (3d) 1; *An Inquiry into British Columbia's Electricity Transmission Infrastructure & Capacity Needs for the Next 30 Years, Re*, 2009 CarswellBC 3637; *R. v. Lefthand*, 2007 ABCA 206, 77 Alta. L.R. (4th) 203; *R. v. Douglas*, 2007 BCCA 265, 278 D.L.R. (4th) 653; *R. v. Conway*, 2010 SCC 22, [2010] 1 S.C.R. 765; *Canada (Citizenship and Immigration) v. Khosa*, 2009 SCC 12, [2009] 1 S.C.R. 339; *Paul v. British Columbia (Forest Appeals Commission)*, 2003 SCC 55, [2003] 2 S.C.R. 585; *Dunsmuir v. New Brunswick*, 2008 SCC 9, [2008] 1 S.C.R. 190.

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*Administrative Tribunals Act*, S.B.C. 2004, c. 45, ss. 1, 44(1), 58.  
*Constitution Act, 1867*, s. 91(12).  
*Constitution Act, 1982*, ss. 24, 35, 52.  
*Constitutional Question Act*, R.S.B.C. 1996, c. 68, s. 8.  
*Utilities Commission Act*, R.S.B.C. 1996, c. 473, ss. 2(4), 71, 79, 101(1), 105.

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*de projet*), 2004 CSC 74, [2004] 3 R.C.S. 550; *Première nation crie Mikisew c. Canada (Ministre du Patrimoine canadien)*, 2005 CSC 69, [2005] 3 R.C.S. 388; *Huu-Ay-Aht First Nation c. British Columbia (Minister of Forests)*, 2005 BCSC 697, [2005] 3 C.N.L.R. 74; *Wii'litswx c. British Columbia (Minister of Forests)*, 2008 BCSC 1139, [2008] 4 C.N.L.R. 315; *Klahoose First Nation c. Sunshine Coast Forest District (District Manager)*, 2008 BCSC 1642, [2009] 1 C.N.L.R. 110; *Première nation Dene Tha' c. Canada (Ministre de l'Environnement)*, 2006 CF 1354 (CanLII), conf. par 2008 CAF 20 (CanLII); *An Inquiry into British Columbia's Electricity Transmission Infrastructure & Capacity Needs for the Next 30 Years, Re*, 2009 CarswellBC 3637; *R. c. Lefthand*, 2007 ABCA 206, 77 Alta. L.R. (4th) 203; *R. c. Douglas*, 2007 BCCA 265, 278 D.L.R. (4th) 653; *R. c. Conway*, 2010 CSC 22, [2010] 1 R.C.S. 765; *Canada (Citoyenneté et Immigration) c. Khosa*, 2009 CSC 12, [2009] 1 R.C.S. 339; *Paul c. Colombie-Britannique (Forest Appeals Commission)*, 2003 CSC 55, [2003] 2 R.C.S. 585; *Dunsmuir c. Nouveau-Brunswick*, 2008 CSC 9, [2008] 1 R.C.S. 190.

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*Loi constitutionnelle de 1867*, art. 91(12).  
*Loi constitutionnelle de 1982*, art. 24, 35, 52.  
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of the British Columbia Utilities Commission approving 2007 EPA confirmed.

*Daniel A. Webster, Q.C., David W. Bursey and Ryan D. W. Dalziel*, for the appellant Rio Tinto Alcan Inc.

*Chris W. Sanderson, Q.C., Keith B. Bergner and Laura Bevan*, for the appellant the British Columbia Hydro and Power Authority.

*Gregory J. McDade, Q.C., and Maegen M. Giltrow*, for the respondent.

*Mitchell R. Taylor, Q.C.*, for the intervener the Attorney General of Canada.

*Malliha Wilson and Tamara D. Barclay*, for the intervener the Attorney General of Ontario.

*Paul E. Yearwood*, for the intervener the Attorney General of British Columbia.

*Stephanie C. Latimer*, for the intervener the Attorney General of Alberta.

Written submissions only by *Gordon A. Fulton, Q.C.*, for the intervener the British Columbia Utilities Commission.

Written submissions only by *Robert C. Freedman and Rosanne M. Kyle*, for the intervener the Mikisew Cree First Nation.

Written submissions only by *Jeffrey R. W. Rath and Nathalie Whyte*, for the intervener the Moosomin First Nation.

*Richard Spaulding*, for the intervener Nunavut Tunngavik Inc.

Written submissions only by *Timothy Howard and Bruce Stadfeld*, for the interveners the Nlaka'pamux Nation Tribal Council, the Okanagan Nation Alliance and the Upper Nicola Indian Band.

*Robert J. M. Janes*, for the intervener the Lakes Division of the Secwepemc Nation.

British Columbia Utilities Commission approuvant le CAÉ de 2007 confirmée.

*Daniel A. Webster, c.r., David W. Bursey et Ryan D. W. Dalziel*, pour l'appelante Rio Tinto Alcan Inc.

*Chris W. Sanderson, c.r., Keith B. Bergner et Laura Bevan*, pour l'appelante British Columbia Hydro and Power Authority.

*Gregory J. McDade, c.r., et Maegen M. Giltrow*, pour l'intimé.

*Mitchell R. Taylor, c.r.*, pour l'intervenant le procureur général du Canada.

*Malliha Wilson et Tamara D. Barclay*, pour l'intervenant le procureur général de l'Ontario.

*Paul E. Yearwood*, pour l'intervenant le procureur général de la Colombie-Britannique.

*Stephanie C. Latimer*, pour l'intervenant le procureur général de l'Alberta.

Argumentation écrite seulement par *Gordon A. Fulton, c.r.*, pour l'intervenante British Columbia Utilities Commission.

Argumentation écrite seulement par *Robert C. Freedman et Rosanne M. Kyle*, pour l'intervenante la Première nation crie Mikisew.

Argumentation écrite seulement par *Jeffrey R. W. Rath et Nathalie Whyte*, pour l'intervenante la Première nation de Moosomin.

*Richard Spaulding*, pour l'intervenante Nunavut Tunngavik Inc.

Argumentation écrite seulement par *Timothy Howard et Bruce Stadfeld*, pour les intervenants le Conseil tribal de la nation Nlaka'pamux, l'Alliance des nations de l'Okanagan et la Bande indienne d'Upper Nicola.

*Robert J. M. Janes*, pour l'intervenante la Division des Grands lacs de la nation Secwepemc.

*Peter W. Hutchins and David Kalmakoff*, for the interveners the Assembly of First Nations.

Written submissions only by *Mervin C. Phillips*, for the interveners the Standing Buffalo Dakota First Nation.

*Arthur C. Pape and Richard B. Salter*, for the interveners the First Nations Summit.

*Jay Nelson*, for the interveners the Duncan's First Nation and the Horse Lake First Nation.

*Roy W. Millen*, for the interveners the Independent Power Producers Association of British Columbia.

Written submissions only by *Harry C. G. Underwood*, for the interveners Enbridge Pipelines Inc.

Written submissions only by *C. Kemm Yates, Q.C.*, for the interveners the TransCanada Keystone Pipeline GP Ltd.

The judgment of the Court was delivered by

*Peter W. Hutchins et David Kalmakoff*, pour l'intervenante l'Assemblée des Premières Nations.

Argumentation écrite seulement par *Mervin C. Phillips*, pour l'intervenante la Première nation Standing Buffalo Dakota.

*Arthur C. Pape et Richard B. Salter*, pour l'intervenant le Sommet des Premières nations.

*Jay Nelson*, pour les intervenantes la Première nation Duncan's et la Première nation de Horse Lake.

*Roy W. Millen*, pour l'intervenante Independent Power Producers Association of British Columbia.

Argumentation écrite seulement par *Harry C. G. Underwood*, pour l'intervenante Enbridge Pipelines Inc.

Argumentation écrite seulement par *C. Kemm Yates, c.r.*, pour l'intervenante TransCanada Keystone Pipeline GP Ltd.

Version française du jugement de la Cour rendu par

[1] THE CHIEF JUSTICE — In the 1950s, the government of British Columbia authorized the building of the Kenney Dam in Northwest British Columbia for the production of hydro power for the smelting of aluminum. The dam and reservoir altered the water flows to the Nechako River, which the Carrier Sekani Tribal Council (“CSTC”) First Nations have since time immemorial used for fishing and sustenance. This was done without consulting with the CSTC First Nations. Now, the government of British Columbia seeks approval of a contract for the sale of excess power from the dam to British Columbia Hydro and Power Authority (“BC Hydro”), a Crown corporation. The question is whether the British Columbia Utilities Commission (the “Commission”) is required to consider the issue of consultation with the CSTC First Nations in determining whether the sale is in the public interest.

[1] LA JUGE EN CHEF — Dans les années 1950, le gouvernement de la Colombie-Britannique a autorisé la construction du barrage Kenney dans le nord-ouest de la province en vue de la production d'électricité destinée à l'alimentation d'une aluminerie. Le barrage et le réservoir ont modifié les débits d'eau dans la rivière Nechako, dont les Premières nations du Conseil tribal Carrier Sekani (« CTCS ») tirent leur subsistance (notamment grâce à la pêche) depuis des temps immémoriaux. Ces Premières nations n'ont pas été consultées avant la construction du complexe. Le gouvernement de la Colombie-Britannique demande aujourd'hui l'approbation d'un contrat de vente des surplus d'électricité produits par le barrage à une société d'État, British Columbia Hydro and Power Authority (« BC Hydro »). La Cour doit déterminer si la British Columbia Utilities Commission (la « Commission ») est tenue de se pencher sur la question de la consultation des Premières nations du CTCS pour déterminer si la vente sert l'intérêt public.

[2] In *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73, [2004] 3 S.C.R. 511, this Court affirmed that governments have a duty to consult with Aboriginal groups when making decisions which may adversely impact lands and resources to which Aboriginal peoples lay claim. In the intervening years, government-Aboriginal consultation has become an important part of the resource development process in British Columbia especially; much of the land and resources there are subject to land claims negotiations. This case raises the issues of what triggers a duty to consult, and the place of government tribunals in consultation and the review of consultation. I would allow the appeal, while affirming the duty of BC Hydro to consult the CSTC First Nations on future developments that may adversely affect their claims and rights.

## I. Background

### A. *The Facts*

[3] In the 1950s, Alcan (now Rio Tinto Alcan) dammed the Nechako River in northwestern British Columbia for the purposes of power development in connection with aluminum production. The project was one of huge magnitude. It diverted water from the Nechako River into the Nechako Reservoir, where a powerhouse was installed for the production of electricity. After passing through the turbines of the powerhouse, the water flowed to the Kemano River and on to the Pacific Ocean to the west. The dam affected the amount and timing of water flows into the Nechako River to the east, impacting fisheries on lands now claimed by the CSTC First Nations. Alcan effected these water diversions under Final Water Licence No. 102324 which gives Alcan use of the water on a permanent basis.

[4] Alcan, the Province of British Columbia, and Canada entered into a Settlement Agreement in

[2] Dans l'arrêt *Nation Haïda c. Colombie-Britannique (Ministre des Forêts)*, 2004 CSC 73, [2004] 3 R.C.S. 511, la Cour affirme qu'un gouvernement a l'obligation de consulter les peuples autochtones avant de prendre des décisions susceptibles d'avoir un effet préjudiciable sur les terres et les ressources revendiquées par eux. Depuis lors, la consultation des Autochtones par le gouvernement constitue un volet important du processus d'exploitation des ressources, spécialement en Colombie-Britannique où beaucoup de terres et de ressources font l'objet de revendications territoriales. Le pourvoi soulève les questions suivantes : d'où naît l'obligation de consulter et quel rôle joue un tribunal administratif dans la consultation et le contrôle de celle-ci? Je suis d'avis d'accueillir le pourvoi, tout en confirmant l'obligation de BC Hydro de consulter les Premières nations du CTCS sur les activités d'exploitation ultérieures susceptibles d'avoir un effet préjudiciable sur leurs revendications et leurs droits.

## I. Contexte

### A. *Les faits*

[3] Dans les années 1950, Alcan (aujourd'hui Rio Tinto Alcan) a construit un barrage sur la rivière Nechako dans le nord-ouest de la Colombie-Britannique afin de produire de l'électricité destinée à la fabrication d'aluminium. Il s'agissait de travaux colossaux. L'eau de la rivière Nechako a été détournée dans le réservoir du même nom, où une centrale a été construite pour y produire de l'électricité. Après être passée dans les turbines de la centrale, l'eau se déversait ensuite dans la rivière Kemano, puis dans l'océan Pacifique à l'ouest. Le barrage a eu une incidence sur le débit de la rivière Nechako à l'est, ce qui a eu des répercussions sur les stocks de poissons dans les terres aujourd'hui revendiquées par les Premières nations du CTCS. Alcan a effectué ces dérivations d'eau conformément au permis d'exploitation hydraulique permanent n° 102324, qui lui accorde un droit perpétuel d'utilisation de l'eau.

[4] En 1987, Alcan, la province de la Colombie-Britannique et le Canada ont convenu de lâchers

1987 on the release of waters in order to protect fish stocks. Canada was involved because fisheries, whether seacoast-based or inland, fall within federal jurisdiction under s. 91(12) of the *Constitution Act, 1867*. The 1987 agreement directs the release of additional flows in July and August to protect migrating salmon. In addition, a protocol has been entered into between the Haisla Nation and Alcan which regulates water flows to protect eulachon spawning grounds.

[5] The electricity generated by the project has been used over the years primarily for aluminum smelting. Since 1961, however, Alcan has sold its excess power to BC Hydro, a Crown Corporation, for use in the local area and later for transmission to neighbouring communities. The Energy Purchase Agreement (“EPA”) entered into in 2007, which is the subject of this appeal is the latest in a series of power sales from Alcan to BC Hydro. It commits Alcan to supplying and BC Hydro to purchasing excess electricity from the Kemano site until 2034. The 2007 EPA establishes a Joint Operating Committee to advise the parties on the administration of the EPA and the operation of the reservoir.

[6] The CSTC First Nations claim the Nechako Valley as their ancestral homeland, and the right to fish in the Nechako River. As was the practice at the time, they were not consulted about the diversion of the river effected by the 1950s dam project. They assert, however, that the 2007 EPA for the power generated by the project should be subject to consultation. This, they say, is their constitutional right under s. 35 of the *Constitution Act, 1982*, as defined in *Haida Nation*.

#### B. *The Commission Proceedings*

[7] The 2007 EPA was subject to review before the Commission. It was charged with determining whether the sale of electricity was in the public interest under s. 71 of the *Utilities Commission*

d’eau pour protéger les stocks de poissons. Le Canada était partie à l’accord, car les pêches, des côtes de la mer ou de l’intérieur, relèvent de la compétence fédérale suivant le par. 91(12) de la *Loi constitutionnelle de 1867*. L’accord de 1987 prévoit des lâchers supplémentaires en juillet et en août afin de protéger le saumon anadrome. De plus, un protocole est intervenu entre la nation Haisla et Alcan pour régulariser les débits d’eau et protéger les frayères d’eulachons.

[5] Au fil des ans, l’électricité générée par la centrale a principalement servi à alimenter une aluminerie. Toutefois, depuis 1961, Alcan vend ses surplus d’électricité à une société d’État, BC Hydro. Ces surplus ont d’abord été consommés localement, puis acheminés vers des collectivités avoisinantes. Le contrat d’achat d’électricité (le « CAÉ ») conclu en 2007, qui fait l’objet du pourvoi, est le plus récent intervenu entre Alcan et BC Hydro. Alcan s’y engage à vendre l’électricité excédentaire produite par la centrale de Kemano, et BC Hydro à l’acheter, jusqu’en 2034. Le CAÉ de 2007 crée un comité conjoint d’exploitation appelé à conseiller les parties sur l’administration du contrat et l’exploitation du réservoir.

[6] Les Premières nations du CTCS prétendent que la vallée de la Nechako fait partie de leurs terres ancestrales et elles revendiquent le droit de pêcher dans la rivière Nechako. Comme ce n’était pas l’usage à l’époque, elles n’ont pas été consultées au sujet du détournement de la rivière occasionné par la construction du barrage dans les années 1950. Elles font toutefois valoir que le CAÉ de 2007 conclu relativement à l’énergie produite par ce barrage devrait faire l’objet d’une consultation. Selon elles, il s’agit d’un droit constitutionnel découlant de l’art. 35 de la *Loi constitutionnelle de 1982*, au sens où l’entend la Cour dans l’arrêt *Nation Haïda*.

#### B. *Les procédures de la Commission*

[7] Le CAÉ de 2007 a été soumis à l’examen de la Commission, laquelle devait, en application de l’art. 71 de la *Utilities Commission Act*, R.S.B.C. 1996, ch. 473, déterminer si la vente d’électricité

*Act*, R.S.B.C. 1996, c. 473. The Commission had the power to declare a contract for the sale of electricity unenforceable if it found that it was not in the public interest having regard to the quantity of energy to be supplied, the availability of supplies, the price and availability of any other form of energy, the price of the energy supplied to a public utility company, and “any other factor that the commission considers relevant to the public interest”.

[8] The Commission began its work by holding two procedural conferences to determine, among other things, the “scope” of its hearing. “Scoping” is the process by which the Commission determines what “information it considers necessary to determine whether the contract is in the public interest” pursuant to s. 71(1)(b) of the *Utilities Commission Act*. The question of the role of First Nations in the proceedings arose at this stage. The CSTC was not party to the proceedings but the Haisla Nation was. The Haisla people submitted that the Province and BC Hydro “ha[d] failed to act on their legal obligation” to them, but refrained from asking the Commission “to assess the adequacy [of consultation] and accommodation afforded . . . on the 2007 EPA”: *Re: British Columbia Hydro & Power Authority Filing of Electricity Purchase Agreement with Alcan Inc. as an Energy Supply Contract Pursuant to Section 71*, British Columbia Utilities Commission, October 10, 2007 (the “Scoping Order”), unreported. The Commission’s Scoping Order therefore addressed the consultation issue as follows:

Evidence relevant to First Nations consultation may be relevant for the same purpose that the Commission often considers evidence of consultation with other stakeholders. Generally, insufficient evidence of consultation, including with First Nations is not determinative of matters before the Commission.

[9] On October 29, 2007, the CSTC requested late intervenor status on the issue of consultation on the basis that the Commission’s decision

était dans l’intérêt public. La Commission avait le pouvoir de déclarer inapplicable le contrat de vente d’électricité qui, selon elle, n’était pas dans l’intérêt public compte tenu de la quantité d’énergie fournie, de la disponibilité de l’approvisionnement, du prix et de la disponibilité de toute autre forme d’énergie, du prix de l’énergie fournie à une entreprise de services publics et de [TRADUCTION] « tout autre élément jugé pertinent eu égard à l’intérêt public ».

[8] La Commission a entrepris ses travaux par la tenue de deux conférences de nature procédurale pour déterminer notamment le « cadre » de l’audience. Le « cadrage » est le processus par lequel la Commission détermine [TRADUCTION] « les données qu’elle estime nécessaires pour décider si le contrat est ou non dans l’intérêt public » en application de l’al. 71(1)b) de la *Utilities Commission Act*. C’est à cette étape qu’a été soulevée la question de la participation des Premières nations à l’audience. Le CTCS n’était pas partie à la procédure, contrairement à la Nation Haisla, qui soutenait que la province et BC Hydro [TRADUCTION] « avaient manqué à leur obligation légale envers elle », mais qui ne demandait pas à la Commission « de se prononcer sur le caractère adéquat [de la consultation] et des mesures d’accommodement prises [. . .] relativement au CAÉ de 2007 » : *Re : British Columbia Hydro & Power Authority Filing of Electricity Purchase Agreement with Alcan Inc. as an Energy Supply Contract Pursuant to Section 71*, British Columbia Utilities Commission, 10 octobre 2007 (l’« ordonnance sur le cadre de l’audience »), inédite. Dans son ordonnance, la Commission se prononce donc comme suit sur la question de la consultation :

[TRADUCTION] Les éléments de preuve se rapportant à la consultation des Premières nations peuvent être pertinents, et ce, pour les mêmes raisons que la Commission examine souvent la preuve de la consultation d’autres intéressés. De manière générale, une preuve de consultation insuffisante, notamment des Premières nations, n’est pas déterminante eu égard aux questions dont est saisie la Commission.

[9] Le 29 octobre 2007, le CTCS a tardivement demandé d’être constitué partie intervenante sur la question de la consultation au motif que la décision

might negatively impact Aboriginal rights and title which were the subject of its ongoing land claims. At the opening of the oral hearing on November 19, 2007, the CSTC applied for reconsideration of the Scoping Order and, in written submissions of November 20, 2007, it asked the Commission to include in the hearing's scope the issues of whether the duty to consult had been met, whether the proposed power sale under the 2007 EPA could constitute an infringement of Aboriginal rights and title in and of itself, and the related issue of the environmental impact of the 2007 EPA on the rights of the CSTC First Nations.

[10] The Commission established a two-stage process to consider the CSTC's application for reconsideration of the Scoping Order: an initial screening phase to determine whether there was a reasonable evidentiary basis for reconsideration, and a second phase to receive arguments on whether the rescoping application should be granted. At the first stage, the CSTC filed evidence, called witnesses and cross-examined the witnesses of BC Hydro and Alcan. The Commission confined the proceedings to the question of whether the 2007 EPA would adversely affect potential CSTC First Nations' interests by causing changes in water flows into the Nechako River or changes in water levels of the Nechako Reservoir.

[11] On November 29, 2007, the Commission issued a preliminary decision on the Phase I process called "Impacts on Water Flows". It concluded that the "responsibility for operation of the Nechako Reservoir remains with Alcan under the 2007 EPA", and that the EPA would not affect water levels in the Nechako River stating, "the 2007 EPA sets the priority of generation produced but does not set the priority for water". With or without the 2007 EPA, "Alcan operates the Nechako Reservoir to optimize power generation".

[12] As to fisheries, the Commission stated that "the priority of releases from the Nechako Reservoir [under the 1987 Settlement Agreement]

de la Commission risquait d'avoir un effet préjudiciable sur les droits ancestraux et le titre aborigène qu'il revendiquait alors. Le 19 novembre 2007, au début de l'audience, le CTCS a demandé la révision de l'ordonnance qui en définissait le cadre et, dans son argumentation écrite du 20 novembre 2007, il a demandé qu'à l'audience, la Commission examine en outre les questions de savoir si l'obligation de consultation avait été respectée et si la vente d'électricité projetée dans le CAÉ de 2007 pouvait en soi être préjudiciable aux droits ancestraux et au titre aborigène, ainsi que la question connexe des répercussions environnementales du CAÉ de 2007 sur les droits des Premières nations du CTCS.

[10] La Commission a établi un processus comportant deux étapes pour statuer sur la demande de révision. Elle devait d'abord déterminer si un fondement probatoire raisonnable justifiait la révision de l'ordonnance, puis entendre les arguments des parties sur la question de savoir s'il y avait lieu d'accueillir la demande de recadrage. À la première étape, le CTCS a produit des éléments de preuve, présenté des témoins et contre-interrogé ceux de BC Hydro et d'Alcan. La Commission s'en est tenue à la question de savoir si, en raison de la modification du débit de la rivière Nechako ou du niveau du réservoir Nechako qui en résulterait, le CAÉ de 2007 aurait un effet préjudiciable sur les droits éventuels des Premières nations du CTCS.

[11] Le 29 novembre 2007, la Commission a rendu à la première étape une décision préliminaire intitulée [TRADUCTION] « Impact sur le débit d'eau ». Elle y conclut que [TRADUCTION] « suivant le CAÉ de 2007, l'exploitation du réservoir Nechako continue d'incomber à Alcan » et que le contrat ne changera rien aux niveaux de la rivière Nechako, affirmant que [TRADUCTION] « le CAÉ de 2007 accorde la priorité à la production d'électricité, et non à l'eau ». Avec ou sans le CAÉ de 2007, [TRADUCTION] « Alcan exploite le réservoir Nechako dans le but d'optimiser la production d'électricité ».

[12] Au chapitre de la pêche, la Commission a estimé que [TRADUCTION] « les lâchers d'eau effectués à partir du réservoir Nechako [conformément

is first to fish flows and second to power service”. While the timing of water releases from the Nechako Reservoir for power generation purposes may change as a result of the 2007 EPA, that change “will have no impact on the releases into the Nechako river system”. This is because water releases for power generation flow not into the Nechako River system to the east, with which the CSTC First Nations are concerned, but into the Kemano River to the west. Nor, the Commission found, would the 2007 EPA bring about a change in control over water flows and water levels, or alter the management structure of the reservoir.

[13] The Commission then embarked on Phase II of the rescoping hearing and invited the parties to make written submissions on the reconsideration application — specifically, on whether it would be a jurisdictional error not to revise the Scoping Order to encompass consultation issues on these facts. The parties did so.

[14] On December 17, 2007, the Commission dismissed the CSTC’s application for reconsideration of the scoping order on grounds that the 2007 EPA would not introduce new adverse effects to the interests of the First Nations: *Re British Columbia Hydro & Power Authority*, 2008 CarswellBC 1232 (B.C.U.C.) (the “Reconsideration Decision”). For the purposes of the motion, the Commission assumed the historic infringement of Aboriginal rights, Aboriginal title, and a failure by the government to consult. Referring to *Haida Nation*, it concluded that “more than just an underlying infringement” was required. The CSTC had to demonstrate that the 2007 EPA would “adversely affect” the Aboriginal interests of its member First Nations. Applying this test to its findings of fact, it stated that “a section 71 review does not approve, transfer or change control of licenses or authorization and therefore where there are no new physical impacts acceptance of a section 71 filing [without consultation] would not be a jurisdictional error”. The Commission therefore concluded that its decision on the 2007 EPA would have no adverse effects on the CSTC First Nations’ interests. The duty to consult was therefore not triggered, and no jurisdictional

à l’accord de 1987] visent en priorité le passage des poissons, puis la production d’électricité ». Bien que le calendrier des lâchers d’eau destinés à la production d’électricité puisse changer en raison du CAÉ de 2007, à son avis, cela [TRADUCTION] « n’aura aucun impact sur les apports dans le réseau hydrographique de la Nechako », car ces lâchers d’eau ne sont pas effectués dans la rivière Nechako à l’est — objet de la préoccupation des Premières nations du CTCS —, mais dans la rivière Kemano à l’ouest. La Commission a aussi conclu que le CAÉ de 2007 ne modifiera ni la gestion des débits et des niveaux d’eau, ni la structure de gestion du réservoir.

[13] À la deuxième étape, la Commission a invité les parties à présenter des observations écrites sur la demande de révision — plus précisément, sur la question de savoir si le refus de recadrer l’audience pour que les questions liées à la consultation y soient aussi abordées constituerait une erreur de compétence à la lumière de ces faits. Les parties ont répondu à l’invitation.

[14] Le 17 décembre 2007, la Commission a rejeté la demande du CTCS au motif que le CAÉ de 2007 ne créerait pas de nouveaux effets défavorables sur les intérêts des Premières nations en cause : *Re British Columbia Hydro & Power Authority*, 2008 CarswellBC 1232 (B.C.U.C.) (la « décision sur la demande de révision »). Pour statuer, elle a tenu pour avérés l’atteinte historique aux droits ancestraux et au titre aborigène et le manquement du gouvernement à son obligation de consulter. S’appuyant sur l’arrêt *Nation Haïda*, elle a conclu qu’il fallait [TRADUCTION] « davantage qu’une atteinte sous-jacente ». Le CTCS devait démontrer que le CAÉ de 2007 aurait un « effet préjudiciable » sur les droits ancestraux des Premières nations qui en faisaient partie. Après avoir appliqué ce critère à ses conclusions de fait, elle a statué que l’[TRADUCTION] « examen visé à l’article 71 n’a pas pour effet d’approuver ou de transférer une licence ou une autorisation ou d’en modifier le titulaire, de sorte qu’en l’absence de nouveaux impacts physiques, faire droit [sans consultation] à une demande présentée sous le régime de l’article 71 ne constituerait pas une erreur de compétence ». La Commission a donc estimé que sa décision

error was committed in failing to include consultation with the First Nations in the Scoping Order beyond the general consultation extended to all stakeholders.

[15] The Commission went on to conclude that the 2007 EPA was in the public interest and should be accepted. It stated:

In the circumstances of this review, evidence regarding consultation with respect to the historical, continuing infringement can reasonably be expected to be of no assistance for the same reasons there is no jurisdictional error, that is, the limited scope of the section 71 review, and there are no new physical impacts.

[16] In essence, the Commission took the view that the 2007 EPA would have no physical impact on the existing water levels in the Nechako River and hence it would not change the current management of its fishery. The Commission further found that its decision would not involve any transfer or change in the project's licences or operations. Consequently, the Commission concluded that its decision would have no adverse impact on the pending claims or rights of the CSTC First Nations such that there was no need to rescope the hearing to permit further argument on the duty to consult.

C. *The Judgment of the Court of Appeal, 2009 BCCA 67, 89 B.C.L.R. (4th) 298 (Donald, Huddart and Bauman J.J.A.)*

[17] The CSTC appealed the Reconsideration Decision and the approval of the 2007 EPA to the British Columbia Court of Appeal. The Court, *per* Donald J.A., reversed the Commission's orders and remitted the case back to the Commission for "evidence and argument on whether a duty to consult and, if necessary, accommodate the [CSTC First Nations] exists and, if so, whether the duty has been met in respect of the filing of the 2007 EPA" (para. 69).

concernant le CAÉ de 2007 n'aurait pas d'effet préjudiciable sur les intérêts des Premières nations du CTCS. L'obligation de consulter n'avait donc pas pris naissance, et la Commission n'a pas commis d'erreur de compétence en refusant d'inclure dans le cadre de l'audience la consultation des Premières nations, en sus de la consultation générale de tous les intéressés.

[15] La Commission a ensuite conclu que le CAÉ de 2007 était dans l'intérêt public et devait être approuvé :

[TRADUCTION] Dans les circonstances du présent examen, on peut raisonnablement tenir pour inutile la preuve relative à la consultation sur l'atteinte historique et continue pour les mêmes raisons qu'il n'y a pas d'erreur de compétence, soit la portée limitée de l'examen visé à l'article 71 et l'absence de nouveaux impacts physiques.

[16] Essentiellement, la Commission a opiné que le CAÉ de 2007 n'aurait pas d'impact physique sur les niveaux d'eau existants de la rivière Nechako, de sorte qu'il ne modifierait pas la gestion des stocks de poissons. Elle a aussi estimé que sa décision ne nécessiterait ni cession ni modification des licences ou des activités d'exploitation. Elle est donc arrivée à la conclusion que sa décision n'aurait aucun effet préjudiciable sur les revendications ou les droits des Premières nations du CTCS, de sorte qu'il n'était pas nécessaire de recadrer l'audience pour permettre que soit débattue plus avant la question de l'obligation de consulter.

C. *Le jugement de la Cour d'appel, 2009 BCCA 67, 89 B.C.L.R. (4th) 298 (les juges Donald, Huddart et Bauman)*

[17] Le CTCS a contesté devant la Cour d'appel de la Colombie-Britannique la décision sur la demande de révision et l'approbation du CAÉ de 2007. Au nom de la Cour d'appel, le juge Donald a annulé les ordonnances et renvoyé l'affaire à la Commission pour qu'elle entende [TRADUCTION] « preuve et arguments sur la question de savoir s'il existe ou non une obligation de consulter [les Premières nations du CTCS] et, au besoin, d'arriver à un accord avec elles et, dans l'affirmative, sur la question de savoir si l'obligation a été respectée relativement au dépôt du CAÉ de 2007 » (par. 69).



[18] The Court of Appeal found that the Commission had jurisdiction to consider the issue of consultation. The Commission had the power to decide questions of law, and hence constitutional issues relating to the duty to consult.

[19] The Court of Appeal went on to hold that the Commission acted prematurely by rejecting the application for reconsideration. Donald J.A., writing for the Court, stated:

... the Commission wrongly decided something as a preliminary matter which properly belonged in a hearing of the merits. The logic flaw was in predicting that consultation could have produced no useful outcome. Put another way, the Commission required a demonstration that the [CSTC] would win the point as a precondition for a hearing into the very same point.

I do not say that the Commission would be bound to find a duty to consult here. The fault in the Commission's decision is in not entertaining the issue of consultation within the scope of a full hearing when the circumstances demanded an inquiry. [paras. 61-62]

[20] The Court of Appeal held that the honour of the Crown obliged the Commission to decide the consultation issue, and that "the tribunal with the power to approve the plan must accept the responsibility to assess the adequacy of consultation" (para. 53). Unlike the Commission, the Court of Appeal did not consider whether the 2007 EPA was capable of having an adverse impact on a pending claim or right of the CSTC First Nations. The Court of Appeal did not criticize the Commission's adverse impacts finding. Rather, it appears to have concluded that despite these findings, the Commission was obliged to consider whether consultation could be "useful". In finding that the Commission should have considered the consultation issue, the Court of Appeal appears to have taken a broader view than did the Commission as to when a duty to consult may arise.

[21] The Court of Appeal suggested that a failure to consider consultation risked the approval of a contract in breach of the Crown's constitutional

[18] La Cour d'appel conclut que la Commission avait compétence pour se pencher sur la question de la consultation. La Commission pouvait trancher des questions de droit et, par conséquent, toute question constitutionnelle liée à l'obligation de consulter.

[19] La Cour d'appel opine ensuite que la Commission a prématurément rejeté la demande de révision. Le juge Donald dit ce qui suit au nom de la juridiction d'appel :

[TRADUCTION] ... la Commission a tranché une question tenue erronément pour préliminaire alors qu'il s'agissait d'une question de fond. La faille logique a consisté à présumer l'inutilité de la consultation. Autrement dit, la Commission a exigé comme condition préalable à l'examen des prétentions que [le CTCS] en démontre d'abord la justesse.

Je ne dis pas que la Commission serait tenue de conclure à l'existence d'une obligation de consulter en l'espèce. L'erreur de la Commission est de ne pas avoir considéré la question de la consultation dans le cadre d'une audience en bonne et due forme alors que les circonstances exigeaient un examen. [par. 61-62]

[20] La Cour d'appel conclut que l'honneur de la Couronne obligeait la Commission à trancher la question de la consultation et que [TRADUCTION] « le tribunal administratif doté du pouvoir d'approuver le projet doit accepter l'obligation de se prononcer sur le caractère adéquat de la consultation » (par. 53). Contrairement à la Commission, la Cour d'appel ne se demande pas si le CAÉ de 2007 était susceptible d'avoir un effet préjudiciable sur quelque revendication ou droit des Premières nations du CTCS. Elle ne reproche pas à la Commission sa conclusion sur l'effet préjudiciable. Elle semble plutôt estimer que, malgré cette conclusion, la Commission était tenue de déterminer si la consultation pouvait être « utile ». En statuant que la Commission aurait dû examiner la question de la consultation, la Cour d'appel paraît interpréter plus largement que la Commission les conditions auxquelles il y a obligation de consulter.

[21] La Cour d'appel laisse entendre que l'omission de considérer la question de la consultation risquait d'entraîner l'approbation d'un contrat

duty. Donald J.A. asked, “How can a contract formed by a Crown agent in breach of a constitutional duty be in the public interest? The existence of such a duty and the allegation of the breach must form part and parcel of the public interest inquiry” (para. 42).

[22] Alcan and BC Hydro appeal to this Court. They argue that the Court of Appeal took too wide a view of the Crown’s duty to consult and of the role of tribunals in deciding consultation issues. In view of the Commission’s task under its constituent statute and the evidence before it, Alcan and BC Hydro submit that the Commission correctly concluded that it had no duty to consider the consultation issue raised by the CSTC, since, however much participation was accorded, there was no possibility of finding a duty to consult with respect to the 2007 EPA.

[23] The CSTC argues that the Court of Appeal correctly held that the Commission erred in refusing to rescope its proceeding to allow submissions on the consultation issue. It does not pursue earlier procedural arguments in this Court.

## II. The Legislative Framework

### A. *Legislation Regarding the Public Interest Determination*

[24] The 2007 EPA was subject to review before the Commission under the authority of s. 71 of the *Utilities Commission Act* to determine whether it was in the public interest. Prior to May 2008, this determination was to be based on the quantity of energy to be supplied; the availability of supplies; the price and availability of any other form of energy; the price of the energy supplied to a public utility company; and “any other factor that the commission considers relevant to the public interest”:

au mépris de l’obligation constitutionnelle de la Couronne. Le juge Donald pose la question suivante : [TRADUCTION] « Comment un contrat conclu par un mandataire de la Couronne dans le non-respect d’une obligation constitutionnelle peut-il être dans l’intérêt public? L’existence d’une telle obligation et l’allégation de non-respect doivent faire partie intégrante de l’examen relatif à l’intérêt public » (par. 42).

[22] Alcan et BC Hydro interjettent appel devant notre Cour. Elles soutiennent que la Cour d’appel a interprété trop largement l’obligation de la Couronne de consulter et le pouvoir du tribunal administratif de trancher les questions touchant à la consultation. Vu le mandat incombant à la Commission suivant sa loi constitutive et la preuve dont elle disposait, Alcan et BC Hydro prétendent que la Commission a conclu à juste titre qu’elle n’était pas tenue d’examiner la question de la consultation soulevée par le CTCS, car peu importe l’importance du droit de participation reconnu, il était impossible de conclure à l’existence d’une obligation de consulter relativement au CAÉ de 2007.

[23] Le CTCS avance que la Cour d’appel a eu raison de conclure que la Commission avait refusé à tort de redéfinir le cadre de l’audience de manière à permettre la présentation d’observations sur la question de la consultation. Il ne fait plus valoir les arguments procéduraux invoqués devant les tribunaux inférieurs.

## II. Le cadre législatif

### A. *Dispositions législatives régissant la décision relative à l’intérêt public*

[24] L’article 71 de la *Utilities Commission Act* prévoyait que la Commission devait examiner le CAÉ de 2007 pour déterminer si son approbation était dans l’intérêt public. Avant le mois de mai 2008, la décision devait tenir compte de la quantité d’énergie fournie, de la disponibilité de l’approvisionnement, du prix et de la disponibilité de toute autre forme d’énergie, du prix de l’énergie fournie à une entreprise de services publics et de [TRADUCTION] « tout autre élément jugé pertinent

*Utilities Commission Act*, s. 71(2)(a) to (e). Effective May 2008, these considerations were expanded to include “the government’s energy objectives” and its long-term resource plans: s. 71(2.1)(a) and (b). The public interest clause, however, was narrowed to considerations of the interests of potential British Columbia public utility customers: s. 71(2.1)(d).

*B. Legislation on the Commission’s Remedial Powers*

[25] Based on the above considerations, the Commission may issue an order approving the proposed contract under s. 71(2.4) of the *Utilities Commission Act* if it is found to be in the public interest. If it is not found to be in the public interest, the Commission can issue an order declaring the contract unenforceable, either wholly or in part, or “make any other order it considers advisable in the circumstances”: s. 71(2) and (3).

*C. Legislation on the Commission’s Jurisdiction and Appeals*

[26] Section 79 of the *Utilities Commission Act* states that all findings of fact made by the Commission within its jurisdiction are “binding and conclusive”. This is supplemented by s. 105 which grants the Commission “exclusive jurisdiction in all cases and for all matters in which jurisdiction is conferred on it by this or any other Act”. An appeal, however, lies from a decision or order of the Commission to the Court of Appeal with leave: s. 101(1).

[27] Together, ss. 79 and 105 of the *Utilities Commission Act* constitute a “privative clause” as defined in s. 1 of the *British Columbia Administrative Tribunals Act*, S.B.C. 2004, c. 45. Under s. 58 of the *Administrative Tribunals Act*, this privative clause attracts a “patently unreasonable” standard of judicial review to “a finding of fact or law or

eu égard à l’intérêt public » : al. 71(2)a) à e) de la *Utilities Commission Act*. À compter de mai 2008, se sont ajoutées les considérations suivantes : les [TRADUCTION] « objectifs énergétiques du gouvernement » et son plan à long terme en matière de ressources : al. 71(2.1)a) et b). Or, la disposition portant sur l’intérêt public a vu sa portée ramenée à la prise en compte des intérêts des clients éventuels d’une entreprise de services publics de la Colombie-Britannique : al. 71(2.1)d).

*B. Dispositions législatives régissant le pouvoir de réparation de la Commission*

[25] Au vu des considérations susmentionnées, la Commission peut, si elle juge qu’il est dans l’intérêt public de le faire, rendre une ordonnance approuvant le contrat projeté en application du par. 71(2.4) de la *Utilities Commission Act*. Si elle arrive à la conclusion contraire concernant l’intérêt public, elle peut, par voie d’ordonnance, déclarer le contrat inapplicable, en totalité ou en partie, ou [TRADUCTION] « rendre toute autre ordonnance qu’elle juge indiquée dans les circonstances » : par. 71(2) et (3).

*C. Dispositions législatives régissant la compétence de la Commission et le droit d’appel*

[26] L’article 79 de la *Utilities Commission Act* dispose que les conclusions de fait tirées par la Commission dans les limites de sa compétence sont [TRADUCTION] « opposables et définitives ». L’article 105 confère en outre à la Commission le [TRADUCTION] « pouvoir exclusif de statuer dans toute affaire et sur toute question relevant de sa compétence suivant la présente loi ou un autre texte législatif ». Ses décisions et ordonnances peuvent cependant être contestées devant la Cour d’appel, sur autorisation : par. 101(1).

[27] Ensemble, les art. 79 et 105 de la *Utilities Commission Act* constituent une [TRADUCTION] « disposition d’inattaquabilité » au sens de l’article premier de l’*Administrative Tribunals Act* de la Colombie-Britannique, S.B.C. 2004, ch. 45. Suivant l’art. 58 de l’*Administrative Tribunals Act*, cette disposition d’inattaquabilité assujettit à la norme de

an exercise of discretion by the tribunal in respect of a matter over which it has exclusive jurisdiction under a privative clause”; a standard of correctness is to be applied in the review of “all [other] matters”.

[28] The jurisdiction of the commission is also arguably affected by s. 44(1) of the *Administrative Tribunals Act* which applies to the Commission by virtue of s. 2(4) of the *Utilities Commission Act*. Section 44(1) of the *Administrative Tribunals Act* states that “[t]he tribunal does not have jurisdiction over constitutional questions”. A “constitutional question” is defined in s. 1 of the *Administrative Tribunals Act* by s. 8 of the *Constitutional Question Act*, R.S.B.C. 1996, c. 68. Section 8(2) says:

8. . . .

(2) If in a cause, matter or other proceeding

- (a) the constitutional validity or constitutional applicability of any law is challenged, or
- (b) an application is made for a constitutional remedy,

the law must not be held to be invalid or inapplicable and the remedy must not be granted until after notice of the challenge or application has been served on the Attorney General of Canada and the Attorney General of British Columbia in accordance with this section.

A “constitutional remedy” is defined as “a remedy under section 24(1) of the *Canadian Charter of Rights and Freedoms* other than a remedy consisting of the exclusion of evidence or consequential on such exclusion”: *Constitutional Question Act*, s. 8(1).

D. *Section 35 of the Constitution Act, 1982*

[29] Section 35 of the *Constitution Act, 1982* reads:

contrôle de la décision « manifestement déraisonnable » [TRADUCTION] « la conclusion de fait ou de droit ou l'exercice du pouvoir discrétionnaire relatifs à une question sur laquelle le tribunal a compétence exclusive du fait de l'existence d'une disposition d'inattaquabilité ». La norme de contrôle de la décision correcte vaut pour [TRADUCTION] « toute [autre] question ».

[28] On peut aussi soutenir que le par. 44(1) de l'*Administrative Tribunals Act* a une incidence sur la compétence de la Commission en ce qu'il s'applique à celle-ci suivant le par. 2(4) de la *Utilities Commission Act*. Le paragraphe 44(1) de l'*Administrative Tribunals Act* dispose qu'[TRADUCTION] « [u]n tribunal administratif n'a pas compétence pour trancher une question constitutionnelle ». L'article premier de l'*Administrative Tribunals Act* délimite cette matière par renvoi à l'art. 8 de la *Constitutional Question Act*, R.S.B.C. 1996, ch. 68. Voici le texte du par. 8(2) de cette loi :

[TRADUCTION]

8. . . .

(2) Lorsque dans une instance, y compris un dossier ou une affaire,

- a) la validité ou l'applicabilité constitutionnelle d'une loi est contestée ou
- b) une réparation constitutionnelle est demandée,

la loi ne doit pas être tenue pour invalide ou inapplicable, et la réparation ne doit pas être accordée sans qu'un avis de la contestation ou de la demande n'ait été signifié au procureur général du Canada et au procureur général de la Colombie-Britannique.

La [TRADUCTION] « réparation constitutionnelle » est définie comme étant « la réparation visée au par. 24(1) de la *Loi constitutionnelle de 1982*, hormis celle consistant à écarter un élément de preuve ou découlant d'une telle mesure » : *Constitutional Question Act*, par. 8(1).

D. *L'article 35 de la Loi constitutionnelle de 1982*

[29] Voici le libellé de l'art. 35 de la *Loi constitutionnelle de 1982* :

**35.** (1) The existing aboriginal and treaty rights of the aboriginal peoples of Canada are hereby recognized and affirmed.

(2) In this Act, “aboriginal peoples of Canada” includes the Indian, Inuit and Métis peoples of Canada.

(3) For greater certainty, in subsection (1) “treaty rights” includes rights that now exist by way of land claims agreements or may be so acquired.

(4) Notwithstanding any other provision of this Act, the aboriginal and treaty rights referred to in subsection (1) are guaranteed equally to male and female persons.

### III. The Issues

[30] The main issues that must be resolved are: (1) whether the Commission had jurisdiction to consider consultation; and (2) if so, whether the Commission’s refusal to rescope the inquiry to consider consultation should be set aside. In order to resolve these issues, it is necessary to consider when a duty to consult arises and the role of tribunals in relation to the duty to consult. These reasons will therefore consider:

1. When a duty to consult arises;
2. The role of tribunals in consultation;
3. The Commission’s jurisdiction to consider consultation;
4. The Commission’s Reconsideration Decision;
5. The Commission’s conclusion that approval of the 2007 EPA was in the public interest.

### IV. Analysis

#### A. *When Does the Duty to Consult Arise?*

[31] The Court in *Haida Nation* answered this question as follows: the duty to consult arises “when

**35.** (1) Les droits existants — ancestraux ou issus de traités — des peuples autochtones du Canada sont reconnus et confirmés.

(2) Dans la présente loi, « peuples autochtones du Canada » s’entend notamment des Indiens, des Inuits et des Métis du Canada.

(3) Il est entendu que sont compris parmi les droits issus de traités, dont il est fait mention au paragraphe (1), les droits existants issus d’accords sur des revendications territoriales ou ceux susceptibles d’être ainsi acquis.

(4) Indépendamment de toute autre disposition de la présente loi, les droits — ancestraux ou issus de traités — visés au paragraphe (1) sont garantis également aux personnes des deux sexes.

### III. Les questions en litige

[30] Les principales questions à trancher sont les suivantes : (1) la Commission avait-elle compétence pour se prononcer sur la consultation et (2), dans l’affirmative, le refus de la Commission de redéfinir le cadre de l’audience pour que la question de la consultation soit abordée devrait-il être annulé? Il faut dès lors déterminer les conditions auxquelles il y a obligation de consulter et examiner le rôle du tribunal administratif à l’égard de cette obligation. J’examinerai donc successivement ce qui suit :

1. les conditions auxquelles il y a obligation de consulter;
2. le rôle du tribunal administratif à l’égard de la consultation;
3. le pouvoir de la Commission de se prononcer sur la consultation;
4. la décision de la Commission sur la demande de révision;
5. la conclusion de la Commission portant que l’approbation du CAÉ de 2007 servait l’intérêt public.

### IV. Analyse

#### A. *À quelles conditions y a-t-il obligation de consulter?*

[31] Dans l’arrêt *Nation Haïda*, notre Cour établit que l’obligation de consulter prend naissance

the Crown has knowledge, real or constructive, of the potential existence of the Aboriginal right or title and contemplates conduct that might adversely affect it” (para. 35). This test can be broken down into three elements: (1) the Crown’s knowledge, actual or constructive, of a potential Aboriginal claim or right; (2) contemplated Crown conduct; and (3) the potential that the contemplated conduct may adversely affect an Aboriginal claim or right. I will discuss each of these elements in greater detail. First, some general comments on the source and nature of the duty to consult are in order.

[32] The duty to consult is grounded in the honour of the Crown. It is a corollary of the Crown’s obligation to achieve the just settlement of Aboriginal claims through the treaty process. While the treaty claims process is ongoing, there is an implied duty to consult with the Aboriginal claimants on matters that may adversely affect their treaty and Aboriginal rights, and to accommodate those interests in the spirit of reconciliation: *Haida Nation*, at para. 20. As stated in *Haida Nation*, at para. 25:

Put simply, Canada’s Aboriginal peoples were here when Europeans came, and were never conquered. Many bands reconciled their claims with the sovereignty of the Crown through negotiated treaties. Others, notably in British Columbia, have yet to do so. The potential rights embedded in these claims are protected by s. 35 of the *Constitution Act, 1982*. The honour of the Crown requires that these rights be determined, recognized and respected. This, in turn, requires the Crown, acting honourably, to participate in processes of negotiation. While this process continues, the honour of the Crown may require it to consult and, where indicated, accommodate Aboriginal interests.

[33] The duty to consult described in *Haida Nation* derives from the need to protect Aboriginal interests while land and resource claims are ongoing or when the proposed action may impinge on an Aboriginal right. Absent this duty, Aboriginal groups seeking to protect their interests pending a

« lorsque la Couronne a connaissance, concrètement ou par imputation, de l’existence potentielle du droit ou titre ancestral revendiqué et envisage des mesures susceptibles d’avoir un effet préjudiciable sur celui-ci » (par. 35). Ce critère comporte trois volets : (1) la connaissance par la Couronne, réelle ou imputée, de l’existence possible d’une revendication autochtone ou d’un droit ancestral, (2) la mesure envisagée de la Couronne et (3) la possibilité que cette mesure ait un effet préjudiciable sur une revendication autochtone ou un droit ancestral. J’examinerai chacun de ces volets plus en détail. D’abord, quelques remarques générales sont de mise concernant la source et la nature de l’obligation de consulter.

[32] L’obligation de consulter s’origine de l’honneur de la Couronne. Elle est un corollaire de celle d’arriver à un règlement équitable des revendications autochtones au terme du processus de négociation de traités. Lorsque les négociations sont en cours, la Couronne a l’obligation tacite de consulter les demandeurs autochtones sur ce qui est susceptible d’avoir un effet préjudiciable sur leurs droits issus de traités et leurs droits ancestraux, et de trouver des mesures d’accommodement dans un esprit de conciliation : *Nation Haïda*, par. 20. Comme le dit la Cour au par. 25 de cet arrêt :

En bref, les Autochtones du Canada étaient déjà ici à l’arrivée des Européens; ils n’ont jamais été conquis. De nombreuses bandes ont concilié leurs revendications avec la souveraineté de la Couronne en négociant des traités. D’autres, notamment en Colombie-Britannique, ne l’ont pas encore fait. Les droits potentiels visés par ces revendications sont protégés par l’art. 35 de la *Loi constitutionnelle de 1982*. L’honneur de la Couronne commande que ces droits soient déterminés, reconnus et respectés. Pour ce faire, la Couronne doit agir honnêtement et négocier. Au cours des négociations, l’honneur de la Couronne peut obliger celle-ci à consulter les Autochtones et, s’il y a lieu, à trouver des accommodements à leurs intérêts.

[33] L’obligation de consulter dont il est fait état dans l’arrêt *Nation Haïda* découle de la nécessité de protéger les intérêts autochtones lorsque des terres ou des ressources font l’objet de revendications ou que la mesure projetée peut empiéter sur un droit ancestral. Sans le respect de cette

final settlement would need to commence litigation and seek interlocutory injunctions to halt the threatening activity. These remedies have proven time-consuming, expensive, and are often ineffective. Moreover, with a few exceptions, many Aboriginal groups have limited success in obtaining injunctions to halt development or activities on the land in order to protect contested Aboriginal or treaty rights.

[34] Grounded in the honour of the Crown, the duty has both a legal and a constitutional character: *R. v. Kapp*, 2008 SCC 41, [2008] 2 S.C.R. 483, at para. 6. The duty seeks to provide protection to Aboriginal and treaty rights while furthering the goals of reconciliation between Aboriginal peoples and the Crown. Rather than pitting Aboriginal peoples against the Crown in the litigation process, the duty recognizes that both must work together to reconcile their interests. It also accommodates the reality that often Aboriginal peoples are involved in exploiting the resource. Shutting down development by court injunction may serve the interest of no one. The honour of the Crown is therefore best reflected by a requirement for consultation with a view to reconciliation.

[35] *Haida Nation* sets the framework for dialogue prior to the final resolution of claims by requiring the Crown to take contested or established Aboriginal rights into account *before* making a decision that may have an adverse impact on them: J. Woodward, *Native Law*, vol. 1 (loose-leaf), at p. 5-35. The duty is *prospective*, fastening on rights yet to be proven.

[36] The nature of the duty varies with the situation. The richness of the required consultation increases with the strength of the *prima facie* Aboriginal claim and the seriousness of the impact on the underlying Aboriginal or treaty right: *Haida Nation*, at paras. 43-45, and *Taku River Tlingit First Nation v. British Columbia (Project Assessment*

obligation, un groupe autochtone désireux de protéger ses intérêts jusqu'au règlement d'une revendication devrait s'adresser au tribunal pour obtenir une injonction interlocutoire ordonnant la cessation de l'activité préjudiciable. L'expérience enseigne qu'il s'agit d'une démarche longue, coûteuse et souvent vaine. De plus, sauf quelques exceptions, les groupes autochtones réussissent rarement à obtenir une injonction pour mettre fin à la mise en valeur des terres ou aux activités qui y sont exercées et ainsi protéger des droits ancestraux ou issus de traités qui sont contestés.

[34] Fondée sur l'honneur de la Couronne, l'obligation revêt un caractère à la fois juridique et constitutionnel : *R. c. Kapp*, 2008 CSC 41, [2008] 2 R.C.S. 483, par. 6. Elle vise la protection des droits ancestraux et issus de traités, ainsi que la réalisation de l'objectif de conciliation des intérêts des Autochtones et de ceux de la Couronne. Elle reconnaît que les deux parties doivent collaborer pour concilier leurs intérêts au lieu de s'opposer dans un litige. Elle tient aussi compte du fait que les peuples autochtones participent souvent à l'exploitation des ressources. Empêcher la mise en valeur par voie d'injonction risque de ne servir l'intérêt de personne. L'honneur de la Couronne est donc davantage compatible avec une obligation de consulter axée sur la conciliation des intérêts respectifs des parties.

[35] L'arrêt *Nation Haïda* jette les bases du dialogue préalable au règlement définitif des revendications en obligeant la Couronne à tenir compte des droits ancestraux contestés ou établis *avant* de prendre une décision susceptible d'avoir un effet préjudiciable sur ces droits : J. Woodward, *Native Law*, vol. 1 (feuilles mobiles), p. 5-35. Il s'agit d'une obligation de nature *prospective* prenant appui sur des droits dont l'existence reste à prouver.

[36] La nature de l'obligation varie en fonction de la situation. La consultation exigée est plus approfondie lorsque la revendication autochtone paraît de prime abord fondée et que l'effet sur le droit ancestral ou issu de traité sous-jacent est grave : *Nation Haïda*, par. 43-45, et *Première nation Tlingit de Taku River c. Colombie-Britannique (Directeur*

*Director*), 2004 SCC 74, [2004] 3 S.C.R. 550, at para. 32.

[37] The remedy for a breach of the duty to consult also varies with the situation. The Crown's failure to consult can lead to a number of remedies ranging from injunctive relief against the threatening activity altogether, to damages, to an order to carry out the consultation prior to proceeding further with the proposed government conduct: *Haida Nation*, at paras. 13-14.

[38] The duty to consult embodies what Brian Slattery has described as a "generative" constitutional order which sees "section 35 as serving a dynamic and not simply static function" ("Aboriginal Rights and the Honour of the Crown" (2005), 29 *S.C.L.R.* (2d) 433, at p. 440). This dynamicism was articulated in *Haida Nation* as follows, at para. 32:

... the duty to consult and accommodate is part of a process of fair dealing and reconciliation that begins with the assertion of sovereignty and continues beyond formal claims resolution. Reconciliation is not a final legal remedy in the usual sense. Rather, it is a process flowing from rights guaranteed by s. 35(1) of the *Constitution Act, 1982*.

As the post-*Haida Nation* case law confirms, consultation is "[c]oncerned with an ethic of ongoing relationships" and seeks to further an ongoing process of reconciliation by articulating a preference for remedies "that promote ongoing negotiations": D. G. Newman, *The Duty to Consult: New Relationships with Aboriginal Peoples* (2009), at p. 21.

[39] Against this background, I now turn to the three elements that give rise to a duty to consult.

(1) Knowledge by the Crown of a Potential Claim or Right

[40] To trigger the duty to consult, the Crown must have real or constructive knowledge of a

*d'évaluation de projet*), 2004 CSC 74, [2004] 3 R.C.S. 550, par. 32.

[37] Le recours pour manquement à l'obligation de consulter varie également en fonction de la situation. L'omission de la Couronne de consulter les intéressés peut donner lieu à un certain nombre de mesures allant de l'injonction visant l'activité préjudiciable, à l'indemnisation, voire à l'ordonnance enjoignant au gouvernement de consulter avant d'aller de l'avant avec son projet : *Nation Haida*, par. 13-14.

[38] L'obligation de consulter s'inscrit dans ce que Brian Slattery qualifie d'ordre constitutionnel [TRADUCTION] « génératif » où « l'article 35 a une fonction dynamique et non purement statique » (« Aboriginal Rights and the Honour of the Crown » (2005), 29 *S.C.L.R.* (2d) 433, p. 440). Ce dynamisme a été formulé comme suit dans l'arrêt *Nation Haida* (par. 32) :

... l'obligation de consulter et d'accommoder fait partie intégrante du processus de négociation honorable et de conciliation qui débute au moment de l'affirmation de la souveraineté et se poursuit au-delà du règlement formel des revendications. La conciliation ne constitue pas une réparation juridique définitive au sens usuel du terme. Il s'agit plutôt d'un processus découlant des droits garantis par le par. 35(1) de la *Loi constitutionnelle de 1982*.

Comme le confirme la jurisprudence postérieure à cet arrêt, la consultation [TRADUCTION] « s'attache au maintien de relations constantes » et à l'établissement d'un processus permanent de conciliation en ce qu'elle privilégie les mesures « qui favorisent la continuité des négociations » : D. G. Newman, *The Duty to Consult: New Relationships with Aboriginal Peoples* (2009), p. 21.

[39] Sur cette toile de fond, j'examine maintenant les trois éléments qui font naître l'obligation de consulter.

(1) Connaissance par la Couronne de l'existence possible d'une revendication ou d'un droit

[40] Pour qu'elle ait l'obligation de consulter, la Couronne doit avoir connaissance, concrètement



claim to the resource or land to which it attaches: *Haida Nation*, at para. 35. The threshold, informed by the need to maintain the honour of the Crown, is not high. Actual knowledge arises when a claim has been filed in court or advanced in the context of negotiations, or when a treaty right may be impacted: *Mikisew Cree First Nation v. Canada (Minister of Canadian Heritage)*, 2005 SCC 69, [2005] 3 S.C.R. 388, para. 34. Constructive knowledge arises when lands are known or reasonably suspected to have been traditionally occupied by an Aboriginal community or an impact on rights may reasonably be anticipated. While the existence of a potential claim is essential, proof that the claim will succeed is not. What is required is a credible claim. Tenuous claims, for which a strong *prima facie* case is absent, may attract a mere duty of notice. As stated in *Haida Nation*, at para. 37:

Knowledge of a credible but unproven claim suffices to trigger a duty to consult and accommodate. The content of the duty, however, varies with the circumstances, as discussed more fully below. A dubious or peripheral claim may attract a mere duty of notice, while a stronger claim may attract more stringent duties. The law is capable of differentiating between tenuous claims, claims possessing a strong *prima facie* case, and established claims.

[41] The claim or right must be one which actually exists and stands to be affected by the proposed government action. This flows from the fact that the purpose of consultation is to protect unproven or established rights from irreversible harm as the settlement negotiations proceed: Newman, at p. 30, citing *Haida Nation*, at paras. 27 and 33.

## (2) Crown Conduct or Decision

[42] Second, for a duty to consult to arise, there must be Crown conduct or a Crown decision that

ou par imputation, d'une revendication visant la ressource ou la terre qui s'y rattache : *Nation Haïda*, par. 35. La norme de preuve applicable, eu égard à la nécessité de préserver l'honneur de la Couronne, n'est pas stricte. Il y a connaissance réelle lorsqu'une revendication a été formulée dans une instance judiciaire ou lors de négociations, ou lorsqu'un droit issu de traité peut être touché : *Première nation crie Mikisew c. Canada (Ministre du Patrimoine canadien)*, 2005 CSC 69, [2005] 3 R.C.S. 388, par. 34. Il y a connaissance par imputation lorsque l'on sait ou que l'on soupçonne raisonnablement que les terres ont été traditionnellement occupées par une collectivité autochtone ou que l'on peut raisonnablement prévoir qu'il y aura une incidence sur des droits. L'existence possible d'une revendication est essentielle, mais il n'est pas nécessaire de prouver que la revendication connaîtra une issue favorable. La revendication doit seulement être crédible. La revendication à l'assise fragile, dont le fondement ne paraît pas plausible à première vue, peut ne faire naître qu'une obligation d'informer. Comme l'affirme notre Cour dans l'arrêt *Nation Haïda* (par. 37) :

La connaissance d'une revendication crédible mais non encore établie suffit à faire naître l'obligation de consulter et d'accommoder. Toutefois, le contenu de l'obligation varie selon les circonstances, comme nous le verrons de façon plus approfondie plus loin. Une revendication douteuse ou marginale peut ne requérir qu'une simple obligation d'informer, alors qu'une revendication plus solide peut faire naître des obligations plus contraignantes. Il est possible en droit de différencier les revendications reposant sur une preuve ténue des revendications reposant sur une preuve à première vue solide et de celles déjà établies.

[41] Il faut que la revendication ou le droit existe réellement et risque d'être compromis par la mesure gouvernementale, car l'objectif de la consultation est de protéger un droit, établi ou non, d'un préjudice irréparable, pendant les négociations en vue d'un règlement : Newman, p. 30, citant *Nation Haïda*, par. 27 et 33.

## (2) Mesure ou décision de la Couronne

[42] Deuxièmement, pour que naisse l'obligation de consulter, la mesure ou la décision de la

engages a potential Aboriginal right. What is required is conduct that may adversely impact on the claim or right in question.

[43] This raises the question of what government action engages the duty to consult. It has been held that such action is not confined to government exercise of statutory powers: *Huu-Ay-Aht First Nation v. British Columbia (Minister of Forests)*, 2005 BCSC 697, [2005] 3 C.N.L.R. 74, at paras. 94 and 104; *Wii'litswx v. British Columbia (Minister of Forests)*, 2008 BCSC 1139, [2008] 4 C.N.L.R. 315, at paras. 11-15. This accords with the generous, purposive approach that must be brought to the duty to consult.

[44] Further, government action is not confined to decisions or conduct which have an immediate impact on lands and resources. A potential for adverse impact suffices. Thus, the duty to consult extends to “strategic, higher level decisions” that may have an impact on Aboriginal claims and rights (Woodward, at p. 5-41 (emphasis omitted)). Examples include the transfer of tree licences which would have permitted the cutting of old-growth forest (*Haida Nation*); the approval of a multi-year forest management plan for a large geographic area (*Klahoose First Nation v. Sunshine Coast Forest District (District Manager)*, 2008 BCSC 1642, [2009] 1 C.N.L.R. 110); the establishment of a review process for a major gas pipeline (*Dene Tha' First Nation v. Canada (Minister of Environment)*, 2006 FC 1354, [2007] 1 C.N.L.R. 1, aff'd 2008 FCA 20, 35 C.E.L.R. (3d) 1); and the conduct of a comprehensive inquiry to determine a province's infrastructure and capacity needs for electricity transmission (*An Inquiry into British Columbia's Electricity Transmission Infrastructure & Capacity Needs for the Next 30 Years, Re*, 2009 CarswellBC 3637 (B.C.U.C.)). We leave for another day the question of whether government conduct includes legislative action: see *R. v. Lefthand*, 2007 ABCA 206, 77 Alta. L.R. (4th) 203, at paras. 37-40.

Couronne doit mettre en jeu un droit ancestral éventuel. La mesure doit être susceptible d'avoir un effet préjudiciable sur la revendication ou le droit en question.

[43] Dès lors, la question qui se pose est celle de savoir quelle mesure oblige le gouvernement à consulter. Il a été établi que cette mesure ne s'entend pas uniquement de l'exercice d'un pouvoir conféré par la loi : *Huu-Ay-Aht First Nation c. British Columbia (Minister of Forests)*, 2005 BCSC 697, [2005] 3 C.N.L.R. 74, par. 94 et 104; *Wii'litswx c. British Columbia (Minister of Forests)*, 2008 BCSC 1139, [2008] 4 C.N.L.R. 315, par. 11-15. Cette conclusion s'inscrit dans l'approche généreuse et téléologique que commande l'obligation de consulter.

[44] En outre, une mesure gouvernementale ne s'entend pas uniquement d'une décision ou d'un acte qui a un effet immédiat sur des terres et des ressources. Un simple risque d'effet préjudiciable suffit. Ainsi, l'obligation de consulter naît aussi d'une [TRADUCTION] « décision stratégique prise en haut lieu » qui est susceptible d'avoir un effet sur des revendications autochtones et des droits ancestraux (Woodward, p. 5-41 (italiques omis)). Mentionnons quelques exemples : la cession de concessions de ferme forestière qui auraient permis l'abattage d'arbres dans de vieilles forêts (*Nation Haïda*), l'approbation d'un plan pluriannuel de gestion forestière visant un vaste secteur géographique (*Khaloose First Nation c. Sunshine Coast Forest District (District Manager)*, 2008 BCSC 1642, [2009] 1 C.N.L.R. 110), la création d'un processus d'examen relativement à un gazoduc important (*Première nation Dene Tha' c. Canada (Ministre de l'Environnement)*, 2006 CF 1354 (CanLII), conf. par 2008 CAF 20 (CanLII)), et l'examen approfondi des besoins d'infrastructure et de capacité de transport d'électricité d'une province (*An Inquiry into British Columbia's Electricity Transmission Infrastructure & Capacity Needs for the Next 30 Years, Re*, 2009 CarswellBC 3637 (B.C.U.C.)). La question de savoir si une mesure gouvernementale s'entend aussi d'une mesure législative devra être tranchée dans une affaire ultérieure : voir *R. c. Lefthand*, 2007 ABCA 206, 77 Alta. L.R. (4th) 203, par. 37-40.

(3) Adverse Effect of the Proposed Crown Conduct on an Aboriginal Claim or Right

[45] The third element of a duty to consult is the possibility that the Crown conduct may affect the Aboriginal claim or right. The claimant must show a causal relationship between the proposed government conduct or decision and a potential for adverse impacts on pending Aboriginal claims or rights. Past wrongs, including previous breaches of the duty to consult, do not suffice.

[46] Again, a generous, purposive approach to this element is in order, given that the doctrine's purpose, as stated by Newman, is "to recognize that actions affecting unproven Aboriginal title or rights or treaty rights can have irreversible effects that are not in keeping with the honour of the Crown" (p. 30, citing *Haida Nation*, at paras. 27 and 33). Mere speculative impacts, however, will not suffice. As stated in *R. v. Douglas*, 2007 BCCA 265, 278 D.L.R. (4th) 653, at para. 44, there must be an "appreciable adverse effect on the First Nations' ability to exercise their aboriginal right". The adverse effect must be on the future exercise of the right itself; an adverse effect on a First Nation's future negotiating position does not suffice.

[47] Adverse impacts extend to any effect that may prejudice a pending Aboriginal claim or right. Often the adverse effects are physical in nature. However, as discussed in connection with what constitutes Crown conduct, high-level management decisions or structural changes to the resource's management may also adversely affect Aboriginal claims or rights even if these decisions have no "immediate impact on lands and resources": Woodward, at p. 5-41. This is because such structural changes to the resources management may set the stage for further decisions that will have a *direct* adverse impact on land and resources. For example,

(3) Effet préjudiciable de la mesure projetée par la Couronne sur une revendication autochtone ou un droit ancestral

[45] Le troisième élément requis pour qu'il y ait obligation de consulter est la possibilité que la mesure de la Couronne ait un effet sur une revendication autochtone ou un droit ancestral. Le demandeur doit établir un lien de causalité entre la mesure ou la décision envisagée par le gouvernement et un effet préjudiciable éventuel sur une revendication autochtone ou un droit ancestral. Un acte fautif commis dans le passé, telle l'omission de consulter, ne suffit pas.

[46] Une approche généreuse et téléologique est aussi de mise à l'égard de ce troisième élément puisque, comme le dit Newman, l'objectif poursuivi est [TRADUCTION] « de reconnaître que les actes touchant un titre aborigène ou un droit ancestral non encore établi, ou des droits issus de traités, peuvent avoir des répercussions irréversibles qui sont incompatibles avec l'honneur de la Couronne » (p. 30, citant l'arrêt *Nation Haida*, par. 27 et 33). Cependant, de simples répercussions hypothétiques ne suffisent pas. Comme il appert de l'arrêt *R. c. Douglas*, [2007] BCCA 265, 278 D.L.R. (4th) 653, au par. 44, il doit y avoir un [TRADUCTION] « effet préjudiciable important sur la possibilité qu'une Première nation puisse exercer son droit ancestral ». Le préjudice doit toucher l'exercice futur du droit lui-même, et non seulement la position de négociation ultérieure de la Première nation.

[47] L'effet préjudiciable comprend toute répercussion risquant de compromettre une revendication autochtone ou un droit ancestral. Il est souvent de nature physique. Cependant, comme on l'a vu relativement à ce qui constitue une mesure de la Couronne, la décision prise en haut lieu ou la modification structurelle apportée à la gestion de la ressource risque aussi d'avoir un effet préjudiciable sur une revendication autochtone ou un droit ancestral, et ce, même si elle n'a pas d'[TRADUCTION] « effet immédiat sur les terres et les ressources » : Woodward, p. 5-41. La raison en est qu'une telle modification structurelle de la

a contract that transfers power over a resource from the Crown to a private party may remove or reduce the Crown's power to ensure that the resource is developed in a way that respects Aboriginal interests in accordance with the honour of the Crown. The Aboriginal people would thus effectively lose or find diminished their constitutional right to have their interests considered in development decisions. This is an adverse impact: see *Haida Nation*, at paras. 72-73.

[48] An underlying or continuing breach, while remediable in other ways, is not an adverse impact for the purposes of determining whether a particular government decision gives rise to a duty to consult. The duty to consult is designed to prevent damage to Aboriginal claims and rights while claim negotiations are underway: *Haida Nation*, at para. 33. The duty arises when the Crown has *knowledge*, real or constructive, of the potential or actual existence of the Aboriginal right or title “and contemplates conduct that might adversely affect it”: *Haida Nation*, at para. 35 (emphasis added). This test was confirmed by the Court in *Mikisew Cree* in the context of treaty rights, at paras. 33-34.

[49] The question is whether there is a claim or right that potentially may be adversely impacted by the *current* government conduct or decision in question. Prior and continuing breaches, including prior failures to consult, will only trigger a duty to consult if the present decision has the potential of causing a novel adverse impact on a present claim or existing right. This is not to say that there is no remedy for past and continuing breaches, including previous failures to consult. As noted in *Haida Nation*, a breach of the duty to consult may be remedied in various ways, including the awarding of damages. To trigger a fresh duty of consultation — the matter which is here at issue — a contemplated

gestion de la ressource peut ouvrir la voie à d'autres décisions ayant un effet préjudiciable *direct* sur les terres et les ressources. Par exemple, le contrat par lequel la Couronne cède à une partie privée la maîtrise d'une ressource risque de supprimer ou de réduire le pouvoir de la Couronne de faire en sorte que la ressource soit exploitée dans le respect des intérêts autochtones, conformément à l'honneur de la Couronne. Les Autochtones seraient alors dépouillés en tout ou en partie de leur droit constitutionnel de voir leurs intérêts pris en considération dans les décisions de mise en valeur, ce qui constitue un effet préjudiciable : voir l'arrêt *Nation Haïda*, par. 72-73.

[48] Une atteinte sous-jacente ou continue, même si elle ouvre droit à d'autres recours, ne constitue pas un effet préjudiciable lorsqu'il s'agit de déterminer si une décision gouvernementale particulière emporte l'obligation de consulter. La raison d'être de cette obligation est d'empêcher que les revendications autochtones et les droits ancestraux ne soient compromis pendant les négociations auxquelles ils donnent lieu : *Nation Haïda*, par. 33. L'obligation naît lorsque la Couronne a *connaissance*, concrètement ou par imputation, de l'existence potentielle ou réelle du droit ou titre ancestral revendiqué et qu'elle « envisage des mesures susceptibles d'avoir un effet préjudiciable sur celui-ci » : *Nation Haïda*, par. 35 (je souligne). Ce critère est repris par notre Cour relativement à des droits issus de traités dans l'arrêt *Première nation crie Mikisew*, par. 33-34.

[49] Il faut déterminer si une revendication ou un droit est susceptible d'être compromis par la mesure ou la décision *actuelle* du gouvernement. L'atteinte antérieure et continue, y compris l'omission de consulter, ne fait naître l'obligation de consulter que si la décision actuelle risque d'avoir un nouvel effet défavorable sur une revendication actuelle ou un droit existant. Il peut néanmoins y avoir recours pour une atteinte antérieure et continue, y compris l'omission de consulter. Comme le signale la Cour dans l'arrêt *Nation Haïda*, le non-respect de l'obligation de consulter peut donner droit à diverses réparations, dont l'indemnisation. Pour que naisse une nouvelle obligation de

Crown action must put current claims and rights in jeopardy.

[50] Nor does the definition of what constitutes an adverse effect extend to adverse impacts on the negotiating position of an Aboriginal group. The duty to consult, grounded in the need to protect Aboriginal rights and to preserve the future use of the resources claimed by Aboriginal peoples while balancing countervailing Crown interests, no doubt may have the ulterior effect of delaying ongoing development. The duty may thus serve not only as a tool to settle interim resource issues but also, and incidentally, as a tool to achieve longer term compensatory goals. Thus conceived, the duty to consult may be seen as a necessary element in the overall scheme of satisfying the Crown's constitutional duties to Canada's First Nations. However, cut off from its roots in the need to preserve Aboriginal interests, its purpose would be reduced to giving one side in the negotiation process an advantage over the other.

#### (4) An Alternative Theory of Consultation

[51] As we have seen, the duty to consult arises when: (1) the Crown has knowledge, actual or constructive, of potential aboriginal claims or rights; (2) the Crown proposes conduct or a decision; and (3) that conduct or decision may have an adverse impact on the Aboriginal claims or rights. This requires demonstration of a causal connection between the proposed Crown conduct and a potential adverse impact on an Aboriginal claim or right.

[52] The respondent's submissions are based on a broader view of the duty to consult. It argues that even if the 2007 EPA will have no impact on the Nechako River water levels, the Nechako fisheries

consulter — ce dont il est question en l'espèce —, une mesure envisagée par la Couronne doit mettre en péril une revendication actuelle ou un droit existant.

[50] L'effet préjudiciable ne s'entend pas non plus d'une répercussion négative sur la position de négociation d'un groupe autochtone. L'obligation de consulter, que justifie la nécessité de protéger les droits ancestraux et de préserver l'utilisation ultérieure des ressources revendiquées par les peuples autochtones, compte tenu des intérêts opposés de la Couronne, peut assurément retarder au final la mise en valeur entreprise. Elle peut donc servir non seulement à régler provisoirement une question relative aux ressources, mais aussi, accessoirement, à atteindre un objectif d'indemnisation à long terme. Vue sous cet angle, l'obligation de consulter peut être considérée comme un maillon essentiel du dispositif global permettant à la Couronne de s'acquitter de ses obligations constitutionnelles envers les Premières nations du Canada. Toutefois, dissociée de sa raison d'être qu'est la nécessité de préserver les intérêts autochtones, l'obligation de consulter viserait seulement à favoriser une partie par rapport à une autre dans le processus de négociation.

#### (4) Interprétation nouvelle de l'obligation de consulter

[51] Rappelons que l'obligation de consulter prend naissance lorsque (1) la Couronne a connaissance, concrètement ou par imputation, de l'existence possible d'une revendication autochtone ou d'un droit ancestral, (2) qu'elle envisage une mesure ou une décision et (3) que cette mesure ou cette décision est susceptible d'avoir un effet préjudiciable sur la revendication autochtone ou le droit ancestral. Il faut donc établir un lien de causalité entre la mesure projetée par la Couronne et l'effet préjudiciable possible sur une revendication autochtone ou un droit ancestral.

[52] L'intimé fonde ses prétentions sur une interprétation plus large de l'obligation de consulter. Il prétend que même si le CAÉ de 2007 n'aura aucun impact sur les niveaux d'eau de la rivière

or the management of the contested resource, the duty to consult may be triggered because the 2007 EPA is part of a larger hydro-electric project which continues to impact its rights. The effect of this proposition is that if the Crown proposes an action, however limited, that relates to a project that impacts Aboriginal claims or rights, a fresh duty to consult arises. The current government action or decision, however inconsequential, becomes the hook that secures and reels in the constitutional duty to consult on the entire resource.

[53] I cannot accept this view of the duty to consult. *Haida Nation* negates such a broad approach. It grounded the duty to consult in the need to preserve Aboriginal rights and claims pending resolution. It confines the duty to consult to adverse impacts flowing from the specific Crown proposal at issue — not to larger adverse impacts of the project of which it is a part. The subject of the consultation is the impact on the claimed rights of the *current* decision under consideration.

[54] The argument for a broader duty to consult invokes the logic of the fruit of the poisoned tree — an evidentiary doctrine that holds that past wrongs preclude the Crown from subsequently benefiting from them. Thus, it is suggested that the failure to consult with the CSTC First Nations on the initial dam and water diversion project prevents any further development of that resource without consulting on the entirety of the resource and its management. Yet, as *Haida Nation* pointed out, the failure to consult gives rise to a variety of remedies, including damages. An order compelling consultation is only appropriate where the proposed Crown conduct, immediate or prospective, may adversely impact on established or claimed rights. Absent this, other remedies may be more appropriate.

Nechako, ses stocks de poissons ou la gestion de la ressource visée par le litige, il peut y avoir obligation de consulter, car le CAÉ de 2007 fait partie d'un projet hydroélectrique qui continue d'avoir des répercussions sur ses droits. Dès lors, si la Couronne projette quelque mesure — aussi modeste soit-elle — se rapportant à un projet qui touche une revendication autochtone ou un droit ancestral, une nouvelle obligation de consulter voit le jour. La mesure ou la décision gouvernementale en cause, qu'elle ait peu de conséquences, voire aucune, devient le fondement de l'obligation constitutionnelle de consulter relativement à la totalité de la ressource.

[53] Je ne peux adhérer à cette interprétation de l'obligation de consulter. L'arrêt *Nation Haïda* écarte une interprétation aussi large. La Cour y fait reposer l'obligation de consulter sur la nécessité de préserver les droits ancestraux allégués jusqu'au règlement des revendications. L'objet de la consultation se limite donc aux seuls effets préjudiciables de la mesure précise projetée par la Couronne, à l'exclusion des effets préjudiciables globaux du projet dont elle fait partie. La consultation s'intéresse à l'effet de la décision *actuellement* considérée sur les droits revendiqués.

[54] La thèse d'une obligation de consulter plus étendue s'appuie sur un principe en matière de preuve — celui du fruit de l'arbre empoisonné — selon lequel la Couronne ne saurait aujourd'hui tirer avantage de ses fautes d'hier. L'intimé prétend donc que l'omission de consulter les Premières nations du CTCS au sujet du projet initial de barrage et de dérivation d'eau empêche toute poursuite de l'exploitation de cette ressource tant qu'il n'y a pas eu consultation sur l'ensemble de la ressource et de sa gestion. Or, comme le fait observer la Cour dans l'arrêt *Nation Haïda*, l'absence de consultation ouvre droit à diverses réparations, y compris l'indemnisation. L'ordonnance de consulter n'est indiquée que lorsque la mesure projetée par la Couronne, qu'elle soit immédiate ou prospective, est susceptible d'avoir un effet préjudiciable sur des droits établis ou revendiqués. Sinon, d'autres réparations peuvent être plus indiquées.

B. *The Role of Tribunals in Consultation*

[55] The duty on a tribunal to consider consultation and the scope of that inquiry depends on the mandate conferred by the legislation that creates the tribunal. Tribunals are confined to the powers conferred on them by their constituent legislation: *R. v. Conway*, 2010 SCC 22, [2010] 1 S.C.R. 765. It follows that the role of particular tribunals in relation to consultation depends on the duties and powers the legislature has conferred on it.

[56] The legislature may choose to delegate to a tribunal the Crown's duty to consult. As noted in *Haida Nation*, it is open to governments to set up regulatory schemes to address the procedural requirements of consultation at different stages of the decision-making process with respect to a resource.

[57] Alternatively, the legislature may choose to confine a tribunal's power to determinations of whether adequate consultation has taken place, as a condition of its statutory decision-making process. In this case, the tribunal is not itself engaged in the consultation. Rather, it is reviewing whether the Crown has discharged its duty to consult with a given First Nation about potential adverse impacts on their Aboriginal interest relevant to the decision at hand.

[58] Tribunals considering resource issues touching on Aboriginal interests may have neither of these duties, one of these duties, or both depending on what responsibilities the legislature has conferred on them. Both the powers of the tribunal to consider questions of law and the remedial powers granted it by the legislature are relevant considerations in determining the contours of that tribunal's jurisdiction: *Conway*. As such, they are also relevant to determining whether a particular tribunal has a duty to consult, a duty to consider consultation, or no duty at all.

[59] The decisions below and the arguments before us at times appear to merge the different

B. *Le rôle du tribunal administratif dans la consultation*

[55] L'obligation du tribunal administratif de se pencher sur la consultation et sur la portée de celle-ci dépend de la mission que lui confie sa loi constitutive. Un tribunal administratif doit s'en tenir à l'exercice des pouvoirs que lui confère sa loi habilitante : *R. c. Conway*, 2010 CSC 22, [2010] 1 R.C.S. 765. Il s'ensuit que le rôle d'un tribunal administratif en ce qui a trait à la consultation tient à ses obligations et à ses attributions légales.

[56] Le législateur peut décider de lui déléguer l'obligation de la Couronne de consulter. Comme le signale la Cour dans l'arrêt *Nation Haida*, il est loisible aux gouvernements de mettre en place des régimes de réglementation fixant les exigences procédurales de la consultation aux différentes étapes du processus décisionnel relatif à une ressource.

[57] Sinon, il peut lui confier le seul pouvoir de décider si une consultation adéquate a eu lieu, l'exercice de ce pouvoir faisant dès lors partie de son processus décisionnel. En pareil cas, le tribunal administratif ne participe pas à la consultation. Il s'assure plutôt que la Couronne s'est acquittée de son obligation de consulter une Première nation en particulier sur un éventuel effet préjudiciable de la décision en cause sur ses droits ancestraux.

[58] Le tribunal administratif appelé à examiner une question ayant trait à une ressource et ayant une incidence sur des intérêts autochtones peut n'avoir ni l'une ni l'autre de ces obligations, n'avoir que l'une d'elles ou avoir les deux, selon les attributions que lui confère le législateur. Tant son pouvoir légal d'examiner une question de droit que celui d'accorder réparation sont pertinents pour circonscrire sa compétence : *Conway*. Ils sont donc aussi pertinents pour déterminer si un tribunal administratif particulier est tenu d'effectuer une consultation ou de se pencher sur la consultation, ou s'il n'a aucune obligation en la matière.

[59] Les décisions des tribunaux inférieurs et les prétentions formulées devant notre Cour paraissent

duties of consultation and its review. In particular, it is suggested that every tribunal with jurisdiction to consider questions of law has a constitutional duty to consider whether adequate consultation has taken place and, if not, to itself fulfill the requirement regardless of whether its constituent statute so provides. The reasoning seems to be that this power flows automatically from the power of the tribunal to consider legal and hence constitutional questions. Lack of consultation amounts to a constitutional vice that vitiates the tribunal's jurisdiction and, in the case before us, makes it inconsistent with the public interest. In order to perform its duty, it must rectify the vice by itself engaging in the missing consultation.

[60] This argument cannot be accepted, in my view. A tribunal has only those powers that are expressly or implicitly conferred on it by statute. In order for a tribunal to have the power to enter into interim resource consultations with a First Nation, pending the final settlement of claims, the tribunal must be expressly or impliedly authorized to do so. The power to engage in consultation itself, as distinct from the jurisdiction to determine whether a duty to consult exists, cannot be inferred from the mere power to consider questions of law. Consultation itself is not a question of law; it is a distinct and often complex constitutional process and, in certain circumstances, a right involving facts, law, policy, and compromise. The tribunal seeking to engage in consultation itself must therefore possess remedial powers necessary to do what it is asked to do in connection with the consultation. The remedial powers of a tribunal will depend on that tribunal's enabling statute, and will require discerning the legislative intent: *Conway*, at para. 82.

[61] A tribunal that has the power to consider the adequacy of consultation, but does not itself have the power to enter into consultations, should provide whatever relief it considers appropriate in the circumstances, in accordance with the remedial powers expressly or impliedly conferred upon it by

parfois amalgamer les différentes obligations en ce qui concerne la consultation et le contrôle de leur exécution. On prétend plus particulièrement que tout tribunal administratif compétent pour examiner une question de droit a l'obligation constitutionnelle de s'assurer qu'il y a eu consultation adéquate et, s'il n'y en a pas eu, de consulter lui-même les intéressés, que sa loi constitutive le prévoit ou non. Le raisonnement veut que ce pouvoir découle automatiquement du pouvoir du tribunal administratif d'examiner des questions de droit et, par conséquent, des questions constitutionnelles. L'absence de consultation équivaldrait à un vice constitutionnel qui annulerait la compétence du tribunal administratif et qui, en l'espèce, la rendrait contraire à l'intérêt public. Pour s'acquitter de son obligation, le tribunal administratif devrait remédier au vice en effectuant lui-même la consultation.

[60] À mon avis, on ne peut faire droit à cette thèse. Un tribunal administratif n'a que les pouvoirs qui lui sont expressément ou implicitement conférés par la loi. Pour qu'il puisse consulter une Première nation au sujet d'une ressource avant le règlement définitif de revendications, il doit y être expressément ou implicitement autorisé. Le pouvoir de consulter, qui est distinct du pouvoir de déterminer s'il existe une obligation de consulter, ne peut être inféré du simple pouvoir d'examiner une question de droit. La consultation comme telle n'est pas une question de droit. Il s'agit d'un processus constitutionnel distinct, souvent complexe, et dans certaines circonstances, d'un droit mettant en jeu faits, droit, politique et compromis. Par conséquent, le tribunal administratif désireux d'effectuer lui-même la consultation doit avoir le pouvoir de réparation nécessaire pour faire ce à quoi on l'exhorte relativement à la consultation. Le pouvoir de réparation d'un tribunal administratif tient à sa loi habilitante et à l'intention du législateur : *Conway*, par. 82.

[61] Le tribunal administratif doté du pouvoir de se prononcer sur le caractère adéquat de la consultation, mais non du pouvoir d'effectuer celle-ci, doit accorder la réparation qu'il juge indiquée dans les circonstances, conformément aux pouvoirs de réparation qui lui sont expressément ou implicitement



statute. The goal is to protect Aboriginal rights and interests and to promote the reconciliation of interests called for in *Haida Nation*.

[62] The fact that administrative tribunals are confined to the powers conferred on them by the legislature, and must confine their analysis and orders to the ambit of the questions before them on a particular application, admittedly raises the concern that governments may effectively avoid their duty to consult by limiting a tribunal's statutory mandate. The fear is that if a tribunal is denied the power to consider consultation issues, or if the power to rule on consultation is split between tribunals so as to prevent any one from effectively dealing with consultation arising from particular government actions, the government might effectively be able to avoid its duty to consult.

[63] As the B.C. Court of Appeal rightly found, the duty to consult with Aboriginal groups, triggered when government decisions have the potential to adversely affect Aboriginal interests, is a constitutional duty invoking the honour of the Crown. It must be met. If the tribunal structure set up by the legislature is incapable of dealing with a decision's potential adverse impacts on Aboriginal interests, then the Aboriginal peoples affected must seek appropriate remedies in the courts: *Haida Nation*, at para. 51.

[64] Before leaving the role of tribunals in relation to consultation, it may be useful to review the standard of review that courts should apply in addressing the decisions of tribunals. The starting point is *Haida Nation*, at para. 61:

The existence or extent of the duty to consult or accommodate is a legal question in the sense that it defines a legal duty. However, it is typically premised on an assessment of the facts. It follows that a degree of deference to the findings of fact of the initial adjudicator may be appropriate. . . . Absent error on legal issues, the tribunal may be in a better position to evaluate the issue than the reviewing court, and some degree of

conférés par sa loi habilitante. L'objectif est de protéger les droits et les intérêts des Autochtones et de favoriser la conciliation d'intérêts que préconise notre Cour dans l'arrêt *Nation Haïda*.

[62] Qu'un tribunal administratif doive s'en tenir à l'exercice de ses pouvoirs légaux et ne faire porter son analyse et ses décisions que sur les questions particulières dont il est saisi comporte certes le risque qu'un gouvernement se soustraie de fait à l'obligation de consulter en limitant le mandat d'un tribunal administratif. On peut craindre en effet qu'en privant un tribunal administratif du pouvoir d'examiner les questions relatives à la consultation ou en répartissant le pouvoir de statuer en la matière entre plusieurs tribunaux administratifs de manière qu'aucun d'eux ne puisse se pencher sur l'obligation de consulter que font naître certaines mesures gouvernementales, le gouvernement se soustraie de fait à cette obligation.

[63] Comme le conclut à juste titre la Cour d'appel, l'obligation de consulter les peuples autochtones, qui naît lorsque le gouvernement prend une décision susceptible d'avoir un effet préjudiciable sur leurs intérêts, est une obligation constitutionnelle qui fait intervenir l'honneur de la Couronne et qui doit être respectée. Si le régime administratif mis en place par le législateur ne peut remédier aux éventuels effets préjudiciables d'une décision sur des intérêts autochtones, les Premières nations touchées doivent alors s'adresser à une cour de justice pour obtenir la réparation voulue : *Nation Haïda*, par. 51.

[64] Avant de passer au volet suivant de l'analyse, il me paraît indiqué de préciser quelle norme de contrôle s'applique à la décision du tribunal administratif. Prenons comme point de départ le par. 61 de l'arrêt *Nation Haïda* :

L'existence et l'étendue de l'obligation de consulter ou d'accommoder sont des questions de droit en ce sens qu'elles définissent une obligation légale. Cependant, la réponse à ces questions repose habituellement sur l'appréciation des faits. Il se peut donc qu'il convienne de faire preuve de déférence à l'égard des conclusions de fait du premier décideur. [ . . . ] En l'absence d'erreur sur des questions de droit, il est possible que le tribunal

deference may be required. In such a case, the standard of review is likely to be reasonableness. To the extent that the issue is one of pure law, and can be isolated from the issues of fact, the standard is correctness. However, where the two are inextricably entwined, the standard will likely be reasonableness . . . .

[65] It is therefore clear that some deference is appropriate on matters of mixed fact and law, invoking the standard of reasonableness. This, of course, does not displace the need to take express legislative intention into account in determining the appropriate standard of review on particular issues: *Canada (Citizenship and Immigration) v. Khosa*, 2009 SCC 12, [2009] 1 S.C.R. 339. It follows that it is necessary in this case to consider the provisions of the *Administrative Tribunals Act* and the *Utilities Commission Act* in determining the appropriate standard of review, as will be discussed more fully below.

### C. *The Commission's Jurisdiction to Consider Consultation*

[66] Having considered the law governing when a duty to consult arises and the role of tribunals in relation to the duty to consult, I return to the questions at issue on appeal.

[67] The first question is whether consideration of the duty to consult was within the mandate of the Commission. This being an issue of jurisdiction, the standard of review at common law is correctness. The relevant statutes, discussed earlier, do not displace that standard. I therefore agree with the Court of Appeal that the Commission did not err in concluding that it had the power to consider the issue of consultation.

[68] As discussed above, issues of consultation between the Crown and Aboriginal groups arise from s. 35 of the *Constitution Act, 1982*. They therefore have a constitutional dimension. The question is whether the Commission possessed the power to

administratif soit mieux placé que le tribunal de révision pour étudier la question, auquel cas une certaine déférence peut s'imposer. Dans ce cas, la norme de contrôle applicable est vraisemblablement la norme de la décision raisonnable. Dans la mesure où la question est une question de droit pur et peut être isolée des questions de fait, la norme applicable est celle de la décision correcte. Toutefois, lorsque les deux types de questions sont inextricablement liées entre elles, la norme de contrôle applicable est vraisemblablement celle de la décision raisonnable . . . .

[65] Il est donc clair qu'une certaine déférence s'impose à l'égard d'une décision sur une question mixte de fait et de droit, d'où l'application de la norme de la raisonabilité. Ce qui n'écarterait évidemment pas la nécessité de tenir compte de l'intention expresse du législateur pour déterminer la norme de contrôle qu'il convient d'appliquer dans un cas donné : *Canada (Citoyenneté et Immigration) c. Khosa*, 2009 CSC 12, [2009] 1 R.C.S. 339. Il faut donc, en l'espèce, considérer les dispositions de l'*Administrative Tribunals Act* et de la *Utilities Commission Act* pour arrêter la bonne norme de contrôle, ce dont il est question plus en détail ci-après.

### C. *Le pouvoir de la Commission de se pencher sur la consultation*

[66] Après examen du droit régissant l'existence de l'obligation de consulter et le rôle du tribunal administratif relativement à celle-ci, je reviens sur les questions en litige dans le pourvoi.

[67] D'abord, l'examen de l'obligation de consulter relevait-elle du mandat de la Commission? S'agissant d'une question de compétence, la norme de contrôle est, en common law, celle de la décision correcte. Les lois applicables considérées précédemment n'écarteraient pas cette norme. Je conviens donc avec la Cour d'appel que la Commission n'a pas eu tort de conclure qu'elle avait le pouvoir de se pencher sur la question de la consultation.

[68] Rappelons que la consultation des peuples autochtones par la Couronne découle de l'art. 35 de la *Loi constitutionnelle de 1982*, de sorte qu'elle revêt une dimension constitutionnelle. Il faut déterminer si la Commission avait le pouvoir d'en faire

consider such an issue. As discussed, above, tribunals are confined to the powers conferred on them by the legislature: *Conway*. We must therefore ask whether the *Utilities Commission Act* conferred on the Commission the power to consider the issue of consultation, grounded as it is in the Constitution.

[69] It is common ground that the *Utilities Commission Act* empowers the Commission to decide questions of law in the course of determining whether the 2007 EPA is in the public interest. The power to decide questions of law implies a power to decide constitutional issues that are properly before it, absent a clear demonstration that the legislature intended to exclude such jurisdiction from the tribunal's power (*Conway*, at para. 81; *Paul v. British Columbia (Forest Appeals Commission)*, 2003 SCC 55, [2003] 2 S.C.R. 585, at para. 39). “[S]pecialized tribunals with both the expertise and authority to decide questions of law are in the best position to hear and decide constitutional questions related to their statutory mandates”: *Conway*, at para. 6.

[70] Beyond its general power to consider questions of law, the factors the Commission is required to consider under s. 71 of the *Utilities Commission Act*, while focused mainly on economic issues, are broad enough to include the issue of Crown consultation with Aboriginal groups. At the time, s. 71(2)(e) required the Commission to consider “any other factor that the commission considers relevant to the public interest”. The constitutional dimension of the duty to consult gives rise to a special public interest, surpassing the dominantly economic focus of the consultation under the *Utilities Commission Act*. As Donald J.A. asked, “How can a contract formed by a Crown agent in breach of a constitutional duty be in the public interest?” (para. 42).

[71] This conclusion is not altered by the *Administrative Tribunals Act*, which provides that a tribunal does not have jurisdiction over

un objet de son examen. Je le répète, un tribunal administratif doit s'en tenir à l'exercice des pouvoirs conférés par le législateur : arrêt *Conway*. Nous devons donc nous demander si la *Utilities Commission Act* reconnaissait à la Commission le pouvoir d'examiner la question de la consultation du fait de l'assise constitutionnelle de celle-ci.

[69] Il est reconnu que la *Utilities Commission Act* investit la Commission du pouvoir de trancher des questions de droit aux fins de déterminer si le CAÉ de 2007 sert l'intérêt public. Le pouvoir d'un tribunal administratif de statuer en droit emporte celui de trancher une question constitutionnelle dont il est régulièrement saisi, sauf lorsqu'il est clairement établi que le législateur a voulu le priver d'un tel pouvoir (*Conway*, par. 81; *Paul c. Colombie-Britannique (Forest Appeals Commission)*, 2003 CSC 55, [2003] 2 R.C.S. 585, par. 39). « [U]n tribunal spécialisé jouissant à la fois de l'expertise et du pouvoir requis pour trancher une question de droit est le mieux placé pour trancher une question constitutionnelle se rapportant à son mandat légal » : *Conway*, par. 6.

[70] Outre les questions de droit qu'elle a le pouvoir général d'examiner, les éléments dont la Commission doit tenir compte suivant l'art. 71 de la *Utilities Commission Act*, bien qu'ils soient surtout axés sur l'économie, sont suffisamment généraux pour englober la consultation des Autochtones par la Couronne. L'alinéa 71(2)(e) exigeait aussi de la Commission qu'elle tienne compte de [TRADUCTION] « tout autre élément jugé pertinent eu égard à l'intérêt public ». L'aspect constitutionnel de l'obligation de consulter fait naître un intérêt public spécial qui écarte la prédominance de l'angle économique dans la consultation prévue par la *Utilities Commission Act*. Comme le demande le juge Donald de la Cour d'appel, [TRADUCTION] « Comment un contrat conclu par un mandataire de la Couronne dans le non-respect d'une obligation constitutionnelle peut-il être dans l'intérêt public? » (par. 42).

[71] L'*Administrative Tribunals Act* de la Colombie-Britannique ne modifie pas cette conclusion même si elle prévoit qu'un tribunal administratif

constitutional matters. Section 2(4) of the *Utilities Commission Act* makes certain sections of the *Administrative Tribunals Act* applicable to the Commission. This includes s. 44(1) which provides that “[t]he tribunal does not have jurisdiction over constitutional questions.” However, “constitutional question” is defined narrowly in s. 1 of the *Administrative Tribunals Act* as “any question that requires notice to be given under section 8 of the *Constitutional Question Act*”. Notice is required only for challenges to the constitutional validity or constitutional applicability of any law, or are application for a constitutional remedy.

[72] The application to the Commission by the CSTC for a rescoping order to address consultation issues does not fall within this definition. It is not a challenge to the constitutional validity or applicability of a law, nor a claim for a constitutional remedy under s. 24 of the *Charter* or s. 52 of the *Constitution Act, 1982*. In broad terms, consultation under s. 35 of the *Constitution Act, 1982* is a constitutional question: *Paul*, para. 38. However, the provisions of the *Administrative Tribunals Act* and the *Constitutional Question Act* do not indicate a clear intention on the part of the legislature to exclude from the Commission’s jurisdiction the duty to consider whether the Crown has discharged its duty to consult with holders of relevant Aboriginal interests. It follows that, in applying the test articulated in *Paul* and *Conway*, the Commission has the constitutional jurisdiction to consider the adequacy of Crown consultation in relation to matters properly before it.

[73] For these reasons, I conclude that the Commission had the power to consider whether adequate consultation with concerned Aboriginal peoples had taken place.

[74] While the *Utilities Commission Act* conferred on the Commission the power to consider whether adequate consultation had taken place,

n’a pas compétence en matière constitutionnelle. Le paragraphe 2(4) de la *Utilities Commission Act* assujettit la Commission à certaines dispositions de l’*Administrative Tribunals Act*, dont le par. 44(1), qui dispose qu’[TRADUCTION] « [u]n tribunal administratif n’a pas compétence pour trancher une question constitutionnelle. » Or, le terme [TRADUCTION] « question constitutionnelle » est défini de manière stricte à l’article premier comme s’entendant de « toute question exigeant qu’un avis soit donnée en application de l’article 8 de la *Constitutional Question Act* ». L’avis n’est requis que lorsque la validité ou l’applicabilité constitutionnelle d’une loi est contestée ou qu’une réparation constitutionnelle est demandée.

[72] L’objet de la demande présentée à la Commission par le CTCS pour que le cadre de l’audience soit redéfini de manière à englober la question de la consultation ne correspond pas à cette définition. Il n’y avait ni contestation de la validité ou de l’applicabilité constitutionnelle d’une loi, ni demande de réparation fondée sur l’art. 24 de la *Charte* ou l’art. 52 de la *Loi constitutionnelle de 1982*. De manière générale, la consultation visée à l’art. 35 de la *Loi constitutionnelle de 1982* correspond à une question constitutionnelle : *Paul*, par. 38. Toutefois, l’intention du législateur de soustraire à la compétence de la Commission la question de savoir si la Couronne s’est acquittée de son obligation de consulter les titulaires des droits ancestraux en cause ne ressort ni de l’*Administrative Tribunals Act* ni de la *Constitutional Question Act*. Dès lors, suivant le critère dégagé dans les arrêts *Paul* et *Conway*, la Commission a compétence constitutionnelle pour se pencher sur le caractère adéquat de la consultation effectuée par la Couronne relativement aux questions dont elle est régulièrement saisie.

[73] C’est pourquoi j’estime que la Commission avait le pouvoir de déterminer si les peuples autochtones touchés avaient été convenablement consultés.

[74] Même si la *Utilities Commission Act* confère à la Commission le pouvoir de déterminer si une consultation adéquate a eu lieu, elle ne va pas jusqu’à

its language did not extend to empowering the Commission to engage in consultations in order to discharge the Crown's constitutional obligation to consult. As discussed above, legislatures may delegate the Crown's duty to consult to tribunals. However, the Legislature did not do so in the case of the Commission. Consultation itself is not a question of law, but a distinct constitutional process requiring powers to effect compromise and do whatever is necessary to achieve reconciliation of divergent Crown and Aboriginal interests. The Commission's power to consider questions of law and matters relevant to the public interest does not empower it to itself engage in consultation with Aboriginal groups.

[75] As the Court of Appeal rightly found, the duty to consult with Aboriginal groups, triggered when government decisions have the potential to adversely affect Aboriginal interests, is a constitutional duty invoking the honour of the Crown. It must be met. If the tribunal structure set up by the Legislature is incapable of dealing with a decision's potential adverse impacts on Aboriginal interests, then the Aboriginal peoples affected must seek appropriate remedies in the courts: *Haida Nation*, at para. 51.

#### D. *The Commission's Reconsideration Decision*

[76] The Commission correctly accepted that it had the power to consider the adequacy of consultation with Aboriginal groups. The reason it decided it would not consider this issue was not for want of power, but because it concluded that the consultation issue could not arise, given its finding that the 2007 EPA would not adversely affect any Aboriginal interest.

[77] As reviewed earlier in these reasons, the Commission held a hearing into the issue of whether the main hearing should be rescoped to permit exploration of the consultation issue. The evidence at this hearing was directed to the issue

l'autoriser à entreprendre elle-même la consultation et à s'acquitter de l'obligation constitutionnelle de la Couronne. Je rappelle que le législateur peut déléguer à un tribunal administratif l'obligation de la Couronne de consulter. Toutefois, en l'espèce, il ne l'a pas fait vis-à-vis de la Commission. La consultation ne constitue pas comme telle une question de droit, mais une démarche constitutionnelle distincte exigeant le pouvoir de transiger et d'accomplir tout ce qui est nécessaire pour concilier les intérêts divergents de la Couronne et des Autochtones. Le pouvoir de la Commission d'examiner les questions de droit et tout élément pertinent pour ce qui concerne l'intérêt public ne l'autorise pas à entreprendre elle-même la consultation des groupes autochtones.

[75] Comme le conclut à juste titre la Cour d'appel, l'obligation de consulter les peuples autochtones, qui naît lorsque le gouvernement prend une décision susceptible d'avoir un effet préjudiciable sur leurs intérêts, est une obligation constitutionnelle qui fait intervenir l'honneur de la Couronne et qui doit être respectée. Lorsque le régime administratif mis en place par le législateur ne peut remédier aux éventuels effets préjudiciables d'une décision sur des intérêts autochtones, les Premières nations touchées doivent s'adresser à une cour de justice pour obtenir la réparation voulue : *Nation Haïda*, par. 51.

#### D. *La décision de la Commission sur la demande de révision*

[76] La Commission a reconnu à juste titre avoir le pouvoir d'examiner le caractère adéquat de la consultation des groupes autochtones. Elle a décidé de ne pas se pencher sur la question non pas parce qu'elle n'en avait pas le pouvoir, mais parce qu'elle estimait que la question ne pouvait se poser étant donné sa conclusion que le CAÉ de 2007 n'aurait pas d'effet préjudiciable sur quelque intérêt autochtone.

[77] Comme nous l'avons vu, la Commission a tenu une audience sur la question de savoir s'il fallait recadrer l'audience principale de manière à permettre l'examen de la question de la consultation. La preuve alors produite portait sur l'effet

of whether approval of the 2007 EPA would have any adverse impact on the interests of the CSTC First Nations. The Commission considered both the impact of the 2007 EPA on river levels (physical impact) and on the management and control of the resource. The Commission concluded that the 2007 EPA would not have any adverse physical impact on the Nechako River and its fishery. It also concluded that the 2007 EPA did not “transfer or change control of licenses or authorization”, negating adverse impacts from management or control changes. The Commission held that an underlying infringement (i.e. failure to consult on the initial project) was not sufficient to trigger a duty to consult. It therefore dismissed the application for reconsideration and declined to rescope the hearing to include consultation issues.

[78] The determination that rescoping was not required because the 2007 EPA could not affect Aboriginal interests is a mixed question of fact and law. As directed by *Haida Nation*, the standard of review applicable to this type of decision is normally reasonableness (understood in the sense that any conclusion resting on incorrect legal principles of law would not be reasonable). However, the provisions of the relevant statutes, discussed earlier, must be considered. The *Utilities Commission Act* provides that the Commission’s findings of fact are “binding and conclusive”, attracting a patently unreasonable standard under the *Administrative Tribunals Act*. Questions of law must be correctly decided. The question before us is a question of mixed fact and law. It falls between the legislated standards and thus attracts the common law standard of “reasonableness” as set out in *Haida Nation* and *Dunsmuir v. New Brunswick*, 2008 SCC 9, [2008] 1 S.C.R. 190.

[79] A duty to consult arises, as set out above, when there is: (a) knowledge, actual or constructive, by the Crown of a potential Aboriginal claim or right, (b) contemplated Crown conduct, and (c) the potential that the contemplated conduct may

préjudiciable éventuel de l’approbation du CAÉ de 2007 sur les intérêts des Premières nations du CTCS. La Commission a examiné l’effet du CAÉ de 2007 tant sur les niveaux d’eau (impact physique) que sur la gestion de la ressource et sa maîtrise. Elle a conclu que le CAÉ de 2007 n’aurait aucun impact physique négatif sur la rivière Nechako et ses ressources halieutiques. Elle a aussi estimé que le CAÉ de 2007 n’entraînerait [TRADUCTION] « ni transfert ni modification des licences ou des autorisations », écartant du coup tout effet préjudiciable causé par une modification touchant à la gestion ou à la maîtrise. Selon elle, une atteinte sous-jacente (soit l’omission de consulter relativement au projet initial) ne suffisait pas pour faire naître une obligation de consulter. Elle a donc rejeté la demande de révision et refusé de recadrer l’audience de manière que celle-ci porte aussi sur la consultation.

[78] La décision selon laquelle le recadrage n’était pas nécessaire parce que le CAÉ de 2007 ne pouvait avoir d’incidence sur des intérêts autochtones porte sur une question mixte de fait et de droit. Suivant l’arrêt *Nation Haïda*, la norme de contrôle applicable à ce genre de décision est habituellement celle de la raisonnable (au sens où toute conclusion fondée sur un principe de droit erroné n’est pas raisonnable). Cependant, il faut tenir compte des dispositions des lois applicables examinées précédemment. La *Utilities Commission Act* prévoit que les conclusions de fait de la Commission sont [TRADUCTION] « opposables et définitives », ce qui appelle la norme de la décision manifestement déraisonnable suivant l’*Administrative Tribunals Act*. La décision portant sur une question de droit doit être correcte. Or, la question dont nous sommes saisis est une question mixte de fait et de droit. Elle appelle une norme se situant entre celles établies par la loi, à savoir la norme de la raisonnable, issue de la common law et consacrée par les arrêts *Nation Haïda* et *Dunsmuir c. Nouveau-Brunswick*, 2008 CSC 9, [2008] 1 R.C.S. 190.

[79] Rappelons que l’obligation de consulter prend naissance lorsque les éléments suivants sont réunis : a) connaissance par la Couronne, réelle ou imputée, de l’existence possible d’une revendication autochtone ou d’un droit ancestral, b) mesure

adversely affect the Aboriginal claim or right. If, in applying the test set out in *Haida Nation*, it is arguable that a duty to consult could arise, the Commission would have been wrong to dismiss the rescoping order.

[80] The first element of the duty to consult — Crown knowledge of a potential Aboriginal claim or right — need not detain us. The CSTC First Nations' claims were well-known to the Crown; indeed, it was lodged in the Province's formal claims resolution process.

[81] Nor need the second element — proposed Crown conduct or decision — detain us. BC Hydro's proposal to enter into an agreement to purchase electricity from Alcan is clearly proposed Crown conduct. BC Hydro is a Crown corporation. It acts in place of the Crown. No one seriously argues that the 2007 EPA does not represent a proposed action of the Province of British Columbia.

[82] The third element — adverse impact on an Aboriginal claim or right caused by the Crown conduct — presents greater difficulty. The Commission, referring to *Haida Nation*, took the view that to meet the adverse impact requirement, "more than just an underlying infringement" was required. In other words, it must be shown that the 2007 EPA could "adversely affect" a current Aboriginal interest. The Court of Appeal rejected, or must be taken to have rejected, the Commission's view of the matter.

[83] In my view, the Commission was correct in concluding that an underlying infringement in and of itself would not constitute an adverse impact giving rise to a duty to consult. As discussed above, the constitutional foundation of consultation articulated in *Haida Nation* is the potential for adverse impacts on Aboriginal interests of state-authorized

projetée par la Couronne et c) risque que celle-ci ait un effet préjudiciable sur la revendication ou le droit. Si, au regard du critère établi dans l'arrêt *Nation Haïda*, on peut soutenir qu'une obligation de consulter pouvait exister, la Commission a eu tort de rejeter la demande de recadrage de l'audience.

[80] Il n'y a pas lieu de s'arrêter au premier élément — la connaissance par la Couronne de l'existence possible d'une revendication autochtone ou d'un droit ancestral. Les revendications des Premières nations du CTCS étaient bien connues de la Couronne et avaient en fait été formulées dans le cadre du processus formel mis sur pied par la province pour le règlement des revendications autochtones.

[81] Il n'y a pas lieu non plus de s'attarder au deuxième élément — la mesure ou la décision projetée par la Couronne. Le projet de BC Hydro de conclure avec Alcan un contrat d'achat d'électricité constitue clairement une mesure projetée par la Couronne. BC Hydro est une société d'État qui agit au nom de la Couronne. Nul ne prétend sérieusement que le CAÉ de 2007 n'équivaut pas à une mesure projetée par la province de la Colombie-Britannique.

[82] Le troisième élément — l'effet préjudiciable de la mesure de la Couronne sur une revendication autochtone ou un droit ancestral — présente une plus grande difficulté. S'appuyant sur l'arrêt *Nation Haïda*, la Commission a estimé que pour satisfaire à l'exigence de l'effet préjudiciable, il fallait [TRADUCTION] « davantage qu'une atteinte sous-jacente ». En d'autres termes, il fallait démontrer que le CAÉ de 2007 était susceptible d'avoir un « effet préjudiciable » sur un intérêt autochtone actuel. La Cour d'appel rejette le point de vue de la Commission sur ce point, ou c'est du moins ce qu'il faut retenir de sa décision.

[83] À mon sens, la Commission a eu raison de conclure qu'une atteinte sous-jacente ne constitue pas comme telle un effet préjudiciable faisant naître une obligation de consulter. Nous l'avons vu, il appert de l'arrêt *Nation Haïda* que le fondement constitutionnel de la consultation réside dans le risque qu'un projet autorisé par l'État ait

developments. Consultation centres on how the resource is to be developed in a way that prevents irreversible harm to existing Aboriginal interests. Both parties must meet in good faith, in a balanced manner that reflects the honour of the Crown, to discuss development with a view to accommodation of the conflicting interests. Such a conversation is impossible where the resource has long since been altered and the present government conduct or decision does not have any further impact on the resource. The issue then is not consultation about the further development of the resource, but negotiation about compensation for its alteration without having properly consulted in the past. The Commission applied the correct legal test.

[84] It was argued that the Crown breached the rights of the CSTC when it allowed the Kenney Dam and electricity production powerhouse with their attendant impacts on the Nechako River to be built in the 1950s and that this breach is ongoing and shows no sign of ceasing in the foreseeable future. But the issue before the Commission was whether a fresh duty to consult could arise *with respect to the Crown decision before the Commission*. The question was whether the 2007 EPA could *adversely* impact the claim or rights advanced by the CSTC First Nations in the ongoing claims process. The issue of ongoing and continuing breach was not before the Commission, given its limited mandate, and is therefore not before this Court.

[85] What then is the potential impact of the 2007 EPA on the claims of the CSTC First Nations? The Commission held there could be none. The question is whether this conclusion was reasonable based on the evidence before the Commission on the rescoping inquiry.

[86] The Commission considered two types of potential impacts. The first type of impact was the

un effet préjudiciable sur des intérêts autochtones. La consultation porte principalement sur la façon dont la ressource doit être exploitée pour qu'un préjudice irréparable ne soit pas infligé aux intérêts autochtones existants. Les deux parties doivent se rencontrer de bonne foi, dans un climat de mesure compatible avec l'honneur de la Couronne, pour discuter de mise en valeur dans une optique de conciliation des intérêts divergents. Or, un tel échange est impossible lorsque la ressource est transformée depuis longtemps et que la mesure ou la décision actuelle du gouvernement n'a plus aucune incidence sur elle. Il ne s'agit plus dès lors de consulter sur l'exploitation ultérieure de la ressource, mais plutôt de négocier une indemnisation pour sa transformation intervenue sans consultation adéquate préalable. La Commission a appliqué le bon critère juridique.

[84] Le CTCS fait valoir que la Couronne a porté atteinte à ses droits lorsque, dans les années 1950, elle a autorisé la construction du barrage Kenney et de la centrale électrique, qui a eu des répercussions sur la rivière Nechako, et que cette atteinte est continue et que rien ne permet de croire qu'elle cessera dans un avenir prévisible. Cependant, la question que devait trancher la Commission était celle de savoir si une nouvelle obligation de consulter pouvait prendre naissance à l'égard de la *décision de la Couronne dont était saisie la Commission*. Il lui fallait déterminer si le CAÉ de 2007 pouvait avoir un effet *préjudiciable* sur les droits revendiqués par les Premières nations du CTCS dans le cadre du processus de règlement en cours. Étant donné les limites de son mandat, la Commission n'était pas saisie de la question de l'atteinte continue et se poursuivant toujours, en sorte que notre Cour ne l'est pas non plus.

[85] Quel est donc l'impact possible du CAÉ de 2007 sur les revendications des Premières nations du CTCS? La Commission a conclu qu'il ne pouvait y en avoir. La question est donc celle de savoir si la conclusion était raisonnable au vu de la preuve offerte à l'appui de la demande de recadrage.

[86] La Commission a considéré deux types d'effet possible. Le premier était l'impact physique du



physical impact of the 2007 EPA on the Nechako River and thus on the fishery. The Commission conducted a detailed review of the evidence on the impact the 2007 EPA could have on the river's water levels and concluded it would have none. This was because the levels of water on the river were entirely governed by the water licence and the 1987 agreement between the Province, Canada, and Alcan. The Commission rejected the argument that not approving the 2007 EPA could potentially raise water levels in the Nechako River, to the benefit of the fishery, on the basis of uncontradicted evidence that if Alcan could not sell its excess electricity to BC Hydro it would sell it elsewhere. The Commission concluded that with or without the 2007 EPA, "Alcan operates the Nechako Reservoir to optimize power generation". Finally, the Commission concluded that changes in the timing of water releases for power generation have no effect on water levels in the Nechako River because water releases for power generation flow into the Kemano River to the west, rather than the Nechako River to the east.

[87] The Commission also considered whether the 2007 EPA might bring about organizational, policy, or managerial changes that might adversely affect the claims or rights of the CSTC First Nations. As discussed above, a duty to consult may arise not only with respect to specific physical impacts, but with respect to high-level managerial or policy decisions that may potentially affect the future exploitation of a resource to the detriment of Aboriginal claimants. It noted that a "section 71 review does not approve, transfer or change control of licenses or authorization". Approval of the 2007 EPA would not effect management changes, ruling out any attendant adverse impact. This, plus the absence of physical impact, led the Commission to conclude that the 2007 EPA had no potential to adversely impact on Aboriginal interests.

CAÉ de 2007 sur la rivière Nechako et, par conséquent, sur le poisson. La Commission a examiné minutieusement les éléments de preuve sur les effets que le CAÉ de 2007 pouvait avoir sur les niveaux d'eau de la rivière et elle a conclu qu'il n'y en aurait pas. En fait, les niveaux d'eau de la rivière relevaient entièrement du permis d'exploitation hydraulique et de l'accord de 1987 intervenu entre la province, le Canada et Alcan. La Commission a rejeté l'argument voulant que l'omission d'approuver le CAÉ de 2007 puisse entraîner une augmentation des niveaux d'eau de la rivière Nechako, et favoriser ainsi la pêche, eu égard à la preuve non contredite selon laquelle si Alcan ne pouvait vendre ses surplus d'électricité à BC Hydro, elle trouverait un autre preneur. Elle a conclu qu'avec ou sans le CAÉ de 2007, [TRADUCTION] « Alcan exploite le réservoir Nechako dans le but d'optimiser la production d'énergie ». Enfin, la Commission a conclu que la modification du calendrier des lâchers d'eau destinés à la production d'électricité n'avait aucun impact sur les niveaux d'eau de la rivière Nechako puisque l'eau était déversée dans la rivière Kemano à l'ouest, et non dans la Nechako à l'est.

[87] La Commission s'est aussi penchée sur la question de savoir si le CAÉ de 2007 pouvait entraîner des changements organisationnels, politiques ou de gestion susceptibles d'avoir un effet préjudiciable sur les revendications ou les droits des Premières nations du CTCS. Je le répète, il peut y avoir obligation de consulter à l'égard non seulement d'impacts physiques particuliers, mais aussi de décisions de gestion ou politiques qui sont prises en haut lieu et qui peuvent avoir une incidence sur l'exploitation future de la ressource au détriment des demandeurs autochtones. La Commission fait remarquer que l'[TRADUCTION] « examen visé à l'art. 71 n'a pas pour effet d'approuver ou de transférer une licence ou une autorisation ou d'en modifier le titulaire ». L'approbation du CAÉ de 2007 n'allait pas entraîner de changements de gestion, ce qui écartait tout effet préjudiciable concomitant. Ces éléments, joints à l'absence d'impact physique, ont amené la Commission à conclure que le CAÉ de 2007 ne risquait pas d'avoir un effet préjudiciable sur des intérêts autochtones.

[88] It is necessary, however, to delve further. The 2007 EPA calls for the creation of a Joint Operating Committee, with representatives of Alcan and BC Hydro (s. 4.13). The duties of the committee are to provide advice to the parties regarding the administration of the 2007 EPA and to perform other functions that may be specified or that the parties may direct (s. 4.14). The 2007 EPA also provides that the parties will jointly develop, maintain, and update a reservoir operating model based on Alcan's existing operating model and "using input data acceptable to both Parties, acting reasonably" (s. 4.17).

[89] The question is whether these clauses amount to an authorization of organizational changes that have the potential to adversely impact on Aboriginal interests. Clearly the Commission did not think so. But our task is to examine that conclusion and ask whether this view of the Commission was reasonable, bearing in mind the generous approach that should be taken to the duty to consult, grounded in the honour of the Crown.

[90] Assuming that the creation of the Joint Operating Committee and the ongoing reservoir operation plan can be viewed as organizational changes effected by the 2007 EPA, the question is whether they have the potential to adversely impact the claims or rights of the CSTC First Nations. In cases where adverse impact giving rise to a duty to consult has been found as a consequence of organizational or power-structure changes, it has generally been on the basis that the operational decision at stake may affect the Crown's future ability to deal honourably with Aboriginal interests. Thus, in *Haida Nation*, the Crown proposed to enter into a long-term timber sale contract with Weyerhaeuser. By entering into the contract, the Crown would have reduced its power to control logging of trees, some of them old growth forest, and hence its ability to exercise decision making over the forest consistent with the honour of the Crown. The resource would have been harvested without the consultation discharge that the honour of the Crown required. The Haida people would have been robbed of their

[88] Il est toutefois nécessaire de pousser quelque peu l'analyse. Le CAÉ de 2007 prévoit la création d'un comité conjoint d'exploitation formé de représentants d'Alcan et de BC Hydro (clause 4.13). Le comité a pour fonction de conseiller les parties sur l'administration du CAÉ de 2007 et d'accomplir d'autres tâches qui sont précisées ou que lui assignent les parties (clause 4.14). Le CAÉ de 2007 prévoit aussi que, conjointement, les parties élaborent, appliquent et actualisent un modèle d'exploitation du réservoir inspiré de celui d'Alcan et [TRADUCTION] « utilisant des données jugées acceptables par les deux parties, qui sont tenues de se montrer raisonnables » (clause 4.17).

[89] La question est celle de savoir si ces clauses équivalent à autoriser des modifications d'ordre organisationnel qui sont susceptibles d'avoir un effet préjudiciable sur des intérêts autochtones. La Commission ne le croit manifestement pas. Or, il nous faut examiner cette conclusion et nous demander si elle est raisonnable eu égard à l'approche généreuse qui s'impose relativement à l'obligation de consulter, laquelle a pour assise l'honneur de la Couronne.

[90] À supposer que la création du comité conjoint et du modèle d'exploitation du réservoir existant puissent être considérés comme des modifications d'ordre organisationnel apportées par le CAÉ de 2007, la question est celle de savoir si ces dernières sont susceptibles d'avoir un effet préjudiciable sur les revendications ou les droits des Premières nations du CTCS. Lorsqu'il est établi que l'effet préjudiciable faisant naître l'obligation de consulter résulte d'une modification de l'organisation, notamment celle du pouvoir, c'est généralement parce que la décision opérationnelle en cause risque dès lors d'empêcher la Couronne d'agir honorablement à l'égard des intérêts autochtones. Ainsi, dans l'affaire *Nation Haïda*, la Couronne projetait la conclusion avec Weyerhaeuser d'un contrat à long terme de vente de bois d'œuvre. En concluant le contrat, la Couronne réduisait sa maîtrise de l'exploitation forestière, notamment dans certaines vieilles forêts, et, partant, sa faculté d'exercer son pouvoir décisionnel en la matière de façon conforme à l'honneur de la Couronne. La ressource aurait été

constitutional entitlement. A more telling adverse impact on Aboriginal interests is difficult to conceive.

[91] By contrast, in this case, the Crown remains present on the Joint Operating Committee and as a participant in the reservoir operating model. Charged with the duty to act in accordance with the honour of Crown, BC Hydro's representatives would be required to take into account and consult as necessary with affected Aboriginal groups insofar as any decisions taken in the future have the potential to adversely affect them. The CSTC First Nations' right to Crown consultation on any decisions that would adversely affect their claims or rights would be maintained. I add that the honour of the Crown would require BC Hydro to give the CSTC First Nations notice of any decisions under the 2007 EPA that have the potential to adversely affect their claims or rights.

[92] This ongoing right to consultation on future changes capable of adversely impacting Aboriginal rights does not undermine the validity of the Commission's decision on the narrow issue before it: whether approval of the 2007 EPA could have an adverse impact on claims or rights of the CSTC First Nations. The Commission correctly answered that question in the negative. The uncontradicted evidence established that Alcan would continue to produce electricity at the same rates *regardless of whether the 2007 EPA is approved or not*, and that Alcan will sell its power elsewhere if BC Hydro does not buy it, as is their entitlement under Final Water Licence No. 102324 and the 1987 Agreement on waterflows. Moreover, although the Commission did not advert to it, BC Hydro, as a participant on the Joint Operating Committee and the reservoir management team, must in the future consult with the CSTC First Nations on any decisions that may adversely impact their claims or rights. On this evidence, it was not unreasonable for the Commission to conclude that the 2007 EPA will not adversely affect the claims and rights

exploitée sans que la Couronne ne se soit acquittée au préalable de l'obligation de consulter que commande l'honneur de la Couronne. Le peuple Haïda aurait été dépouillé de son droit constitutionnel. Difficile de concevoir un effet préjudiciable plus manifeste sur un intérêt autochtone.

[91] En l'espèce, par contre, la Couronne demeure un membre du comité conjoint d'exploitation et un participant en ce qui concerne le modèle d'exploitation du réservoir. Comme ils ont l'obligation d'agir conformément à l'honneur de la Couronne, les représentants de BC Hydro devront tenir compte des groupes autochtones touchés et les consulter au besoin lorsqu'une décision ultérieure sera susceptible d'avoir un effet préjudiciable sur eux. Le droit des Premières nations du CTCS d'être consultées sur toute décision susceptible de compromettre leurs revendications ou leurs droits est préservé. J'ajoute que l'honneur de la Couronne oblige BC Hydro à les informer de toute décision prise en application du CAÉ de 2007 qui est susceptible d'avoir un effet préjudiciable sur leurs revendications ou leurs droits.

[92] Ce droit permanent qu'ont les Premières nations du CTCS d'être consultées pour toute modification ultérieure susceptible d'avoir un effet préjudiciable sur leurs droits ancestraux ne remet pas en cause le bien-fondé de la décision rendue par la Commission relativement à la seule question dont elle était saisie : l'approbation du CAÉ de 2007 pouvait-elle avoir un effet préjudiciable sur leurs revendications ou leurs droits? La Commission a eu raison de répondre par la négative. La preuve non contredite établissait qu'Alcan continuerait de produire la même quantité d'électricité, *que le CAÉ de 2007 soit approuvé ou non*, et qu'elle trouverait un autre acheteur si BC Hydro déclinait l'offre, comme l'y autorisaient le permis d'exploitation hydraulique permanent n° 102324 et l'accord de 1987 sur les niveaux d'eau. De plus, bien que la Commission n'en fasse pas mention, BC Hydro, en tant que membre du comité conjoint d'exploitation et de l'équipe de gestion du réservoir, doit dorénavant consulter les Premières nations du CTCS sur toute décision susceptible d'avoir un effet préjudiciable sur leurs revendications ou leurs droits. À la

currently under negotiation of the CSTC First Nations.

[93] I conclude that the Commission took a correct view of the law on the duty to consult and hence on the question before it on the application for reconsideration. It correctly identified the main issue before it as whether the 2007 EPA had the potential to adversely affect the claims and rights of the CSTC First Nations. It then examined the evidence on this question. It looked at the organizational implications of the 2007 EPA and at the physical changes it might bring about. It concluded that these did not have the potential to adversely impact the claims or rights of the CSTC First Nations. It has not been established that the Commission acted unreasonably in arriving at these conclusions.

E. *The Commission's Decision That Approval of the 2007 EPA Was in the Public Interest*

[94] The attack on the Commission's decision to approve the 2007 EPA was confined to the Commission's failure to consider the issue of adequate consultation over the affected interests of the CSTC First Nations. The conclusion that the Commission did not err in rejecting the application to consider this matter removes this objection. It follows that the argument that the Commission acted unreasonably in approving the 2007 EPA fails.

V. Disposition

[95] I would allow the appeal and confirm the decision of the British Columbia Utilities Commission approving the 2007 EPA. Each party will bear their costs.

*Appeal allowed; British Columbia Utilities Commission's approval of 2007 Energy Purchase Agreement confirmed.*

lumière de cette preuve, il n'est pas déraisonnable que la Commission conclue que le CAÉ de 2007 n'aura pas d'effet préjudiciable sur les revendications et les droits de ces Premières nations qui faisaient alors l'objet de négociations.

[93] J'arrive à la conclusion que la Commission a bien interprété le droit en ce qui concerne l'obligation de consulter et, par conséquent, la question qu'elle était appelée à trancher pour statuer sur la demande de révision. Elle a bien cerné la question principale dont elle était saisie, à savoir si le CAÉ de 2007 pouvait avoir un effet préjudiciable sur les revendications et les droits des Premières nations du CTCS. Elle a ensuite examiné la preuve pertinente. Elle a considéré les répercussions organisationnelles du CAÉ de 2007 et les changements physiques qui pouvaient en résulter. Elle a conclu que ces modifications ne risquaient pas de compromettre les revendications ou les droits en cause. Il n'a pas été établi qu'elle a agi de manière déraisonnable en tirant ces conclusions.

E. *La décision de la Commission portant que l'approbation du CAÉ de 2007 était dans l'intérêt public*

[94] Le seul motif de contestation de la décision d'approuver le CAÉ de 2007 était l'omission de la Commission d'examiner la question du caractère adéquat de la consultation portant sur les intérêts en cause des Premières nations du CTCS. La conclusion que la Commission n'a pas eu tort de rejeter la demande d'examen de cette question écarte ce motif de contestation. Ainsi, la thèse selon laquelle la Commission a agi de manière déraisonnable en approuvant le CAÉ de 2007 ne saurait être retenue.

V. Dispositif

[95] Je suis d'avis d'accueillir le pourvoi et de confirmer la décision de la Commission approuvant le CAÉ de 2007. Chacune des parties paie ses propres frais de justice.

*Pourvoi accueilli; décision de la British Columbia Utilities Commission approuvant le contrat d'achat d'électricité de 2007 confirmée.*

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