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British Columbia Utilities Commission
Sixth Floor, 900 Howe Street
Vancouver, BC V6Z 2N3

Attention: Erica M. Hamilton,
Commission Secretary

Dear Sirs/Mesdames:

Re: Terasen Gas Inc.
An Application by Terasen Gas Inc. for a Certificate of Public Convenience and Necessity for the Fraser River Crossing Upgrade Project

We enclose Submissions on behalf of Terasen Gas Inc. in respect of the above mentioned matter. We advise that twenty hard copies of same will follow by courier.

Yours truly,

FASKEN MARTINEAU DuMOULIN LLP

[Original signed by Matthew Ghikas]

Matthew Ghikas

MTG/fxm
Enc

IN THE MATTER OF
THE UTILITIES COMMISSION ACT, R.S.B.C. 1996, CHAPTER 473

AND

AN APPLICATION BY TERASEN GAS INC.
FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE
FRASER RIVER CROSSING UPGRADE PROJECT

SUBMISSIONS OF TERASEN GAS INC.

JANUARY 28, 2009

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I. INTRODUCTION

1. This is an application by Terasen Gas Inc. ("TGI" or the "Company") to the British Columbia Utilities Commission (the "Commission") pursuant to section 45 of the *Utilities Commission Act*, R.S.B.C. 1996, Chapter 473, (the "Act") for a Certificate of Public Convenience and Necessity ("CPCN") to upgrade the transmission pipeline system crossing the south arm of the Fraser River (the "Project"). In particular, TGI seeks the Commission's approval to replace an existing Nominal Pipe Size ("NPS") 20 pipeline and an existing NPS 24 pipeline with new pipelines of the same pipe size, each to be approximately 1400 meters long and both to be installed across the south arm of the Fraser River using Horizontal Directional Drill ("HDD") technology.[1] The Project is described in detail in Section 2 of the Application, Exhibit B-1.

2. The existing NPS 20 and NPS 24 natural gas transmission pipelines, which cross beneath the south arm of the Fraser River between Delta and Richmond approximately 5 km east of the George Massey Tunnel, were installed in 1958 and 1974, respectively.[2] The pipeline

[1] Exhibit B-1, at 1
[2] Exhibit B-1, at 6.

crossings are integral to the provision of natural gas to Richmond, Vancouver, North Vancouver City and District, West Vancouver and parts of Burnaby. They serve approximately 200,000 customers under design conditions.[3] The technical evidence in this proceeding demonstrates that the existing crossings do not currently meet TGI's seismic criteria and are likely to fail in a significant seismic event, and are vulnerable to river erosion and dike settlement. The severe repercussions from a pipeline failure for customers served by these crossings, and from a safety perspective, are significant. TGI submits that the evidence supports its analysis that the recommended Alternative to address the identified system reliability issues is appropriate and cost-effective.[4] The Project is in the public interest and necessity.

3. These submissions generally follow the framework of the Application.

II. PROJECT JUSTIFICATION

4. As detailed in Section 4 of the Application, the Project will address three major threats to the integrity of the existing crossings -- seismic vulnerability, river erosion, and dike settlement. The Company submits that, given the severe consequences in the event of a failure of the crossings, remedial action to help ensure reliable gas supply to a significant portion of the Lower Mainland is in the public convenience and necessity.

a. Vulnerability Concerns

5. The pipelines do not currently meet TGI's seismic design criteria. In accordance with the Canadian Pipeline System Standard CSA Z662, which requires pipeline designers to determine whether supplemental design criteria are necessary, TGI selected the seismic design criterion of a 2,475 year return period event for this crossing. TGI is of the view that for most critical lifeline systems, a return period of 2,475 years for design seismic ground motions is quite

[3] Exhibit B-1, at 6, 11; Exhibit B-2, Response to BCUC IR No. 1.1.8. When discussing the consequence of a pipeline failure, the Application states on page 11 that the figure of 117,000 TGI customers would be affected based on typical, above-freezing winter weather, representing approximately 50% of system design load. In fact, the number of customer accounts affected would increase to 200,000 under design conditions. These estimates are based on the numbers of customers at present, and would increase over time as new customers are added to the system.

[4] Exhibit B-1, at 8-12; see also Exhibit B-2, Response to BCUC IR No. 1.6.3.

typical.[5] It is also consistent with local utility practices, US guidelines for major lifeline infrastructure, and the NBCC design criterion for life safety of inhabited structures.[6]

6. A significant amount of work has been done since the early 1990s to assess the reliability of the crossings.[7] Recent studies commissioned by the Company have confirmed the seismic vulnerability of the pipelines. Using 4th generation seismic hazard maps, acquiring additional soils information and conducting further modeling of both pipelines, Golder Associates reported in June 2008 that both pipelines were vulnerable to ground movement from seismic induced soil liquefaction and lateral spread, which would likely leave the existing pipelines unsupported and lead to their failure.[8]

7. The upgrading of the pipelines is also needed due to river erosion. Aside from a strong earthquake, the greatest risk at these crossing locations is the potential exposure of the pipeline for loss of pipeline soil cover and support resulting in excessive stresses and failure. This is a particular concern for the NPS 20 crossing at the north bank, where prevailing currents have and will likely continue to erode both the bank and the river-bed at the base of the bank. The river erosion has been established by TGI's routine surveys and evaluations. Since 1974, TGI has been performing bathymetric surveys of the South Arm crossings at regular intervals and following high flow events. The survey results have identified a gradual degradation of the river bed at the base of the north bank as well as transient local scouring between the pipelines to a depth of 4.0 m. In addition, aerial photographic records show that the north bank of the NPS 20 pipeline crossing has experienced erosion which has significantly degraded the bank armouring.[9]

8. The height of the north dike will soon be raised for municipal flood protection. The planned dike improvement works will exacerbate the stresses which exist on both pipelines as a result of previous and ongoing settlement of the dike. TGI expects that the placement of fill

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[5] Exhibit B-2, Response to BCUC IR No. 1.1.2.

[6] Exhibit B-2, Response to BCUC IR No. 1.1.1.

[7] The background studies from 1994-2006 are discussed in Exhibit B-1, at 8-9. A summary of the findings from these analyses can be found in Exhibit B-1, Appendix 3, Appendix II, at 7.

[8] Exhibit B-1, at 9-10, Appendix 5, Executive Summary at iii; Exhibit B-2, Response to BCUC IR No. 1.1.5, 1.9.2; see also Response to BCUC IR No. 1.8.4 and 1.8.5 for additional explanation of the recent studies done by Golder Associates Ltd.

[9] Exhibit B-1, at 10.

would increase the differential settlement so as to cause pipeline operating stresses to exceed the level allowed by TGI operating policies and the CSA Pipeline Standard.[10]

b. Consequences of Pipeline Failure

9. There is a significant public interest in ensuring that the crossings are not vulnerable to failure. The failure of the crossings would leave approximately 117,000 TGI customers (based on typical, above freezing winter weather, representing 50% of system design load) isolated for a prolonged period with no alternative gas supply. Under design conditions, the number of customers impacted would approach 200,000.[11] Among those customers that would be adversely affected by a prolonged loss of gas supply are facilities responsible for providing food services, accommodation and care to those most in need following an earthquake. Restoration could be expected to take from six months to a year at best, assuming the availability of extraordinary levels of assistance. The re-light would take an additional month or more, depending on the number of technicians that could be mobilized.[12]

10. In addition, it is also possible that there could be serious safety consequences related to a high pressure pipeline failure at this location.[13]

11. TGI was asked, in the context of soliciting the economic analysis comparing the *status quo* and the four Alternatives, to comment on the suggestion that this project is merely an investment in "earthquake insurance".[14] This suggestion implies that economic considerations should outweigh reliability and safety considerations in the assessment of this Project, an implication with which TGI disagrees. TGI, like all public utilities, is under a statutory duty to provide and maintain its property and equipment in a condition to enable it to provide service to the public that the Commission considers is in all respects adequate, safe, efficient, just and reasonable.[15] All system maintenance expenditures must be assessed with regard to the safety

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[10] Exhibit B-1, at 11; Exhibit B-2, Response to BCUC IR No. 1.1.7. The City of Richmond has produced designs for the dike modifications and has commenced interim dike improvements to mitigate the winter storm surge risk to the dike.

[11] Exhibit B-1, at 6, 11; Exhibit B-2, Response to BCUC IR No. 1.1.8

[12] Exhibit B-1, at 11-12.

[13] Exhibit B-1, at 12.

[14] Exhibit B-4, Response to BCUC IR No. 2.11.1

[15] *Utilities Commission Act*, section 38.

and reliability benefits obtained against the cost of performing that maintenance at the present time. There will be projects where cost savings can be achieved through the deferral of some or the entire project without risking reliability in any meaningful way, or without potentially adversely affecting a significant number of customers. In such cases, it might well be appropriate to rely primarily on an economic analysis to consider deferring some or all of the work. TGI respectfully submits that this is *not* one of those projects. With the knowledge of a probable failure upon a significant seismic event, and the potentially significant ramifications outlined in the Application and summarized above, TGI respectfully submits that it would be imprudent not to undertake the Project, or to significantly defer the replacement of one or both of the existing crossings for monetary benefits of the magnitude anticipated relative to the preferred Alternative.[16]

III. UPGRADE ALTERNATIVES

12. As described in section 5 of the Application, TGI considered five potential methodologies to remediate the crossings: HDD, system back-feeds, open trenching, aerial crossings, and ground consolidation with partial pipe replacement. HDD emerged from this analysis as the clear winner. Section 5 also describes TGI's analysis of several alternatives utilizing HDD pipeline replacement, and expands on the rationale for preferring the replacement of both crossings with new NPS 20 and 24 crossings. The evidence in support of the selected HDD methodology and project alternative is summarized below.

a. Using HDD Methodology

13. HDD is the least cost methodology to replace the crossings. It is also more advantageous than reinforcement of system back-feeds, open trenching, aerial crossings, or ground consolidation with partial pipe replacement in terms of environmental impact, and capability to mitigate the identified seismic, river erosion, and dike improvement concerns.[17] Golder Associates stated in its June 2008 report that "[a]s a result of the inferred vulnerability of both the NPS 20 and 24 T.P. pipelines due to the 4th generation seismic hazard mapping HDD pipeline replacement is considered to be the only suitable rehabilitation technique for either or

[16] Exhibit B-4, Response to BCUC IR No. 2.11.1.

[17] Exhibit B-1, at 13-14.

both pipelines."[18] The proposed HDD crossings are able to withstand ground motions having a significantly higher mean return period than TGI's seismic design criterion of 2,475 years.[19]

14. HDD is a common method for replacing river crossings. TGI has engineered and constructed major water body crossings using HDD since 1991. TGI has utilized HDD on 26 major water crossings, and performed engineering studies on many more. Small and intermediate HDD river, highway, and railroad crossings are now routinely engineered and constructed to TGI Standards.[20] TGI believes that the HDD construction will be successful. Results of previous subsurface testing and existing regional geologic information have not revealed materials which are incompatible with successful HDD construction.[21] .

b. Evaluating HDD Alternatives

15. TGI examined four Alternatives utilizing HDD for new pipeline installation within the existing right of way: (1) replacement of both the NPS 20 and NPS 24 crossings, (2) replacement of the NPS 24 crossing with a new NPS 24, (3) replacement of the NPS 20 crossing with a new NPS 20, and (4) replacement of the NPS 20 from Tilbury Gate to Nelson Gate with a new NPS 30. After considering both financial and non-financial factors such as safety concerns, environmental and property impact, operational flexibility, and ability to meet post-earthquake demands, replacement of both the NPS 20 and NPS 24 crossings with new NPS 20 and NPS 24 crossings (i.e. Alternative 1) emerges as the best Alternative.

16. The Company's evaluation of the Alternatives is discussed in section 5.3.2 of the Application, and is summarized in Table 5.1 and Appendix 13 of the Application and in the response to BCUC IR 1.11.1. The Company's discounted cost of service analysis of the Alternatives is found in BCUC IR 1.18.1. The economic (cash flow) analysis of the *status quo* and the alternatives (which produces the same Alternative ranking as the discounted cost of service analysis) is attached to the response to BCUC IR 2.11.1.

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[18] Exhibit B-1, Appendix 5, at 23.

[19] Exhibit B-2, Response to BCUC IR No. 1.2.1. In fact, HDD achieves a return period of 5,000 to 10,000 years. There is no other suitable, or less costly, construction methodology that achieves a mean return period of 2,475 years or anything between 2,475 and 5,000-10,000 years.

[20] Exhibit B-1, at 23; Exhibit B-2, Response to BCUC IR No. 1.17.1.

[21] Exhibit B-2, Response to BCUC IR No. 1.6.4.

Alternative 1

17. As indicated in the previous section, the project justification is a need to address the vulnerability of the existing crossings to failure. Alternative 1, replacing both existing pipelines with new NPS 20 and NPS 24 crossings, is the only Alternative which fully resolves all three identified risks to the pipelines. This Alternative thus improves system reliability, and avoids additional maintenance associated with other Alternatives. It also avoids future emergency response and pipeline reconstruction in potential adverse post-earthquake conditions. These conditions, which could arise if both lines are not replaced, potentially create substantial extra burdens on both TGI and the region in the event of a strong earthquake.[22]

18. The combined pipeline capacities of the new NPS 20 and NPS 24 crossings would be sufficient to meet the forecast peak day or peak hour flows beyond a 50 year period.[23]

19. Replacing both crossings during one contractor mobilization will reduce future siting and permitting risk and result in cost efficiencies. TGI anticipates cost savings of at least $6 million under today's conditions with one mobilization versus staging of the replacements of the second crossing to some time in the future or after an event that causes the crossing to fail.[24] Continued development in the area on both sides of the river will make it more difficult in the future to gain approvals and access, which could also add to the cost of doing the second replacement.[25]

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[22] Exhibit B-1, at 15; Exhibit B-2, Response to BCUC IR No. 1.11.1.

[23] Exhibit B-2, Response to BCUC IR No. 1.4.2, 1.4.4., and 1.4.11. The design day flow across the crossing is forecasted to be 350 MMscfd for the winter of 2008/2009, and growing to 390 MMscfd for the winter of 2028/2029. The design day flows at the Tilbury Gate to Nelson Gate crossing in 50 years time is estimated to be approximately 450 MMscfd. The response to BCUC IR 2.14.2 provides similar information based on peak hour capacities.

[24] Exhibit B-1, at 16; Exhibit B-2, Response to BCUC IR No. 1.5.4; Exhibit B-5, BCOAPO IR No. 2.8.1. The estimated $6 million saving is arrived at by preparing two separate cost estimates for each alternative from the same level of project planning, and then eliminating the incremental overlap in the individual estimate elements that would occur if the two alternatives were performed via simultaneous or continuous construction activities as applicable. TGI expects the range of accuracy of this estimate to be –15% +20% as the individual estimates were prepared to that range of accuracy.

[25] Exhibit B-1, at 21.

Alternatives 2 and 3

20. Replacing only one of the pipelines (Alternatives 2 and 3), though having a lower initial cost, will not effectively address the seismic concerns or long-term river erosion and dike settlement issues. Indeed, the pipeline that is not replaced will continue to operate in non-compliance with the Company's standards and would remain a potentially significant post-earthquake emergency assessment and public safety response issue.[26] A new NPS 24 alone (Alternative 2) will not fully meet winter capacity requirements throughout the planning period. Alternative 3, replacing the NPS 20 with a new NPS 20 crossing, is the option with the lowest initial cost and would replace the one pipeline most vulnerable to erosion and earthquakes; however, the NPS 20 alone is well short of capacity to meet future winter loads. The prolonged loss of the NPS 24 capacity following a strong earthquake will be unacceptable at a time when the Lower Mainland will depend on natural gas supply for regional economic recovery. That situation will necessitate immediate replacement of the failed NPS 24 pipeline during the most adverse of circumstances, which would greatly compound the other challenges that TGI will face in the aftermath of a strong seismic event.[27]

Alternative 4

21. Alternative 4, installing a new NPS 30 crossing using an HDD and abandoning the existing NPS 20 crossing in place, would provide approximately the equivalent throughput capacity as the combination of NPS 20 and NPS 24 crossings. However, the option is higher cost compared to other Alternatives, but with increased cost uncertainty. It involves a significant increase in the scope, number and duration of landowner, tenant, and environmental/land restoration impacts from open trench construction activities, which would extend to either side of the crossing by 2.8 km. Finally, in the event of a failure of the NPS 24 as a result of a strong seismic event, Alternative 4 lacks a parallel pipeline for a critical underwater crossing to provide long-term reliability and operational flexibility.[28]

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[26] Exhibit B-1, at 16-17.

[27] Exhibit B-1, at 21-22.

[28] Exhibit B-1, at 18-19, 22; Exhibit B-2, Response to BCUC IR No. 1.4.6; BCOAPO IR 2.10.1.

Other Alternatives

22. TGI was asked in BCUC IR 1.4.8 to assess other HDD options, neither of which is more advantageous than the preferred Alternative 1. The installation of a single NPS 36 is estimated to cost $39.5 million,[29] which is $12.2 million more than TGI's preferred Alternative. The additional pipeline capacity offered by the larger line size of NPS 36 is also not required to meet forecasted demand.[30]

23. Another option presented in information requests was to upgrade the NPS 24 line at the south river bank along with an HDD replacement of the NPS 20, which is a sub-set of Alternative 3. The Company's analysis suggests that this option would cost $1.3 million more than Alternative 3, and would only marginally improve seismic withstand capability.[31]

24. In addition, the Commission asked TGI to estimate the cost of replacing the NPS 20 with either NPS 24 or NPS 30 lines, which would necessitate the installation of cross-over valve assemblies complete with inspection tool launchers and receivers. This option not only would add $5.6 million and $6.3 million capital cost to Alternative 2, but would also add to operating and maintenance costs of the pipelines. TGI calculated the additional present value of these alternative cash flows at $6.4 million and $7.2 million respectively.[32]

Conclusion on Alternatives Analysis

25. TGI provided in BCUC IR 1.11.1 and Appendix 13 of the Application financial and non-financial comparisons of Alternatives 1 – 4, plus Alternative 5 using a NPS 36 crossing. Although Alternatives 2 and 3 have lower capital cost estimates, the non-financial ranking matrix identifies Alternative 1 as having the highest overall ranking, by a considerable margin. In this analysis, Alternative 1 was ranked considerably higher than the second highest ranked Alternative, Alternative 4 -- NPS 30. TGI respectfully submits that Alternative 1 should be pursued for the clear non-financial advantages associated with it.

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[29] Exhibit B-2, Response to BCUC IR No. 1.4.8.
[30] Exhibit B-2, Response to BCUC IR No. 1.4.1.
[31] Exhibit B-2, Response to BCUC IR No. 1.8.2.
[32] Exhibit B-4, Response to BCUC IR No. 2.15.1, 2.15.2, 2.15.3.

IV. PROJECT CONSTRUCTION

a. Proposed Project

26. Alternative 1 involves the replacement of the existing transmission pipelines with new NPS 20 and NPS 24 pipelines installed using HDD technology. The two new crossings will have the same length of approximately 1400 meters as the existing crossings and will be constructed within the existing right-of-way, both on land and across the river at depths significantly below the existing crossings. Natural gas delivery to downstream customers will not be affected during construction.[33] TGI anticipates no difficulty accommodating the presence of a water main near the Project.[34]

27. TGI expects that the project will require a total of two full time utility personnel during the CPCN Application and detailed design phases and may have one additional full time utility person during the Construction Phase (three in total). Although in-house engineering services will be utilized for parts of the pipeline design, specialized services required for environmental management, geotechnical investigation and analysis, HDD pipe and profile design, and construction inspection will be contracted to qualified professionals and companies to ensure that public and worker safety, quality workmanship and environmental compliance are maintained throughout the Project.[35]

b. Schedule

28. The Company expects the construction of the Project to occur between June 2009 and October 2009, with an in-service date in November 2009. However, the Company may consider deferring construction start to in or about May 2010.[36]

29. The central issue in deferring construction start to 2010 is evaluation of the required 2009 and 2010 control budgets, following receipt of tenders.[37] Depending on the

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[33] Exhibit B-1, at 7.

[34] Exhibit B-4, Response to BCUC IR. No. 2.17.2, 2.17.3.

[35] Exhibit B-1, at 35-36; Exhibit B-2, Response to BCUC IR No. 1.7.1.

[36] Exhibit B-1, at 27; see also Exhibit B-4, Attachment 12.2, Exhibit B-4, Response to BCUC IR 2.12.6..

[37] Exhibit B-4, Response to BCUC IR No. 2.12.3.

tenders received, total estimated project costs may be less expensive in 2010 vs. 2009, offsetting any marginal increases in project management, engineering, consultation, AFUDC and other costs.[38]

30. TGI would also consider deferring the entire mainline construction phase to 2010 in the event that the receipt of regulatory permits were to be delayed until after July 2009 such that a November 2009 in-service date for both pipelines becomes unlikely. However, the Company anticipates the permitting for the HDD river crossing replacements to follow existing and routine permit application processes. TGI has not identified regulatory permitting processes for the Project that requires an extended timeline.[39]

31. Further discussion of the pros and cons of deferring the start date to 2010 is included in BCUC IR 2.12.6.

32. TGI expects to make the decision in or about May 2009 to complete the Project in 2009 or delay it to 2010, predicated on evaluation of construction tenders, and determination of revised cost estimates for both options. At that time TGI will also evaluate risks to the permitting process and completion of working space agreements, to assess the probability of meeting schedule deadlines before proceeding. TGI would take steps to minimize expenditures in the event of deferral.[40]

c. Project Cost

Estimate Range

33. Based on the preliminary project design, the most recent studies and information available to TGI and an in-service date of November 2009, TGI estimates the total capital cost of the proposed replacement of both crossings to be approximately $27.3 million in 2008 dollars.[41]

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[38] Exhibit B-2, Response to BCUC IR No. 1.5.3; Exhibit B-4, Response to BCUC IR No. 2.12.1-2.12.4.

[39] Exhibit B-2, Response to BCUC IR No. 1.19.1.

[40] Exhibit B-4, Response to BCUC IR 2.12.5.

[41] Exhibit B-1, at 26, Exhibit B-4, Response to BCUC IR No. 12.1. The estimate of $27.3 million differs from the estimated cost of $9.75 million included in the 2008 Resource Plan. In Exhibit B-2, Response to BCUC IR No. 1.15.1., the Company explained the differences. See also Exhibit B-4, Response to BCUC IR No. 2.18.1 for further discussion.

Individual cost elements in the estimate include project management, land utilization, pipe and coating materials, HDD installation, and operations and commissioning.[42]

34. In preparing the estimate range for this Application, TGI has estimated the expected cost range for each line item by considering historical costs, non-binding quotations and discussions with applicable groups.[43] TGI developed an overall estimate based on its experience and on the best information currently available.[44] The expected accuracy of the cost estimate is -15 to +20%. TGI submits that the cost estimates provided in the Application are within an acceptable accuracy range to rank the Alternatives studied in order to determine the optimum Alternative.[45]

35. The Company is mindful of risks to cost, such as engineering/construction resources, material cost/delivery, and HDD contract cost, and has identified measures to control the cost and mitigate the risk. One such measure is to schedule the HDD construction work, which represents the largest single component of the project cost, for the summer or fall, when the contractors are more available and pricing will be more competitive.[46] TGI also intends to structure the HDD contract in such a way as to arrive at an appropriate balance between price and retention of some risk. The contract documents will require that TGI and the HDD contractor jointly manage construction activities and operational delays that result in an increased construction schedule beyond the base contract schedule, due to unforeseen subsurface conditions that are not identified in or can be reasonably inferred from the geotechnical reports. Although TGI has conducted extensive geotechnical investigations and expects that any delays due to unforeseen or variable subsurface conditions are likely to be non-routine and with low frequency, a fair apportionment of risks provides appropriate incentive to the contractor to prudently manage its resources to cost effectively mitigate the impact of any unforeseen subsurface risk to the final costs of the Project.[47]

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[42] Exhibit B-1, at 28; Exhibit B-2, Response to BCUC IR No. 1.5.5; 1.5.9.
[43] Exhibit B-2, Response to BCUC IR No. 1.5.1; 1.5.5..
[44] Exhibit B-1, at 26; see Exhibit B-2, Response to BCUC IR No. 1.5.5, 1.5.9.
[45] Exhibit B-1, at 25-26; Exhibit B-2, Response to BCUC IR No. 1.5.8, 1.5.11.
[46] Exhibit B-1, at 28.
[47] Exhibit B-1, at 28; Exhibit B-2, Response to BCUC IR 1.6.2, 1.6.3.

Control Budget and Cost Risk Analysis

36. TGI expects to have sufficient information to file a control budget with the Commission in the spring of 2009, after receipt of the line pipe bids, land owner agreements and HDD/Pipeline contract bids.[48] TGI expects that the control budget will be within the -15% to +20% range of the current estimate. As per TGI's Response to BCUC IR 1.5.9, TGI has estimated the expected cost range for each line item, and developed an overall estimate based on its experience and on the best information currently available. However, it is not possible for TGI to *guarantee* that the new budget will be within the -15 to +20% range since the control budget is, to a significant degree, a function of the HDD contract price and the subsequent cost risk analysis.[49]

37. TGI will complete a cost risk analysis that can be used to determine P10 to P90 confidence levels at the same time as preparing the control budget.[50] TGI's evidence is that the appropriate point in the schedule to determine P10 and P90 confidence levels is after receipt of material and pipeline construction tenders; it is premature to conduct the cost risk analysis for inclusion with this Application. TGI expects that the materials and pipeline construction contracts will represent two-thirds of the project cost. Developing a probable low cost, a most likely cost, an extreme likely high cost, and the probability distribution for the materials and construction categories prior to tendering will be subjective and not lead to accurate P10 and P90 estimates. Once material and pipeline construction tenders are received, it will be possible to improve project cost estimating accuracies, inclusive of reserve and contingency. TGI believes it is quite reasonable to assume, based on estimating experience and methods, that when a P50 value is calculated it will fall within the +20% / -15% range of accuracy on the estimate provided in the Application.[51]

[48] Exhibit B-2, Response to BCUC IR 1.5.2.; 1.5.11.
[49] Exhibit B-4, Response to BCUC IR 2.12.7
[50] Exhibit B-2, Response to BCUC IR 1.5.7.
[51] Exhibit B-4, Response to BCUC IR 2.12.7; 2.19.1.

d. Cost of Service Impact

38. TGI estimates that the annual incremental cost of service for the $27.3 million investment in the new crossing assets to be approximately $2.2 million starting 2010. Based on forecasted volumes for sales and applicable transportation customers, less bypass transportation service customer volumes, TGI estimates that the unit cost of service impact will be 1.4 cents per GJ starting 2010, and will decrease slightly in the next 20 years.[52]

V. ENVIRONMENTAL AND SOCIO-ECONOMIC CONSIDERATIONS

39. An environmental screening-level assessment of the Project was completed in September 2008, and this assessment has been supplemented with two additional detailed assessments. A screening level archaeological overview has confirmed that there are no known archaeological sites or areas of archaeological potential within or immediately adjacent to the Project area. A preliminary agricultural assessment of the potentially affected Agricultural Land Reserve property has been completed.[53] All potential environmental impacts associated with the Project will be temporary and mitigated through the implementation of standard mitigation protocols during construction and site restoration.[54]

40. As explained in the Application, the Project will cause only minor disruption to or impact on the operations of a few industrial properties, farms, and owners on both sides of the Fraser River due to noise at the drilling site, possible road closures, vehicle access, temporary loss of parking, and site restoration/remediation.[55] TGI has had preliminary discussions with property owners and lessees on these issues and expects to develop reasonable resolutions that mitigate the impact.[56]

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[52] Exhibit B-1, at 37; Exhibit B-2, Response to BCUC IR 1.12.1. With Exhibit B-2, Response to BCUC IR 1.12.1, the Company provided a revised cost of service impact and explained that "the forecasted volumes used were for total sales and transportation service customers, less bypass transportation service customer volumes. However, non-bypass volumes were subtracted in error instead of bypass volumes which resulted in a slight change to the Cost of Service calculation provided in the Application. The cost of service impact is still estimated to be 1.4 cents per GJ starting in 2010."

[53] Exhibit B-1, at 28-30.

[54] Exhibit B-1, at 29.

[55] Exhibit B-1, at 25, 32.

[56] Exhibit B-1, at 30-31, 32.

VI. PUBLIC AND FIRST NATIONS CONSULTATION

41. TGI submits that TGI's public consultation and communication plan has been appropriate and has met the expectations of landowners and interested stakeholders alike. TGI has completed preliminary discussions with each of the project stakeholders identified and listed on pages 31 and 32 of the Application, including affected property owners and lessees, the City of Richmond, the Corporation of Delta, Metro Vancouver,[57] and Fraser River Port Authority. To date, no significant objections to the Project have been expressed. In fact, the City of Richmond has expressed in its support of the Project because "the application addresses both pipelines, therefore assuring reliability of natural gas service to the constituents of various Metro Vancouver municipalities."[58]

42. TGI has contacted three First Nations who have archaeological interests in the area - Tsawwassen First Nation, Katzie First Nation and Musqueam First Nation - and has communicated an overview and provided documents of the proposed Project to the three First Nations for their information. The extent of the consultation has been appropriately informed by the limited potential to affect First Nations. To date, none of the three First nations have expressed any objection to the project.[59] In the circumstances, an affirmative response from these First Nations is not a requirement for the granting of a CPCN or to proceed with the Project.[60]

43. TGI will remain inclusive and proactive through all phases of the Project in its communication with property owners, First Nations and other stakeholders.[61]

VII. CONCLUSION

44. The available evidence suggests that the existing crossings are likely to fail in the event of a seismic event and are vulnerable due to river erosion and dike settlement. TGI submits that a long-term safe and reliable gas supply through the back-bone of the Lower

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[57] See also Exhibit B-4, Response to BCUC IR 2.17.3.

[58] Exhibit C3-2.

[59] Exhibit B-4, BCUC Response to IR 2.21.1.

[60] Exhibit B-1, at 32; Exhibit B-2, Response to BCUC IR No. 1.14.1. Consultation obligations do not convey to First Nations a veto over projects.

[61] Exhibit B-1, at 33.

Mainland transmission system is vital to the social and economic well-being of hundreds of thousands of customers in the region.[62] For this reason, the Project is in the public interest and necessity – indeed, it is appropriately characterized as non-discretionary. On the evidence, the proposed replacement of the NPS 20 and NPS 24 crossings using Horizontal Directionally Drilled technology is a cost-effective response to the demonstrated need to replace the existing crossings.

45. A draft order is found at Exhibit B-4, Attachment 12.12. It reflects TGI's proposal[63] that the Commission approve the revised control budget prior to the project proceeding only if the revised control budget exceeds the current -15 to +20% range of estimates provided in the Application. The HDD contract would be structured such that giving final notice to the contractor to proceed would be conditional to TGI receiving final Commission approval of the revised cost control budget, if approval is required. While TGI submits that the Project is in the public interest by virtue of the system reliability considerations outlined in the evidence, the above proposal was intended to provide the Commission and customers with additional comfort regarding the management of project costs.

46. TGI respectfully submits that the Application should be granted.

All of which is respectfully submitted.

[Original signed by Matthew Ghikas]

Matthew Ghikas
Counsel for Terasen Gas Inc.

All of which is respectfully submitted.

[Original signed by Song Jin Hill]

Song Jin Hill
Counsel for Terasen Gas Inc.

January 28, 2009

[62] Exhibit B-2, Response to BCUC IR No. 1.1.8.

[63] Exhibit B-4, Response to BCUC IR 2.12.8. The proposal from the Application was clarified and revised in this response.