IN THE MATTER OF

TERASEN GAS INC.

AND

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY
FOR THE FRASER RIVER CROSSING UPGRADE PROJECT

DECISION

March 12, 2009

Before:

Anthony J. Pullman, Panel Chair/Commissioner
Dennis A. Cote, Commissioner

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OVERVIEW

This Decision is issued concurrently with Commission Order C-2-09.

On November 6, 2008, Terasen Gas Inc. ("TGI" or the "Company") filed an application (the "Application") with the British Columbia Utilities Commission ("BCUC" or the "Commission") for a Certificate of Public Convenience and Necessity ("CPCN") for the Fraser River Crossing Upgrade Project (the "Project").

Section 1.0 describes the background of the Application, provides a description of the Applicant, the Order being sought, an overview of the Project, and the regulatory process which was utilized to hear the Application.

Section 2.0 outlines the need for the project and provides a justification for going forward. This will include the background, the standards and the consequences of a major pipeline failure.

Section 3.0 describes each of the methodologies and the alternatives considered with a qualitative and economic analysis of each.

Section 4.0 provides a comprehensive description of the Project, the schedule, the team requirements, the various permits and approvals required as well as project costs, risks and reporting methodology.

Section 5.0 describes the process for public consultation and First Nations issues.

1.0 BACKGROUND AND REGULATORY PROCESS

Section 1.0 of this Decision sets out the background of the Application, provides a description of the Applicant, the Order being sought, an overview of the Project and the regulatory process which was utilized to hear the Application.

1.1 The Applicant

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

TGI is the largest natural gas distribution utility in British Columbia. With over 840,000 customers, TGI provides sales and transportation services to residential, commercial and industrial users in more than 100 communities in its Inland, Columbia and Lower Mainland ("LM") service areas. TGI reports it has constructed a system of integrated high, intermediate and low pressure pipelines to distribute gas to more than 80 percent of natural gas customers in British Columbia. In providing this distribution service, the Company operates in excess of 38,000 kilometers of natural gas transmission and natural gas distribution mains and service lines in the province (Exhibit B-1, pp. 1-2)

1.2 Order Sought

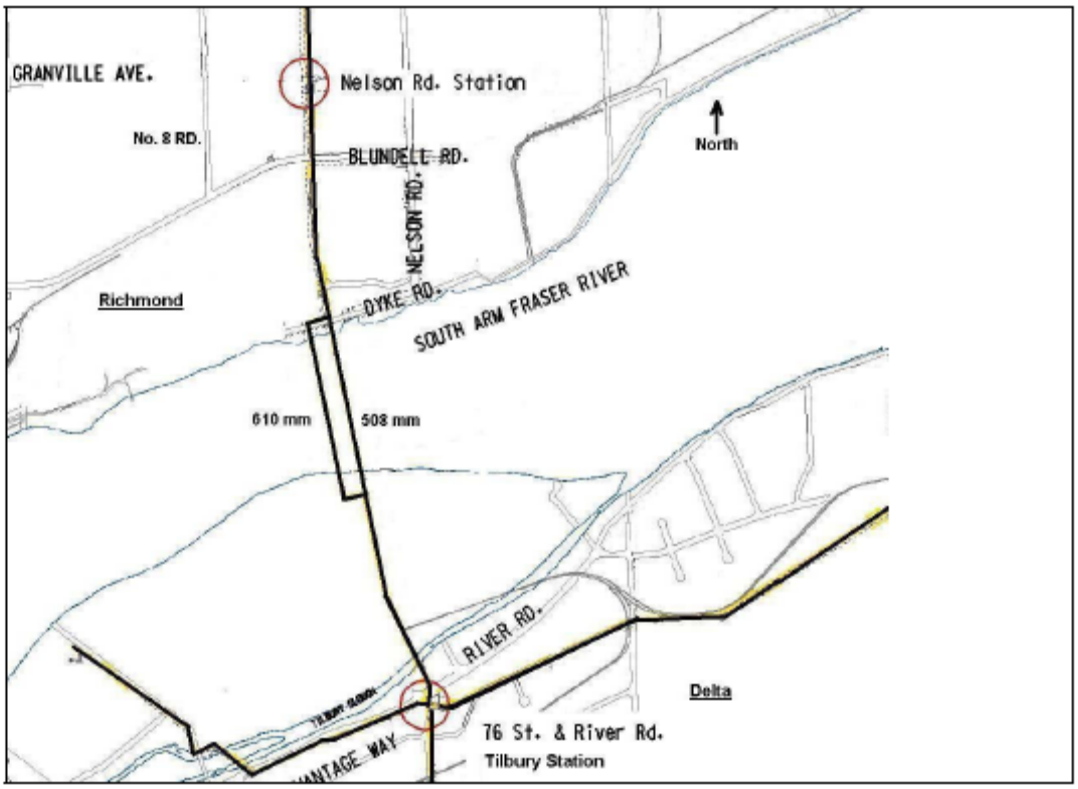
By letter dated on November 6, 2008, TGI applied to the Commission, pursuant to Section 45 of the Utilities Commission Act (the "Act"), for a CPCN to provide upgrades to the existing transmission pipeline system which crosses the south arm of the Fraser River. Specifically TGI seeks approval for the following:

> "Replacement of approximately 1400 m of existing NPS 20 (508 mm) and 1400 m of existing NPS 24 (610 mm) outside diameter ("OD") transmission pressure pipelines, both to be installed across the Fraser River using Horizontal Directionally Drilled ("HDD") technology."
>
> (Exhibit B-1, p. 1)

In recognition of the importance of minimizing the impact on rates, TGI proposes to: "(i) structure the HDD contract as being conditional upon Commission Review and Approval; (ii) schedule the project to avoid higher winter prices for HDD, (iii) file a revised control budget accounting for new information; and (iv) file with the Commission quarterly project progress reports and a project completion report in a form developed in conjunction with Commission staff" (Exhibit B-1, p. 26).

1.3 Project Overview

The Fraser River South Arm Crossings are currently comprised of two parallel natural gas transmission pipelines which were installed in trenches across the river bed. The smaller, NPS 20 installed in 1958, and the larger, NPS 24 installed in 1974, cross beneath the South Arm of the Fraser River in the area between Richmond and Delta near Tilbury Island which is approximately 5 Km east of the Massey Tunnel. The Project, as proposed by TGI, will entail constructing approximately 1,400 meters (0.9 mile) of 508 mm (20-inch) and 610 mm (24-inch) HDD pipelines and will replace existing buried crossings of the same size at the same location. In doing so TGI notes that to complete construction, the temporary shut down of each pipeline will be a requirement. However, TGI also notes that while one pipeline is shut down, the other will have sufficient capacity to supply customers during the construction period. TGI states that the both pipeline crossings will be constructed utilizing the existing Right-of-Way ("ROW") for the land and river crossings (Exhibit B-1, pp. 3-7).



TGI states that the expected cost for the Project is $27.3 million in $2008 dollars (based on Alternative 1 which has been recommended) with an expected accuracy of -15 percent to + 20 percent (Exhibit B-1, pp. 25-26). TGI stated that it has yet to determine a construction schedule citing the need to undertake a tendering process and prepare 2009 and 2010 control budgets to determine which is financially the more attractive (Exhibit B-4, BCUC 2.12.3). TGI indicated that with the present status of preparatory work done, completion of the Project in 2009 is "reasonably feasible" (Exhibit B-4, BCUC 2.12.6).

In justification for the Project TGI states that with the potential for the failure of the two crossings with particular attention to failure as a result of a major seismic event and the consequences which would result, it has "concluded that the risk associated with these crossings is unacceptable and remedial action is required" (Exhibit B-1, p. 12).

1.4 Regulatory Process

By Order G-173-08, the Commission ruled that the Application was to be examined by a Written Public Hearing process and conducted in accordance with a regulatory timetable. Intervenors or Interested Parties were requested to register with the Commission in writing or by electronic submission no later than December 4, 2008. The Timetable allowed for two rounds of Information Requests ("IR") with the first of these scheduled for December 8, 2008 for the Commission and December 11, 2008 for the Intervenors. The response of TGI to both parties was to be completed by December 24, 2008. The second round of IRs for both the Commission and Intervenors was to be completed by January 20, 2009 with the TGI Response scheduled for January 26, 2009. TGI filed its Argument on January 28 with the BC Old Age Pensioners Organization *et al*. ("BCOAPO") being the only Intervenor to file Argument on February 4, 2009. TGI filed its Reply on February 11, 2009.

By letter dated February 26, 2009, following the Court of Appeal for British Columbia's decisions in *Kwikwetlem First Nation v. British Columbia (Utilities Commission)*, 2009 BCCA 68 and *Carrier Sekani Tribal Council v. British Columbia (Utilities Commission)*, 2009 BCCA 67, where the Court of Appeal held that the Commission has a constitutional duty to consider whether the Crown's constitutional duty of consultation and, if necessary, accommodation has been fulfilled with respect to the subject matter of the application, the Commission requested "submissions from the Applicant and Intervenors on the following issues:

- Does the Crown's duty to consult and, if necessary, accommodate arise in the circumstances of this application;
- If so, what is the scope and content of that duty in this application; and
- If the answer to question 1 is yes, has the Crown's duty to consult and, if necessary, accommodate, been fulfilled in this application".

(Exhibit A-6)

TGI responded by letter dated March 4, 2009 (Exhibit B-6). BCOAPO filed its submission by letter dated March 9, 2009 (Exhibit C2-4) and TGI filed its reply submission on March 11, 2009 (Exhibit B-7).

2.0 NEED AND PROJECT JUSTIFICATION

2.1 Background

TGI operates two parallel natural gas pipeline crossings of the South Arm of the Fraser River between Delta and Richmond. The pipelines were installed at different times based on demand requirements. The first of these, the Nominal Pipe Size ("NPS") 20 crossing was completed in 1958 as an important part of introducing natural gas to the LM in the 1950's and 1960's. As demand continued to increase, there was a need for a second pipeline which resulted in the installation of a bigger NPS 24 pipeline in 1974 to work in tandem with the existing crossing. The pipelines are described by TGI as "welded steel, weighted with a concrete outer coating, and were installed in trenches across the river bed". The two pipelines serve the following communities: Richmond, Vancouver, North Vancouver City and District, West Vancouver and parts of Burnaby (Exhibit B-1, p. 6).

TGI stated that if this Project were not being proposed, the assumed life of the existing pipelines would be 60 years which would require the NPS 20 to be replaced in 2018 and the NPS 24 in 2034 (Exhibit B-2, p. 61). However, it points out that there are currently three significant threats to the integrity of the pipelines: seismic vulnerability, erosion vulnerability and dyke settlement vulnerability. In combination, the need to mitigate these vulnerabilities is the basis for the TGI justification of the Project (Exhibit B-1, p. 8).

2.1.1 Seismic Vulnerability

TGI states that in the event of a major earthquake both pipelines crossing the South Arm of the Fraser River will fail. It reports that in order to address the concerns with the impact of a major seismic event, a review of its pipelines in the LM was undertaken. In 1994 a report was commissioned from Golder Associates Ltd. ("Golder") which "identified the potential for long-term disruption of the gas supply to large portions of the system, including the Fraser River South Arm

Crossing, based on soil liquefaction and lateral spread ground displacement in a major seismic event". In 1996, Golder conducted an initial evaluation of both of the Fraser River South Arm Crossings. TGI states that the resultant report indicated the existing crossings would very nearly meet TGI's seismic criterion if a number of on-shore improvements were undertaken. TGI further states that given the lack of certainty associated with this report, it decided to re-engage Golder to conduct seismic analysis and field studies at the site through the period up to and including 2006, with the expectation that these studies would provide improved definition of seismic vulnerability and lead to identifying options which could potentially alleviate any concerns (Exhibit B-1, p. 9)

TGI states that the availability of additional geotechnical information, more sophisticated seismic modeling and the fact that both of the crossings pass through "soil layers which are susceptible to liquefaction" led it to commission Golder to update its previous findings in 2007. On the basis of the study, TGI reports that the Golder report "concluded that a strong earthquake will cause liquefaction underneath the river bed, leaving the pipelines unsupported and subject to comprehensive (buckling) stresses which would likely result in the failure of the pipelines in the middle of the river" (Exhibit B-1, p. 9). The report goes on to recommend the following:

- using HDD techniques to undertake a full replacement of the NPS 20 pipeline extending onshore for 200 meters; and
- undertake only a limited replacement of the NPS 24 pipeline at the southern bank of the river at the east –west offset. This would include replacing grade X52 pipe (7.1 mm wall thickness) with X60 pipe (13.7mm thickness) at the segment which is on-shore, north of the river dyke.

It states that if these measures were implemented it would be "considered to provide a reasonable level of assurance that both the NPS 24 and the replacement NPS 20 T.P. pipelines will maintain pressure integrity following a severe earthquake" (Exhibit B-1, Appendix 3, p. 11).

TGI states that, recognizing the consequences of a potential failure of the crossings, it arranged for an independent review of Golder's 2007 Report by BGC Engineering Ltd. ("BGC"). BGC's Report concluded that the methodology utilized by Golder to calculate ground deformations was correct and in line with current standard practices (Exhibit B-1, p. 9). In addition, it also supported the recommendation from the study that the crossing be replaced by HDD. However, the BGC Report raised the concern that undertaking only a limited replacement of the NPS 24 pipeline while improving the onshore areas, would leave the offshore segments at a level of risk. Accordingly, the recommendation of BGC was to also replace the NPS 24 pipeline utilizing HDD technology as a means of minimizing this risk. If the HDD option was to be pursued, the Report stated that "as part of the detailed design, further site investigation will be necessary within the centre of the Fraser River channel to characterize the subsoil where no information currently exists" (Exhibit B-1, Appendix 4, p. 5).

TGI states that it again commissioned Golder in 2008 to update its 2007 work using Geological Survey of Canada updates to seismic data and modeling. In addition, Golder was requested to collect soils information from within the river channel and incorporate it. Golder's 2008 study reports that based on the utilization of 4th generation seismic maps (which were not used in the previous study due to their not being available at the time the technical analysis and investigations were being summarized), the limited replacement of the NPS 24 pipeline at the southern bank which had been recommended in the 2007 study "likely would not provide the seismic performance required by Terasen in light of the higher ground motions predicted" (Exhibit B-1, Appendix 5, p. 23; Exhibit B-2, BCUC 1.9.2). The use of these maps determined that both pipelines are susceptible to pressure integrity loss in the case of seismic events which have the following probabilities of occurrence:

- for the NPS 20 Pipeline a 300 - 500 Year Return Period; and
- for the NPS 24 Pipeline a 500 - 800 Year Return Period.

As a result of this, TGI summarizes that neither pipeline currently satisfies its seismic design guideline which requires the design of a pipeline to be sufficient to withstand a seismic occurrence with a return period of 2,000 years (Exhibit B-1, pp. 8-10).

2.1.2 River Erosion Vulnerability

TGI reports that it has conducted regular bathymetric surveys of the effected areas since 1974 with additional work being done following high flow events, and that the results of this work has identified an ongoing but gradual degradation of the river bed close to the north bank as well as the effects in the area between the pipelines as a result of transient river scouring to a depth of 4.0 m. Furthermore, it has reported that the north bank of the NPS 20 pipeline has experienced erosion resulting in degradation of the bank armoring (supportive information is from aerial photographic records). At greatest risk, states TGI, is the NPS 20 crossing which was installed at a significantly shallower depth than the NPS 24 crossing which was installed at a later date. To mitigate the fact that the depth of cover over the NPS 20 pipeline is significantly less than the anticipated depths of a river scour following a 1 in 200 year flood event, TGI reports that in 2002 it installed scour protection blankets over both pipelines at the north bank. In spite of this being done, the company states that "if the NPS 20 is not replaced, it is evident that on-going monitoring, analysis and mitigation measures will be required in order to reduce the risk of failure due to erosion" (Exhibit B-1, pp. 10-11).

2.1.3 Dike Settlement Vulnerability

TGI states that since the dikes on both the north and south sides of the river have been constructed, both pipelines have been subjected to increased but nonetheless acceptable stress levels due to differential settlement. It notes that the dike on the north bank does not meet the provincial flood protection standard of a 1 in 200 year flood event and, as a result, must be raised another .65 meters above its current height. TGI states that if this is achieved by augmenting the current structure with additional fill, it expects the impact on differential settlement to be such

that the stress level allowed by its operating policies and the Canadian Pipeline System Standard will be exceeded (Exhibit B-1, p.11).

2.2 Standards

TGI states the Canadian Pipeline System Standard CSA Z662 has a requirement that an element of the criteria for design of any oil or gas pipeline is the anticipated seismic loading. Consistent with this standard, with industry practice and with its own seismic design guidelines, TGI requires that pipeline design be capable of withstanding the seismic loading which may be anticipated in the event of a seismic event with a return period of 2,000 years. This, in effect converts to a probability of being exceeded to 2.5 percent over 50 years. It further reports that it has employed this design criterion since 1996 and that it is in keeping with that which is currently used by other utilities (Exhibit B-1, p. 8).

TGI provided the following examples of seismic criteria which are employed by other utilities on the West Coast:

- BC Transmission Corp capital plan filings with the Commission cite a seismic risk criterion of 2 percent probability of exceedance in 50 years;
- Metro Vancouver has advised TGI that it uses the 2,475 return period as per the National Building Code of Canada 2005 and is in the process of updating its standard to the new code;
- Spectra Energy Transmission advises that if it were to design any new major assets in the region, it would use asset-specific and site-specific risk analysis;
- the National Energy Board's 2000 decision on the proposed Georgia Strait Crossing ("GSX") required the proponents to revise their design criterion from a 10 percent probability of exceedance in 50 years to a 2 percent probability of exceedance in 50 years; and
- both Pacific Gas and Electric Company and Southern California Gas Company guidelines, which are referenced in California and Oregon utility regulations, refer to the same seismic design guidelines as does TGI's design standard. Those guidelines do not

> mandate specific criteria, but do make reference to the use of International Building Code seismic hazard maps for a 2% probability of exceedance in 50 years."

(Exhibit B-2, BCUC 1.2)

TGI further explained that it is common for utilities to select a given seismic design criteria based upon a specific risk analysis of a given site. Its interpretation of the above information is that a 2,475 year return period can be considered typical. TGI has chosen this design criterion for this critical crossing (Exhibit B-2, BCUC 1.1).

2.3 Consequences of a Seismic Event Causing Major Pipeline Failure

TGI states that in a normal, above freezing winter year as is typically experienced in the Project area, a major failure of both crossings would leave 117,000 of its customers isolated with no gas supply alternatives (based on 50 percent design load). This would affect a wide variety of customer groups (commercial, government, and residential) including the following:

- stores and restaurants;
- schools and educational facilities;
- large and small commercial and industrial businesses;
- retail stores and restaurants; and
- residential customers resulting in 300,000 residents having no access to gas services.

TGI further states that under design conditions the total number of customers impacted would be closer to 200,000, and that in either instance the impact would be very severe not only to businesses, industries and residents but, even more importantly, to facilities which would be relied upon to provide services, food and accommodation in the event of such an occurrence (Exhibit B-1, pp. 11-12).

If such a failure were to occur, TGI estimates that a best case scenario would be for restoration to occur six to twelve months later and only if the required level of resources and assistance were available. Furthermore, it anticipates the circumstances associated with a post earthquake environment would result in a reconstruction of a replacement pipeline costing significantly more. In addition, TGI estimates that the re-light costs alone would amount to $12 million and will take additional months to accomplish. TGI states that the Fraser River Crossing is unlike others which may occur in more accessible or repairable parts of the system and points out the integrity of the system is a critical factor in minimizing the impact of a gas supply interruption to the effected parts of the LM (Exhibit B-1, p. 12).

TGI submits that completion of the Project as outlined in the Application will provide solutions to the three major threats to the integrity of the existing pipeline crossings; seismic vulnerability, river erosion and dike settlement. The Company states that the consequences of pipeline failure are significant with the customer base being isolated for a long period of time and restoration taking six months to a year at best. Finally, TGI submits that because of the knowledge of a probable failure in the event of a significant seismic occurrence and the impact this will likely have, it would be imprudent to fail to undertake or defer the replacement of one or both of the existing crossings (TGI Argument, pp. 3-5).

BCOAPO makes note of the work done by TGI to explain and support the need for replacement of the two pipelines crossing the South Arm of the Fraser River. In addition, it further notes the potential impact of a pipeline failure on the significant customer base as is outlined by TGI in its evidence (BCOAPO Submission, pp. 1-3). Given this background, BCOAPO indicates that its position is that TGI demonstrated judgment in its evaluation of the options as well as in the determination of the criterion for a return period and positioning of the pipe. In keeping with the evidence provided by TGI which includes the reports prepared by independent engineering firms, BCOAPO states it “has no basis to dispute TGI’s determination that (i) this project is non-discretionary and (ii) the alternative proposed is in the public interest” (BCOAPO Submission, pp. 3-4).

3.0 ALTERNATIVES EXAMINED

This Section describes the methodologies and the alternatives examined by TGI and its analysis and comparison thereof.

TGI states that it considered a number of alternatives both in terms of methodology and location to address its concerns with the two crossings. TGI addresses methodology and states that it identified five potential methodologies to remediate the crossing of the Fraser River.

3.1 Reinforcement of System Back-Feeds

TGI states that reinforcement of existing back-feeds would involve looping the transmission system from Surrey to Coquitlam, the addition of large-diameter intermediate pressure pipelines across Coquitlam and Burnaby, and the abandonment of major existing assets. TGI states that it judged this option to be significantly more costly than replacing both crossings, and rejected it without preparing a detailed cost estimate (Exhibit B-1, p.13).

3.2 Ground Consolidation and Replacement with Higher Strength Pipe

TGI states that it could improve the existing crossings by using ground consolidation, combined with higher strength pipe replacement, but that this methodology would not adequately reduce the vulnerability of both crossings to failure caused by seismically induced soil liquefaction, subsequent pipe movement, or failure under the river bed, nor would it mitigate the on-going river erosion or dike settlement concerns. TGI states that it ruled the methodology out on this basis without preparing detailed cost estimates (Exhibit B-1, p.13).

3.3 Aerial Crossing

TGI states that it also considered aerial crossings to replace one or both river crossings, and that while this methodology would address concerns associated with seismic events, erosion and dike improvements, and avoid environmental concerns associated with trenching, it would require the crossing to span the entire distance impacted by any potential soil liquefaction and consequently would require a massive structure spanning over 1,400m and built sufficiently high to permit ocean-going ships to pass underneath it. TGI also notes that this methodology would involve substantial land use impacts at both ends, including construction of the north bridge tower within an existing industrial park, new ROW, and conflicts with existing pipelines. This would have significant permitting and implementation difficulties with adverse stakeholder impacts. TGI states that it judged this option to be significantly more costly than replacing both crossings, and rejected it without preparing a detailed cost estimate (Exhibit B-1, pp.13-14).

3.4 Open Cutting of the River Bed (Trenching)

TGI states that it ruled out open cut trenching in a large river such as the Fraser as the technology presents significant logistical challenges and is now generally considered unacceptable to federal and provincial agencies, given the availability of HDD technology. In addition, it states that it considered trenching impractical to reach the soil depth needed to address the seismic design requirements, and as a result did not prepare cost assessments of this option (Exhibit B-1, p.14).

3.5 Horizontal Directional Drilling

TGI concludes that utilizing HDD for new pipeline installation was determined to be the best upgrade choice on the basis of cost, low environmental impact and the ability to mitigate all seismic, river scour, and dike improvement concerns (Exhibit B-1, pp.13-14).
TGI stated that HDD is a common method for replacing river crossings and that since 1991 it has utilized HDD on 26 major water crossings, and performed engineering studies on many more (Exhibit B-2, BCUC 1.17.1).

3.6 HDD Alternatives Considered

TGI states that it examined four HDD replacement alternatives in detail as follows:

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

TGI reviews the four alternatives as follows:

Alternative 1

TGI states that Alternative 1 comprises the replacement of both the NPS 20 and NPS 24 crossings with new NPS 20 and NPS 24 crossings using HDD, and tying them into the existing pipelines on either side of the river (Exhibit B-1, p. 15).

TGI summarizes its conclusions from its review of Alternative 1, and states that it is the only alternative which fully resolves all issues, both current and future (post-earthquake). Alternative 1 resolves seismic and river scour issues, and mitigates current and future problems related to dike improvement and ongoing settlement, maintains pipeline capacity and operating flexibility, improves system reliability and avoids additional maintenance associated with other alternatives, such as bathymetric surveys and possible requirement to install rock blanket scour protection. It also avoids future emergency response and pipeline reconstruction in potentially adverse post-earthquake conditions and difficult terrain. These latter issues, which would 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 (Exhibit B-1, p.21).

Alternative 2

TGI states that Alternative 2 comprises the installation of a new NPS 24 crossing using HDD, tying into the existing NPS 24 pipeline on either side of the river, abandoning the existing NPS 24 crossing, and operating and maintaining NPS 20 as per current practice until it either reaches the end of its life or fails in a seismic event and is then replaced (Exhibit B-1, p. 16).

TGI summarizes its conclusions from its review of Alternative 2, and states that it is considered unacceptable due to the significant vulnerability of the remaining NPS 20 to river scour, greater seismic vulnerability of NPS 20, and the added requirement to mitigate the effects of dike improvements and ongoing dike settlement on the remaining NPS 20. The NPS 20 pipeline does not meet TGI seismic or flood design criteria. In addition, a new NPS 24 alone will not fully meet winter capacity requirements throughout the planning period. TGI therefore considers Alternative 2 to carry an unacceptable level of long-term risk (Exhibit B-1, p. 21).

Alternative 3

TGI states that Alternative 3 comprises the replacement of the NPS 20 crossing with a new NPS 20 crossing by installing a new NPS 20 crossing using HDD, tying into the existing NPS 20 pipeline on either side of the river, abandoning the existing NPS 20 crossing, operating and maintaining NPS 24 as per current practice until it either reaches the end of its life or fails in a seismic event and is then replaced (Exhibit B-1, p. 17).

TGI summarizes its conclusions from its review of Alternative 3, and states that it is the option with lowest initial cost, and would replace the one pipeline most vulnerable to erosion and earthquakes. However TGI states that NPS 20 alone is well short of capacity to meet future winter loads, and that prolonged loss of NPS 24's capacity following a strong earthquake will be unacceptable at a time when the LM will depend on natural gas supply for regional economic recovery. That situation would 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 earthquake.

TGI concludes that Alternative 3 will not address the seismic vulnerability of the NPS 24 pipeline, which does not meet its seismic design criterion and that it will not mitigate the effects of dike improvements and ongoing dike settlement on the remaining NPS 24. TGI therefore considers Alternative 3 to carry an unacceptable level of long-term risk (Exhibit B-1, pp. 21-22).

Alternative 4

TGI states that Alternative 4 comprises the replacement of the NPS 20 Crossing with a new NPS 30 Crossing extending from Tilbury Gate Station to Nelson Gate Station by installing a new NPS 30 crossing using HDD, abandoning the existing NPS 20 crossing in place, removing the existing on-land NPS 20 pipeline segments which extend from the crossing to existing facilities at Tilbury Gate Station to the south and Nelson Gate Station to the north, and replacing those segments with NPS 30. In addition this alternative comprises reconfiguring both existing gate stations at Tilbury and Nelson in order to accommodate the NPS 30 pipeline and abandonment of the NPS 20, installing additional facilities for internal inspection of the NPS 30, maintaining the existing NPS 24 pipeline and crossing in service to provide operating flexibility until it either reaches the end of its service life or ruptures upon the occurrence of a seismic event and is subsequently being replaced.
The total length of transmission system replacement in this alternative is 2.8 km, including 1.3 km of additional open trench pipeline installation.

TGI states that the advantages of Alternative 4 are that a new NPS 30 fully complies with all TGI standards, and that the crossing can meet gas demand requirements for the planning period after a strong earthquake in the event the NPS 24 fails (Exhibit B-1, p. 17).

TGI summarizes its conclusions from its review of Alternative 4, and states that, while it would ensure capacity and security of supply following a strong earthquake, it has greater potential for disruption to stakeholders due to the greater physical length of the project

work. Furthermore, Alternative 4 requires that the vulnerabilities, mitigation and emergency response issues associated with the existing NPS 24 be accepted in return for retaining a second pipeline at this critical crossing to retain operating security and flexibility. Finally, TGI states that there is no cost or operating advantage for choosing Alternative 4 over Alternative 1 (Exhibit B-1, p. 22).

3.7 Cost Comparison

TGI sets out the estimated capital costs of the four alternatives:

Appendix 13

Fraser River South Arm Crossing Upgrade Project
Capital Cost Estimates

	Description	Alternative 1 NPS 20 & 24 HDD	Alternative 2 NPS 24 HDD	Alternative 3 NPS 20 HDD	Alternative 4 NPS 30 HDD & Replacement
		Estimate ($2008 millions)	Estimate ($2008 millions)	Estimate ($2008 millions)	Estimate ($2008 millions)
1	Project Services	$ 4.9	$4.0	$4.0	$4.2
2	Land, Temporary Workspace	$ 1.8	$1.1	$1.1	$2.5
3	Pipe & Coating Materials	$ 3.6	$1.9	$1.4	$5.6
4	River Crossing HDD Installation	$ 11.6	$7.0	$6.6	$8.3
5	Pipeline Tie In Construction	$ 2.5	$1.2	$1.0	$3.4
6	Pipeline Commissioning	$ 0.6	$0.3	$0.4	$0.5
7	North Bank Dike Improvements Allowance	$ 1.0	$1.0	$1.0	$1.0
8	Subtotal	$26.0	$16.5	$15.5	$25.1
9	Retirement Costs	$ 0.4	$ 0.2	$ 0.3	$ 0.2
10	AFUDC	$ 0.9	$ 0.6	$ 0.6	$ 0.9
11	**Total Project**	**$27.3**	**$17.3**	**$16.4**	**$26.6**

(Exhibit B-1, Appendix 13)

TGI stated that the -15 percent +20 percent cost accuracy for each Alternative in Table 5.1 was the overall range for the total project cost. The -15 percent +20 percent cost accuracy was not chosen, but rather represented the net result of the accuracy of the available information at the time of

preparation. Since the same base information and project plan was utilized for each of the Alternatives, the same interval range was the outcome (Exhibit B-3, BCOAPO 1.3.1).

TGI also stated that it "believes the cost estimates provided in the Application are within an acceptable accuracy range to be able to compare between alternatives and for stakeholders and the Commission to understand the relative impact on ratepayers" (Exhibit B-5, BCUC 2.12.7).

TGI states that the contemporaneous installation of two new crossings is considerably less costly than would be the case with separate mobilizations, and it calculates that it would capture savings of at least $6 million by constructing both crossings at once, compared with replacing one now and the second at some later date.

In addition, TGI states that replacing both crossings during one contractor mobilization will reduce future siting and permitting risk. TGI also recognizes that there will continued development in the area on both sides of the river and therefore gaining approvals and access to the ROW and temporary construction space in the future will become increasing more difficult and could add significantly to costs of doing the second replacement (Exhibit B-1, p. 21).

In addition TGI calculates the impact of its Application on its per GJ cost of service in the years 2010 to 2029 to be $0.014/GJ in 2010 declining to $0.011/GJ in 2029 (Exhibit B-1, Appendix 12).

3.8 Non-Financial Evaluation

In response to a Commission IR to provide a schedule that compared Alternatives 1 through 4 (plus Alternative 4 using a NPS 36 inch crossing which was dubbed Alternative 5), TGI performed a non-financial comparison of the alternatives, using the following criteria:

1) vulnerability, which took into account potential for pipeline failure due to external hazards (seismic event, river erosion, soil settlement (dike improvements));

2) safety concerns, which took into account into account the risk to the public in the event of a pipeline failure and the risk to TGI with respect to any scheduled maintenance or emergency repair work required;

3) environmental, which considered the level of impact during construction and post construction pipeline operations the alternatives have on the surrounding environment including off-shore activities, environmentally sensitive areas and agricultural land;

4) effect on property, which took into account the effect that the construction activities will have on any surrounding land owners, such as loss of business and land use restrictions;

5) First Nations, which considered the effect of the project on the cultural values, economic well being and quality of life of First Nations citizens;

6) operational flexibility, which considered the availability of a second pipeline crossing for O&M or emergency requirements; and

7) post-earthquake gas load capacity, which considered the ability to meet gas demand within the 20-year planning period, immediately following a strong seismic event (in which the pre-existing pipelines would fail).

Non financial evaluation Table

(1 = Low; 3 = Moderate; 5 = High)

	Criterion	Weight	Alternative 1 - NPS 20 and 24 Replacement by HDD		Alternative 2 - NPS 24 Replacement by HDD		Alternative 3 - NPS 20 Replacement by HDD		Alternative 4 - NPS 30 HDD		Alternative 5 - NPS 36 HDD	
			Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
1	Vulnerability											
	1.1 - Seismic	25	5	125	1	25	2	50	2	50	2	50
	1.2 - Erosion	10	5	50	1	10	4	40	4	40	4	40
	1.3 - Settlement (Dike)	2	5	10	2	4	2	4	2	4	2	4
2	Safety	20	5	100	1	20	1	20	2	40	2	40
3	Environmental	3	5	15	3	9	3	9	2	6	1	3
4	Effect on Property	4	5	20	4	16	4	16	2	8	2	8
5	First Nations	2	3	6	3	6	3	6	3	6	3	6
6	Operational Flexibility	4	5	20	4	16	4	16	2	8	2	8
7	Post Earthquake Capacity	30	5	150	2	60	1	30	5	150	5	150
8	**Totals**	**100**		**496**		**166**		**191**		**312**		**309**
9	**Ranking**			**1st**		**5th**		**4th**		**2nd**		**3rd**

(Exhibit B-2, BCUC 1.11.1)

TGI submits that "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" (TGI Argument, para. 15) and "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" (TGI Argument, para. 23).

3.9 Economic Analysis

In response to BCUC 1.18.1 requesting an economic analysis (in fully functioning Excel spreadsheet format) of the 4 HDD alternatives considered and a "status quo" scenario, TGI performed a discounted cost of service analysis comparing the status quo with the four alternatives (Exhibit B-2, BCUC 1.18.1). In response to BCUC 2.11.1 TGI performed an analysis comparing the incremental cash flows of the four alternatives with the cash flow of the status quo (Exhibit B-4, BCUC 2.11.1).

3.10 Discounted Cost of Service Analysis

TGI stated that in order to respond to the IR it had assumed that the end of the useful life for each crossing was 60 years, and that in the absence of this Project the NPS 20 would otherwise be replaced in 2018, and the NPS 24 replaced 16 years later in 2034, and stressed that this was an assumption for the purpose of this response only to demonstrate the financial impact of deferring the replacement of the one or both crossings. TGI provided the following Table which set out the Present Value ("PV") of the cost of service of each alternative compared to the status quo:

Alternative	PV ($m)
"*Status quo*:" Replace NPS 20 and NPS 24 in 2018 and 2032 respectively using HDD, estimate costs to mitigate erosion vulnerability and of dike settlement	19.7
Alternative A: Replace NPS 20 and NPS 24 now using HDD as proposed in the Application.	26.8
Alternative B: Replace NPS 24 immediately. Replace NPS 20 in 2018 using HDD, estimate costs to mitigate erosion vulnerability and of dike settlement	32.9
Alternative C: Replace NPS 20: Replace NPS 24 in 2034 using HDD, estimate costs of dike settlement	19.8
Alternative D: Replace NPS 20 with new NPS 30: Replace NPS 24 in 2032 life using HDD, estimate costs of dike settlement	29.9

(Exhibit B-2, BCUC 1.18.1)

This was not responsive to BCUC 1.18.1, and required a second analysis, described below:

3.11 Incremental Cash Flow Analysis

TGI provided the following Table which set out the Present Value ("PV") of the cost of service of each alternative compared to the status quo:

NPV / LEVELIZED RATE	PV	ALT PV - STATUS QUO	LEVELIZED RATE ($/GJ)
STATUS QUO	$ 19,780,159		
ALTERNATIVE A	$ 21,028,555	$ 1,248,396	$ 0.0004
ALTERNATIVE B	$ 27,127,413	$ 7,347,254	$ 0.0026
ALTERNATIVE C	$ 17,288,580	$ (2,491,579)	$ (0.0009)
ALTERNATIVE D	$ 24,855,674	$ 5,075,515	$ 0.0018

In addition, TGI was asked to discount the throughput volumes and to divide the difference between the PV of the Status Quo and its chosen alternative by the discounted throughput to ascertain the levelized difference which it calculated to be four hundreds of one cent per GJ. TGI stated that in order to perform this analysis it:

- included O&M cost differences, though minor, in the analysis which related to river bed inspections;
- assumed, for the purposes of the 50-year analysis, zero terminal values for the pipeline assets;
- assumed the discount rate to be the nominal after tax Weighted Average Cost of Capital ("WACC"), using for the cost of debt and Return on Equity the 2009 approved rates of 6.72 percent and 8.47 percent, respectively; and
- assumed the corporate tax rate declined from the current 30 percent to 26 percent through 2012 and remained constant thereafter, which caused the after tax WACC to increase from 6.02 percent to 6.20 percent during that period and to remain at 6.20 percent thereafter.

(Exhibit B-4, BCUC 2.11.1)

TGI comments on the Commissions request in BCUC 2.11.1 that it comment on the suggestion that this project is an investment in "earthquake insurance", and submits that "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. All system maintenance expenditures must be assessed with regard to the safety 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" (TGI Argument, para. 11).

TGI submits that "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" (TGI Argument, para. 17), and points to the non-financial ranking matrix which "identifies Alternative 1 as having the highest overall ranking, by a considerable margin" (TGI Argument, para. 25).

BCOAPO submits that TGI's evidence is that of the four HDD alternatives considered, only Alternative 1 (replacing both pipes) addresses seismic, erosion, and dike settlement vulnerabilities, and that, "given the evidentiary basis provided by TGI, including reports by independent engineering firms, BCOAPO has no basis to dispute TGI's determination that (i) this project is non-discretionary and (ii) the alternative proposed is in the public interest" (BCOAPO Argument, paras. 7, 14).

4.0 PROJECT DESCRIPTION, COSTS AND RISK

This section reviews TGI's selected alternative, its schedule, the team TGI has assembled to execute the Project, any permits or approvals required, the Project's cost estimate, the Project's risks and TGI's proposed reporting format.

4.1 Description of Project

TGI states that it is applying to replace its existing NPS 20 and NPS 24 transmission pipelines across the South Arm of the Fraser River with new NPS 20 and NPS 24 lines installed using HDD. The two new crossings, each approximately 1,400 m in length, will be constructed within the existing ROW, both on land and across the river at depths significantly below the existing crossings. The construction will require the temporary shut down of each pipeline while it is being replaced; however, the other pipeline will have sufficient capacity during the construction period to supply downstream customers (Exhibit B-1, p. 7).

TGI sates that the methodology requires temporary "set-up" areas on both sides of the proposed crossing. On the entry side, a drilling machine is positioned. This machine, using GPS guidance technology, first drills a small diameter pilot hole between the entry and exit points. This is followed by a second drilling process which enlarges the pilot hole to a diameter larger than the pipeline to be installed.

On the opposite side of the proposed crossing (the exit point) a pipe "lay-up" area is required. The space requirements on this side are considerably larger since this area is used to weld together the pipe for the eventual crossing. The drilling machine is then used to pull the pipe through the previously enlarged hole.

The final step involves "tie-ins" to the existing pipeline upstream and downstream of the entry and exit points (Exhibit B-1, p. 23).

4.2 Project Schedule

TGI states that the Project will be undertaken from 2008 to early 2010 with specific activities and durations as follows:

Activity	Duration
Concept Development	January – September 2008
Detailed Engineering	August 2008 – May 2009
CPCN Preparation and Approval	July 2008 – March 2009
Tendering (Materials)	November 2008 – February 2009
Tendering (HDD)	November 2008 – March 2009
Construction	June 2009 – October 2009
In Service	November 2009
Site Restoration	September 2009 – May 2010

TGI states that the current schedule assumes that construction will occur in 2009, however the Project team has allowed for 2010 construction if following evaluation of tenders for the HDD work it is determined to be more cost effective (Exhibit B-1, p. 27).

TGI stated that it expects to make the decision in May 2009 whether 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 [schedule] 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 (Exhibit B-4, BCUC 2.12.5).

In a response to a Commission IR issued in January 2009, TGI stated that "based on the present status of design, procurement, stake-holder negotiations, and permitting, TGI believes that project completion in 2009 is reasonably feasible." TGI stated that the choice of a 2010 in-service date would depend on a number of factors:

- bid price, which would only be ascertained by tendering both options;

- contractor capability, since obtaining a contractor with proven operators and supervision is central to minimizing completion risk for this highly specialized work, and only by tendering both options can the most advantageous bids be determined;

- TGI's Project team, which is staffed and currently has very good momentum, and where delay into 2010 would require the team to re-orient and would also bring a greater risk of turnover for internal resources and consultants;

- permitting and landowner agreements, where a 2010 schedule offers some additional time for negotiations, but TGI would not expect any net benefits to be significant;

- tie-ins, where a 2010 schedule offers more flexibility and avoids potential delay of the tie-ins, as might occur in extended cold weather during winter 2009;and

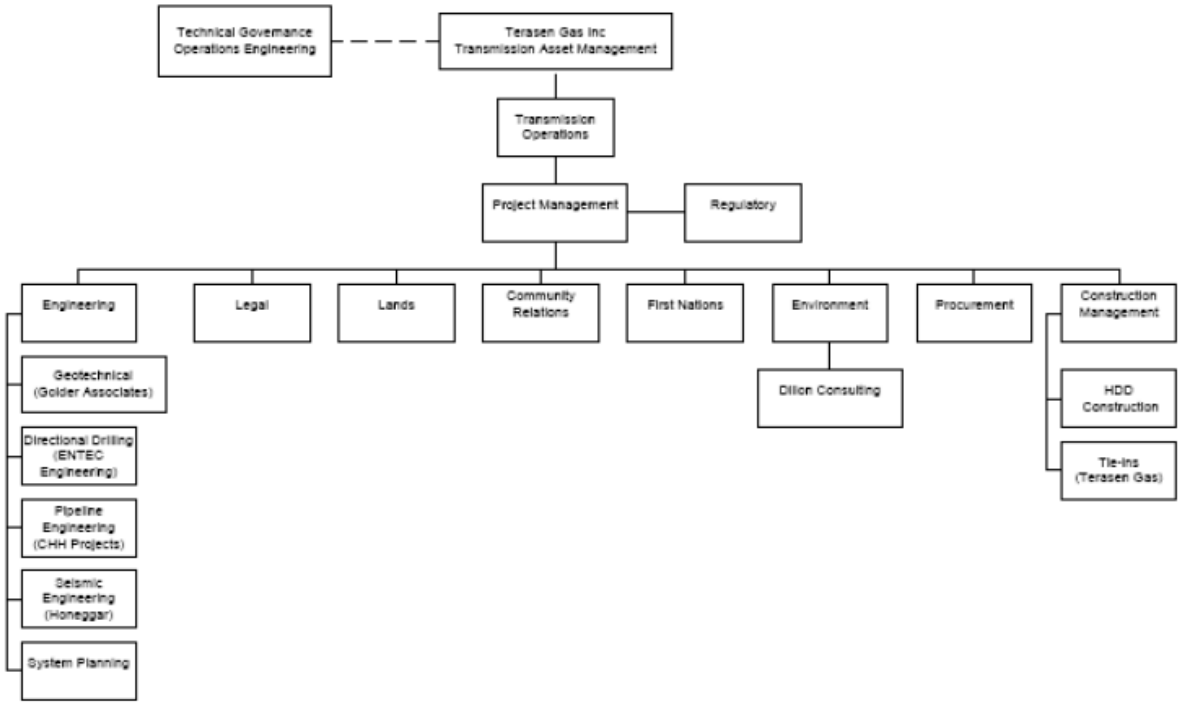
- pipeline integrity issues, where a 2010 schedule would extend the risk of pipeline failure from a seismic event for nine extra months, expose the crossings to scouring from one additional spring freshet and extend the risk of possibly requiring additional temporary mitigation efforts to minimize soil loads and accommodate dike requirements.

(Exhibit B-4, BCUC 2.12.6)

4.3 Project Team

TGI provides the following organization chart that it proposes to manage the Project:

Figure 7.1: Project Functional Organization Chart



(Exhibit B-1, p. 35)

TGI states that its in-house engineering resources will be utilized for the design of the land-based pipelines and tie-ins, while the specialized services required for environmental management, geotechnical investigation and analysis, HDD pipe and profile design, and construction inspection will be contracted to individuals and companies possessing the demonstrated skills and experience to complete the work. These individuals and companies will be expected to ensure that public and worker safety, quality workmanship and environmental compliance are maintained throughout this Project.

TGI states that its operating personnel will ensure that all facilities are efficiently placed into operation upon completion of construction, and conform to TGI standards and industry practices (Exhibit B-1, p. 35).

4.4 Permits and Approvals

TGI attaches a report dated September 16, 2008 from Dillon Consulting Limited ("Dillon") whom it retained to provide environmental consulting services, which addresses permitting issues, including agency consultation and timing windows (Exhibit B-1, Appendix 8).

4.5 Design, Construction and Operations

TGI states that the design, construction and operation of the subject river crossing pipelines are subject to the *British Columbia Pipeline Act and Regulations,* and fall under the jurisdiction of the Oil and Gas Commission ("OGC"). Design, construction and operating approvals for the Project have been discussed with the OGC, and these will be obtained as required (Exhibit B-1, p. 34).

TGI stated that it anticipated that the permitting for the proposed HDD river crossings would follow existing and routine permit application processes, and that it has not identified regulatory permitting processes for the Project that would require an extended timeline. In the event that predecessor activities such as receipt of permits have not been completed by July 2009 or later, and if consequently TGI forecasted that achieving a November 1, 2009 in-service milestone for both pipelines was unlikely to occur, and that adverse impacts could be mitigated, TGI stated that it would defer the construction phase to start on, or about, May 2010 (Exhibit B-2, BCUC 1.19.1).

4.6 Site Rezoning and Land Rights Purchase

TGI states that site rezoning is not required for the Project, since the new pipelines will be wholly installed within its existing ROW, and additional temporary working space will be negotiated as required with the land owners. TGI states that it has completed preliminary discussions with land owners regarding temporary working space (Exhibit B-1, p. 34).

4.7 Water Crossing

TGI states that all waters classified as fish habitat are protected by the federal *Fisheries Act*, which is administered by the Department of Fisheries and Oceans ("DFO"). TGI states that it will apply to DFO to determine whether the activities associated with the Project should also be referred to Fraser River Estuary Management Program ("FREMP") for project review. TGI states that it has held preliminary discussions with DFO and FREMP, and that it expects the Project will receive a favourable review, given that no work is expected to occur within fish habitat; i.e. "no-net loss" of fish habitat can be achieved (Exhibit B-1, p. 34).

Dillon advises TGI that the timeline for DFO review and potential referral of HDD activities to FREMP is expected to be relatively brief (*i.e.,* 30 to 60 days). Review and approval timelines for the terrestrial based works *(i.e.,* drill string lay-down) will vary depending on the degree of impact (if any) to environmentally-sensitive areas within the Project Area (Exhibit B-1, Appendix 8, p. 11).

TGI states that it will be required to notify Fraser River Port Authority ("FRPA") for the Project, and that it expects FRPA to process the notification via its "Track 1" process given that the Project's activities are of a predictable nature with little or no impact (Exhibit B-1, p. 34).

Dillon advises TGI that FREMP uses a two-track process to review projects in the Fraser River Estuary, with Track 1 projects being dealt with by FRPA (as above), while Track 2 projects (projects of a more complex nature with potential impacts) are reviewed by FREMP's environmental review committee and typically take 30-days to complete (depending on project complexity).

In the event that FREMP receives the notification (triggered by either FRPA or DFO), and provided there is no significant disturbance to near shore or foreshore areas of the Fraser River, Dillon advises that it is likely that it will require a list of Best Management Practices be applied to the proposed HDD works (Exhibit B-1, Appendix 8, p. 11).

TGI states that an approval submission to Transport Canada (Navigable Waters Protection Division) will likewise be required for this project (Exhibit B-1, p. 34).Dillon Consulting anticipates that the timeline for project review will be less than 45-days (Exhibit B-1, Appendix 8, p. 11).

Dillon Consulting advises TGI that an application for approval under Section 9 of the provincial *Water Act* must be submitted to the OGC which had indicated that the "project review would be brief (*i.e.,* 30 days) given the low-risk nature of the proposed activities" (Exhibit B-1, Appendix 8, p. 11).

Dillon Consulting advises TGI that the Project will also be subject to consideration under the provincial *Wildlife Act*, section 34 of which prohibits the disturbance of nests that are occupied by birds, eggs or fledglings during the bird nesting window (April 1 to July 31 in the LM). If drill string or reservoir pit construction is proposed for this window and there is a potential to disturb bird nesting habitat as a result, assessment of impacted vegetation will be required immediately prior to initiation of works (Exhibit B-1, Appendix 8, p.11).

4.8 Capital Cost

TGI states that the total capital cost of the project is estimated to be approximately $27.3 million ($2008) based on preliminary project definition and design with the individual cost elements consisting of historical costs, non-binding quotations and projections. The expected accuracy of the cost estimate is -15 percent to +20 percent.

TGI sets out the cost elements as follows:

Table 6.1 Capital Cost

	Alternative 1; NPS 20 and NPS 24 HDD Replacement	Estimate ($2008 millions)
1	Project Management, Engineering, Consultation, Inspection	$ 4.9
2	Land Utilization, Temporary Workspace	$ 1.8
3	Pipe & Coating Materials	$ 3.6
4	River Crossing HDD Installation & Pipeline Construction	$ 11.6
5	Tie In Construction	$ 2.5
6	North Bank Dike Improvements Allowance	$ 1.0
7	Operations & Commissioning	$ 0.6
8	Sub- Total	$ 26.0
9	Retirement Costs (existing NPS 20 and NPS 24)	$ 0.4
10	AFUDC	$ 0.9
	Total Project	**$ 27.3**

TGI points out that all capital cost estimates are based on an in-service date of November 2009 and include all engineering, procurement and construction costs, regulatory and environmental costs, and workspace acquisition costs. The costs of steel pipe were based on a July 2008 quotation and are subject to market variation (Exhibit B-1, pp. 25-26).

TGI compared the difference between the estimated cost of $9.75 million in its 2008 Resource Plan and the Application's estimate of $27.3 million and attributed it to the following reasons:

- the 2008 Resource Plan was developed in anticipation of achieving the recommendations as summarized in the 2007 Golder Report, and assumed replacing the NPS 20 crossing only. Subsequent to the preparation of the Resource Plan, and as preparatory design work to implement the recommendations, the 2008 Golder Report was commissioned. The 2008 Report resulted in a change to the river crossing upgrade recommendations and the Application proposes to replace both the NPS 20 and NPS 24, based on updated studies and evaluation; and

- the two cost estimates use different bases with the Application estimate being prepared against a preliminary construction plan to meet the Project goals, while the 2008 Resource Plan estimate used a conceptual description of the scope of work, and failed to take into account numerous Project specific items (BCUC 1.15.1).

TGI states that its were based on the most recent studies and information available to it and used current market prices for the expected contracted construction services, materials, and heavy-wall line pipe. The HDD contract estimate is based on construction during the spring, summer or fall seasons, as construction during the winter is typically 5-15 percent more costly. The cost estimates include allowances for the rental of workspace and procedures to minimize impacts to local businesses.

TGI states that it is "committed to minimizing the rate impact associated with this Project and proposes to: (i) structure the HDD contract as being conditional upon Commission review and approval; (ii) schedule the project to avoid higher winter prices for HDD, (iii) file a revised control budget accounting for new information; and (iv) file with the Commission quarterly project progress reports and a project completion report in a form developed in conjunction with Commission staff" (Exhibit B-1, p. 26).

TGI stated that its range of accuracy meant that the likely final cost lay in the $23.1 to $32.8 million range ($2008) (Exhibit B-2, BCUC 1.5.8).

TGI addressed the expected accuracy range of -15 percent to +20 percent and stated that its contention that the final cost would fall within that range was not based on a cost risk analysis (Exhibit B-2, BCUC 1.5.7), but rather that the -15 percent +20 percent cost accuracy was the overall range for the total project cost, and was not chosen, but rather represented the net result of the accuracy of the available information at the time of preparation (Exhibit B-3, BCOAPO 1.3.1).

TGI stated that, having developed the estimate by identifying major items of work in the Project plan, using non-binding quotations, historical costs and forecasts with an allowance for as yet undefined costs in the major items, it did not include a specific line item for contingency in the estimate, as it considered that this would represent "a double accounting of the risk allowance within the estimate at this stage."

TGI stated that it proposes to prepare a control estimate with contingency using statistical risk analysis techniques following detailed design engineering, material and construction tendering, and negotiation of landowner workspace agreements (Exhibit B-3, BCOAPO 1.2.1).

TGI stated that it could not guarantee that the new budget would be within the -15 percent to +20 percent range since the control budget was, to a significant degree, a function of the HDD contract price and the subsequent cost risk analysis (Exhibit B-4, BCUC 2.12.7).

TGI stated that it has used "range of accuracy" or deterministic cost estimates, as used in this Application, for many years, and that the probabilistic method (including range estimation) has also been used at TGI, as has a combination of both methods. The decision of which estimating method to use for a particular project was made considering many factors which included:

- whether project uncertainties could be readily identified;
- how identified uncertainties could be captured in a cost estimate; and
- whether the project development process required a risk-based estimating method.

TGI suggested that it was customary for projects to utilize different estimating methods at different stages of their lifecycle, such that they may begin with a deterministic estimate, evolve to a probabilistic method to capture risk costs and uncertainties, and then revert to deterministic estimates for the day to day cost control and project execution (Exhibit B-4, BCOAPO 2.9.2).

BCOAPO submits that it has begun to see a trend of project costs increasing significantly beyond the high case estimates found in the original application (adjusted for inflation). Adding to this concern is the dramatic jump in TGI cost estimates for this particular project between June 2008 ($9.75M excluding AFUDC) 16 and November 2008 ($27.3M with a range of -15 percent to +20 percent) (BCOAPO Argument, para. 15).

TGI submits in its Reply that BCOAPO's assertion is made without citing any evidence and that despite BCOAPO's perception, "the evidence in this Application demonstrates that actual costs incurred by TGI to complete recent projects have been within or below the initial cost estimate range, with the exception of the Port Mann HDD project" (TGI Reply, para. 6).

TGI addresses the increase in the Project cost estimates between the estimated cost of $9.75 million (excluding AFUDC) in the 2008 Resource Plan and the estimate of $27.3 million in the Application, pointing out the most significant factor leading to the increase is that the 2008 Resource Plan estimate was developed based on a previous generation of geotechnical engineering knowledge that suggested the replacement of the NPS 20 crossing only, and submitting that "once the cost of a second (larger pipe diameter) crossing has been accounted for, the difference between the estimates is in fact quite modest" (TGI Reply, para. 7).

4.9 Project risks

TGI identifies the following primary Project risks to cost and schedule, and its strategies for their control or mitigation in the following table:

Table 6.3 - Project Execution - Risk Control Summary

KEY RISK	CONTROL / MITIGATION
Project Management	Upon approval of the Project, a Project Execution Plan will be issued to detail risks and mitigation strategies, including a Control Budget based on material and HDD/Pipeline construction tenders.
Stakeholder Impacts	Regular collaborative communication with all internal and external stakeholders throughout duration of the Project.
Construction Schedule	Analyze requirements and the feedback from tenders to determine whether 2009 In-service Target is reasonably achievable, or that 2010 completion target is better.
Engineering / Construction Resources	Use Terasen internal resources combined with consultants who have proven skills, HDD experience and availability.
Material Cost / Delivery	Tender to known vendors and award to the lowest qualified bidder.
HDD / Pipeline Contract Cost	Optimize Total Contract Price via: 1) Lump Sum cost components for surface activities that can be best managed by the contractor; and 2) Unit Rates for unforeseen or variable subsurface risks to be shared between the contractor and Terasen (e.g. mud fractures or extreme weather).
HDD / Pipeline Contractor Capability	Tender to known contractors with proven experience; award to the lowest qualified bidder.

TGI observes that for HDD contracts, there will always remain some uncertainty with respect to subsurface conditions, but states that it has conducted detailed geotechnical investigations along the drill path, and that it expects that the geotechnical baseline report it proposes to give to the HDD contractors will reduce the uncertainty regarding subsurface conditions. TGI states that it will attempt to trade off risk for cost in designing procurement documents and will seek to structure the tender documents for the HDD contract in such a way as to arrive at an appropriate balance between price and the retention of some risk (Exhibit B-1, p. 28).

TGI cited the Port Mann HDD project as one which exceeded the estimated cost primarily due to significant geotechnical challenges that had not been anticipated by the HDD drilling contractor, and ensuing litigation with the HDD drilling contractor over contractual responsibility for the unanticipated challenges. There will always be some risk of unforeseen conditions on an HDD project, although TGI has done extensive geotechnical work on this Project to minimize that possibility (Exhibit B-5, BCOAPO 2.9.3).

TGI discussed the allocation of risk, stating that the unforeseen or variable subsurface risk will be shared between it and the HDD contractor by setting out construction specifications that define the HDD operational risks that are within and without the contractor's control. TGI stated that it would share with the HDD contractor those cost risks associated with subsurface conditions which are not identified in or can be reasonably inferred from the geotechnical reports, and cited the example of encountering seams of gravels or boulders along the drill path which were not identified in the subsurface investigations, which would cause a loss of circulation of drilling fluid despite the HDD contractor having followed best practices (Exhibit B-2, BCUC 1.6.2).

TGI stated that the contract with the HDD contractor will:

- require the HDD contract to assume all of the risk for its own equipment reliability, personnel competency and any problems caused by its failure to remain within the tolerances of the HDD design and specifications;

- require TGI and the HDD contractor to jointly manage construction activities and operational delays that result in an increased construction schedule beyond the base contract schedule, due to unforeseen subsurface conditions; and

- develop a lump sum arrangement for the base schedule, such that there will be a financial incentive for the contractor to effectively complete its work ahead of the time specified in the contract. Beyond the base schedule, the cost risks will be shared by TGI and the contractor in the form of tendered operating rates on a shift or day basis, consumables and third party expenditures multiplied by the jointly agreed time or quantities.

TGI stated that any delays due to unforeseen or variable subsurface conditions are likely to be non-routine and with low frequency, observing that, to minimize the risk, it had conducted extensive geotechnical investigations and had confidence that the costs above the base HDD contract attributable to the unforeseen ground conditions sharing mechanism will not be a significant risk to Project costs.

TGI stated that the likely range of sharing and the resulting range of cost exposure to it and its ratepayers would be addressed in the cost risk analysis as part of the development of the control budget (Exhibit B-2, BCUC 1.6.2)

TGI addressed the apportionment of unforeseen or variable subsurface risk between it and the HDD contractor, stating that it will be evaluated as part of the tender process prior to finalizing the HDD contract. TGI reiterated its belief (i) that a fair apportionment of risks provides appropriate incentive to the contractor to manage its resources prudently in order to mitigate cost effectively the impact of any unforeseen subsurface risk to the final Project costs, and (ii) that the most effective HDD contracting strategy was one that incorporated a pricing strategy that included:

- lump sum components for defined items of work that are in the contractor's control such as mobilization, site security, worksite preparation, drilling, and pipeline testing;

- unit price components where the specification of the work was fixed, the contractor was in control of the work, but the quantity will be variable such as casing installation, drilling cuttings disposal, supply of drilling fluids, and supply of granular materials; and

- unit price components and set mark ups for jointly agreed upon scope of work changes to the base contract for such activities such as to manage any subsurface changes, shut downs for adverse weather conditions, and land owner accommodations.

TGI stated that it believed that its proposed HDD contract pricing structure would provide for the most cost effective approach for balancing construction risk sharing and project cost (Exhibit B-2, BCUC 1.6.3).

4.10 Control Budget

TGI states its commitment "to minimizing the rate impact associated with this non-discretionary Project. Therefore, TGI proposes to: (i) structure the HDD contract as being conditional upon Commission review and approval; (ii) at the same time, file a revised control budget accounting for new information; and (iii) file with the Commission quarterly project progress reports and a project completion report in a form developed in conjunction with Commission staff" (Exhibit B-1, p. 26).

TGI stated that it will complete a cost risk analysis that can be used to determine P10 to P90 confidence levels at the same time as the development of the control budget, which will incorporate new information, including the contractor bid that TGI has selected for the directional drill portion of the work. TGI undertook to include the results of the cost risk analysis and a comparison to the current -15 percent to +20 percent range with that submission (Exhibit B-2, BCUC 1.5.7).

TGI stated that it expected that the control budget will be within the -15 percent to +20 percent range, since it 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. Nevertheless, TGI believes the cost estimates provided in the Application are within an acceptable accuracy range …. for stakeholders and the Commission to

understand the relative impact on ratepayers" (Exhibit B-4, BCUC 2.12.7).

TGI stated that, in preparing the responses to the second round of IRs, it further considered the issue, and concluded that a condition that the Commission review and approve the revised control budget prior to the project proceeding should only be necessary if the revised estimates exceed the current -15 percent to +20 percent range of estimates provided in the Application.

TGI proposed the following schedule for the Commission approval process based on a 2009 construction schedule noting that the HDD contract may be executed prior to filing of the revised control budget; however, it will be conditional and the condition will not be waived or fulfilled by TGI until the revised control budget has been filed (if within the estimate range) or accepted (if above the estimate range). Likewise, the signing of contracts for materials and land use may be completed as those arrangements are put in place, however TGI will endeavour to minimize any cost obligations under those agreements until such time the revised control budget is completed. Lastly TGI stated that the tendering and evaluation of service and material contracts was consuming a significant commitment of resources and expenses, which was why TGI was requesting approval of the Project at the earliest practical date.

Activity	Estimated Date
• Commission approval of CPCN	March 5, 2009
• Completion of HDD contract	June 1, 2009
• Filing of report with revised control budget and description of contracts	June 1, 2009
• TGI waiver of condition on HDD contract (if control budget within estimate range)	June 15, 2009
• Commission acceptance of the	June 15, 2009

revised control budget (if budget exceeds estimate range)	
• Signing of contracts for purchasing line pipe and other materials	As required
• Signing of agreements for land and workspace	As required

(Exhibit B-4, BCUC 2.12.8)

TGI stated that it is requesting that the Commission issue final approval to proceed with the Project based on the evidence provided in the Application except in the case where the revised control budget exceeds the estimate range in this Application. "TGI has proposed that, in such cases, the Commission review and approve the revised control budget. While Commission review of the control budget is not, strictly speaking, *necessary,* TGI made this proposal to demonstrate good faith and add even greater transparency" (Exhibit B-4, BCUC 2.12.11).

TGI submits "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" (TGI Argument, para. 37).

BCOAPO submits that its primary concern with the Application is the significant cost risk that will ultimately be borne by TGI's ratepayers and that any approval given at this time should not be interpreted as endorsing the Control Budget as reasonable in the absence of any further discovery process: "it is, after all, a document no one has yet seen with contents we cannot begin to know. The tendering process will have concluded by March 2009, and BCOAPO expects that the control budget will be submitted to the Commission shortly thereafter."

BCOAPO submits that the Commission should ensure that this ratepayer risk is appropriately mitigated by approving the CPCN Application with a hard cost collar equal to the high end of TGI's current estimates ($27.3M + 20 percent). BCOAPO supports an incentive to the utility to be realized should the project costs come in significantly below the current base case estimate, as was the case in the Southern Crossing Pipeline.

BCOAPO further suggests that additional discovery should be triggered if the control budget estimate is higher than 10 percent above the current base case estimate of $27.3M. This will ensure that intervenors and Commission staff have an opportunity to explore, among other things, the potential of a risk sharing mechanism similar to that in the TGVI/TGW Whistler Pipeline (BCOAPO Argument, para. 16-18).

TGI addresses BCOAPO's request for more process and submits that that there is no benefit to be obtained from requiring additional process if the control budget is still within the proposed estimate range as the estimates provided in the Application are within an acceptable accuracy range for the Commission to assess the public interest of the Project and to confirm the appropriateness of the selected Project alternative. TGI also submits the "additional discovery" will effectively eliminate any possibility of proceeding with a 2009 construction window, and frustrate its objective of having contractors bid based on a 2009 and 2010 construction window to increase the prospects of obtaining lower bids (TGI Reply, para. 9)

TGI submits that the additional mechanisms it proposed, such as preparing a revised control budget, obtaining approval of the revised control budget if it exceeds the current +20 percent estimate, and quarterly reporting, together with the potential for a prudency review following the completion of the Project, "are more appropriate means of ensuring cost transparency" (TGI Reply, para. 11).

Addressing BCOAPO's suggestion of a risk-sharing mechanism TGI submits that the Project is not conducive to the employment of a risk-sharing mechanism, as the largest project risk is geotechnical uncertainty which will be managed through the contract design, and potential overruns due to such risks are not within the control of TGI (TGI Reply, para. 10).

TGI reserves the bulk of its Reply for BCOAPO's proposal for a "Hard Cost Collar", and submits that a cost capping mechanism is inappropriate regardless of whether an incentive is provided to TGI to reduce costs below the current estimate range. TGI submits that "All costs prudently incurred in the construction of this Project should be recoverable in rates" (TGI Reply, para. 12).

TGI cites the steps it has taken, *ex ante,* to manage cost risk on this Project and reiterates the ability of the Commission to require an after-the-fact prudency review if it appears that TGI has not acted prudently in its management of the Project.

TGI contends that BCOAPO's proposed "cost collar" would result in it attempting to allocate more risk to its contractors and suppliers, which may be beyond their reasonable control and for which they could be expected to charge it disproportionately more, which "translates directly into higher Project costs" … and "is not necessarily the most cost effective result for customers" (TGI Reply, para. 14-15).

TGI submits that BCOAPO's proposed "cost collar" is contrary to the *Utilities Commission Act*, section 60 of which provides that, if TGI provides adequate service, it must be provided with a reasonable opportunity to receive a fair and reasonable return for that service.

TGI submits that cost caps such as BCOAPO's proposed "hard cost collar" would deny its shareholders a reasonable opportunity to earn a fair return on their invested capital if the prudently incurred expenditures on the Project ultimately exceed the cost cap, and observes that had BCOAPO's proposed "hard cost collar" been imposed by the Commission on the Port Mann project, it would have been prevented from recovering prudently incurred costs on a project that the Commission had previously determined to be in the public interest.

TGI submits that “cost caps such as the “hard cost collar” proposed by BCOAPO are inappropriate, and would be counterproductive. TGI will not agree to the proposed "hard cost collar" on this Project” (TGI Reply, para.16-18).

5.0 CONSULTATION AND COMMUNICATION

5.1 Communication

TGI reports that it has undertaken initial stakeholder discussions through its communication and consultation program with the following objectives:

- identification of community stakeholders as a means of better facilitating the communication of project purpose;
- provision of a means to respond to raised issues and public inquiries; and
- provision of a basis for information gathering which will be useful in assisting TGI with the development of plans to schedule, construct and finally operate the pipeline.

(Exhibit B-1, p. 31)

The list of project stakeholders identified by TGI includes the following:

- Affected property owners or lessees;
- City of Richmond;
- Richmond Chamber of Commerce;
- Delta Chamber of Commerce;
- Corporation of Delta;
- Canadian National Railway / Burlington Northern Santa Fe Railway / CP Railway;
- Metro Vancouver (formerly Greater Vancouver Regional District);
- Provincial Dike Authority;
- Fraser River Port Authority;
- Fraser River Estuary Management Program;
- Ministry of Environment (“MOE”);

- Dept of Fisheries and Oceans;
- First Nations (see below);
- Oil and Gas Commission;
- Agricultural Land Commission; and
- Transport Canada (Navigable Water Protection Division).

(Exhibit B-1, pp. 31-32)

TGI reports that it has had initial meetings and/or discussions with each of these and key stakeholders have voiced support for the project and identified no "show stoppers". However, TGI acknowledges there have been concerns raised such as: temporary loss of parking, vehicular access, site restoration/remediation, access or utility disruption and noise impacts associated with the movement of support vehicles and overall construction, which it is confident can be mitigated. (Exhibit B-1, p. 32).

TGI states that what it has done to this point with respect to consultation and communication has been appropriate and it intends to continue to remain inclusive and proactive with respect to stakeholders and to provide this key group with Project updates and reports on an as needed basis and to work with them directly throughout the process. With respect to issues of public safety, schedule, ROW, temporary construction space, access and accommodation TGI will continue to consult with property owners and lessees. Because the Project is being undertaken on fee simple land which has been previously disturbed, TGI notes that what has been undertaken to date with First Nations is both appropriate and adequate (Exhibit B-1, p. 33).

The City of Richmond states in a letter of comment that it has already been contacted by Terasen Gas in relation to this project. "We appreciate their proactive approach to consultation, and look forward to working together to the successful completion of this project" (Exhibit C3-2).

5.2 First Nations

TGI points out that the Project is on private fee simple land which is part of the ROW and does not impact Crown or Indian Reserve Land. It further reports that all of the land being worked on has been previously disturbed and studies have failed to identify any archaeological sites within the Project area. TGI states that it has contacted the three First Nations (Tsawwassen First Nation, Katzie First Nation and Musqueam First Nation) who have archaeological interests in the area to provide information on the proposed project but, to date, none has responded by identifying any issues (Exhibit B-1, p. 32).

TGI addresses the Commission's first question in Exhibit A-6 "Does the Crown's duty to consult and, if necessary, accommodate arise in the circumstances of this application" and submits that the Crown's duty to consult does not arise in the circumstances of this application. TGI submits that there is no evidence before the Commission that would indicate that the duty to consult and, if necessary accommodate arises with respect to the Project. TGI submits that the Project will only impact private fee simple land that contains TGI's statutory ROW on both sides of the Fraser River and it will not impact Crown or Indian Reserve land, and that these two factors differentiate this case from the circumstances in *Kwikwetlem* and *Carrier Sekani Tribal Council.* Moreover, TGI submits that an archaeological study it commissioned did not identify any archaeological sites within the project area. "All land has been previously disturbed. In fact, as the photographs in Appendix 6 to the Application illustrate, the North exit will be located in the midst of commercial buildings. The directional drill passes many metres below the riverbed, and thus should have no effect on any asserted aboriginal fisheries rights."

TGI submits that it contacted Tsawwassen First Nation, Katzie First Nation and Musqueam First Nation, which are the three First Nations who have archaeological interests in the area (but not in the immediate vicinity of the entry and exit sites for the directional drill), and provided these First Nations with information on the Project. TGI submits that it met with counsel for the Tsawwassen First Nation, and TGI was informed orally that Tsawwassen First Nation had no interest beyond their lands and a full and final settlement had been reached. With respect to the remaining two

First Nations, TGI submits that no response was received but that as observed in Exhibit B-4 BCUC 2.21.1, these First Nations have demonstrated a willingness to engage where they regard potential rights and title to be impacted.

TGI addresses the Commission's second question "If so, what is the scope and content of that duty in this application?" and submits that "If the duty arises, the scope of the duty is necessarily at the very low end of the spectrum identified in *Haida* by virtue of the factors identified in response to the previous question."

So far as the Commission's third question "If the answer to question 1 is yes, has the Crown's duty to consult and, if necessary accommodate, been fulfilled in this application?" is concerned TGI submits that the answer to question 1 is "no". Nevertheless, in light of the limited impacts associated with the Project, the fact that the Project is on private land and the small footprint associated with the Project, the steps outlined in the Application and responses to Information Requests would satisfy the duty to consult if one arose on this Project (Exhibit B-6).

BCOAPO is the only Intervenor to take the opportunity offered by the Commission to address TGI's submissions in respect of First Nations consultation. BCOAPO submits that "on the basis of the evidence presented by TGI, BCOAPO is of the view that the duty to consult does not arise in the circumstances of this application, subject to our correct understanding that there are no issues with respect to Crown land."

BCOAPO agrees with TGI's submission that if the duty to consult arises, it is likely on the low end of the spectrum identified in *Haida.* BCOAPO concludes "as stated above, BCOAPO submits that the test that a private utility should meet with respect to First Nations consultation is one of due diligence in determining that there is not a significant risk of adverse ratepayer impact. We have advised and discussed our position on the due diligence test with TGI. In the present case, this test presents a relatively low hurdle. The record suggests that the impact of the Project on First Nations interests will be minimal. BCOAPO's only reservation is TGI's reliance on silence to indicate consent with respect to the Katzie and Musqueam First Nations. TGI's ongoing communication with the First

Nations may well resolve this issue" (Exhibit C2-4).

TGI in Reply submits that "the fact that the First Nations have not responded to correspondence regarding the Project does not represent an impediment to the Commission granting CPCN approval in the circumstances." (Exhibit B-7)

6.0 COMMISSION DETERMINATION

The Commission Panel is cognizant of the fact that a determination of the need for the Project turns on the potential consequences in the event a mitigation of the identified vulnerabilities is not undertaken and whether a level of risk is prudent to be undertaken in these circumstances. The evidence presented by TGI strongly suggests that in the event of a major pipeline failure, a significant part of the customer base being served would be severely impacted over an extended period of time. Moreover, the studies TGI has contracted for with Golder Associates and BGC to identify the vulnerabilities of both of the existing pipelines is compelling and leaves little room for doubt as to the consequences of a seismic event with a 2475 year return period (the design criterion which the Company has justifiably chosen for the Project). In keeping with this the Commission Panel has concluded that it would not be prudent at this time to assume a level of risk as the consequences of system failure are far too great and that a solution taking both pipelines to a level equal to TGI's design criterion is not only advisable but necessary.

So far as concerns the need for the Project the Commission Panel accepts TGI's assertion that neither pipeline currently satisfies its seismic design guideline, that NPS 20 is vulnerable to erosion, and that both crossings are vulnerable to dike settlement. The Commission Panel also is satisfied that TGI's seismic design guidelines are comparable to those of other utilities and institutions in the region.

The Commission Panel accepts TGI's analysis and comparison of methodologies to address the issue and concurs that HDD is the appropriate methodology.

The Commission Panel accepts that the four alternatives identified by TGI were the most suitable alternatives to be analyzed and compared. The Commission Panel accepts the cost comparison and the non-financial comparison compared by TGI. The Commission Panel notes that TGI did not file an economic analysis as part of its Application. In its 2007 Order G-29-07, the Commission had addressed the methodology to be used by BC Hydro for project evaluation, as follows:

> "The Commission Panel accepts BC Hydro's argument that two tests may be considered for use in project evaluation. The first, and the more important, is an economic analysis of a project, which should only use the incremental cash flows disbursed by BC Hydro as its key input. The second, and less material test is a ratepayer impact analysis which examines how BC Hydro will recover a project's costs from its ratepayers and which may include items typically not found in a conventional economic analysis such as sunk costs, interest during construction and costs allocated from other departments of BC Hydro" (2006 IEP/LTAP Decision pp. 200-01).

For this reason, the Commission Panel directs TGI (and all utilities in the Terasen Group) to include an economic analysis using incremental cash flows in all future CPCN applications.

The Commission Panel notes that Alternative 1 was not the "least-cost" alternative but agrees that it was the most cost-effective alternative considered by TGI.

So far as concerns the Project's estimated cost, the Commission Panel accepts that the cost of the Project will largely be determined by the cost of the steel pipe and the nature and terms of the contract with the HDD contractor.

The Commission Panel has considered the submissions concerning the First Nations and the duty to consult. In *Haida*, the court stated, at paragraph 35:

> "But, when precisely does a duty to consult arise? The foundation of the duty in the Crown's honour and the goal of reconciliation suggest that the duty 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."

In this application, TGI, a non-Crown actor, has provided evidence of its consultation efforts with three First Nation entities. TGI has also provided evidence that an archaeological study did not identify any archaeological sites within the project area. None of the contacted First Nations has provided evidence or submissions which would indicate that there may be an adverse effect on a potential or existing aboriginal right or title. Therefore, the Commission Panel concludes that based on the evidence before it the Crown's duty to consult, and if necessary, accommodate does not arise in the circumstances of this Application.

In summary the Commission Panel finds that TGI has complied with the Commission's Guidelines for companies making CPCN application under Sections 45 and 46 of the UCA, established by Letter L-18-04. Accordingly, the Commission approves a CPCN for the Project that is conditional on TGI having filed by June 15, 2009 a Report (the "Report") providing a description of the contract with the HDD contractor; identification of the components of the Project where cost risk is with the utility and its ratepayers; a description and analysis of risk allocation; a detailed control budget for the Project; an updated Project schedule; and TGI's intentions and recommendations with regard to the completion of the Project; and the cost estimate in the Report in nominal dollars is equal to or less than the cost estimate in the Application plus 20 percent ($32.75 million).

In the event that the cost estimate in nominal dollars in the Report is greater than $32.75 million, TGI may seek Commission approval of the terms of the contract, following a process by which Intervenors may file written submissions on the matter within seven (7) calendar days of the date that the Report is filed with the Commission, and TGI may reply in writing to the submissions within eleven (11) calendar days of the filing of the Report.

So far as concerns the BCOAPO's request for a "pain-share/gain-share" mechanism around a "hard cost collar" the Commission Panel notes TGI's spirited rebuttal and the submission that any such arrangement violates section 60 of the UCA because it might result in prudently incurred costs being ineligible to earn a return on. If such an assertion is correct it casts doubt on a number of conditional CPCNs issued by the Commission and accepted by various utilities. The Commission

Panel will not make a determination on the section 60 argument as there is nothing before it on which to make a finding.

The Commission Panel notes that there is no evidence before it upon which to grant BCOAPO the relief it seeks and it is denied.

DATED at the City of Vancouver, in the Province of British Columbia, this 12th day of March 2009.

Original Signed By:

_____

ANTHONY J. PULLMAN
PANEL CHAIR

Original Signed By:

_____

DENNIS A. COTE
COMMISSIONER

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BRITISH COLUMBIA UTILITIES COMMISSION

ORDER NUMBER C-2-09

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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 Upgrade of the Transmission Pipeline Crossing of the South Arm of the Fraser River

BEFORE: A.J. Pullman, Commissioner and Panel Chair
D.A. Cote, Commissioner

March 12, 2009

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

WHEREAS:

A. On November 6, 2008, Terasen Gas Inc. ("TGI") applied (the "Application") to the British Columbia Utilities Commission (the "Commission"), pursuant to section 45 of the Utilities Commission Act (the "Act"), for a Certificate of Public Convenience and Necessity ("CPCN") for two horizontal directional drilled ("HDD") natural gas transmission pipeline crossings of the South Arm of the Fraser River between Delta and Richmond near Tilbury Island (the "Fraser River South Arm Crossing Upgrade Project", "Project"); and

B. The Fraser River South Arm Crossing Upgrade Project, as proposed by TGI, will be approximately 1,400 metres (0.9 mile) of 508 mm (20 inch) and 610 mm (24 inch) HDD pipelines, and will replace the existing 508 mm (20 inch) and 610 mm (24 inch) buried crossings at this location; and

C. TGI states that it considered several alternatives in the Application, one of which was the replacement of the existing 508 mm (20 inch) crossing with a new HDD 762 mm (30 inch) crossing and pipeline extending from Tilbury Gate Station to Nelson Gate Station; and

D. TGI considers that the Project is non-discretionary as the existing natural gas transmission pipeline crossings are no longer reliable due to potential consequences in the event of a seismic event, the effects of river scouring and future dike improvements; and

. . ./2

E. TGI proposes to start installation of the new crossings in June 2009 and to have the new crossings in-service by October 2009. However, TGI proposes that construction may be undertaken in 2010 if, following evaluation of tenders for the HDD work, it is determined to be more cost effective. TGI estimates the cost of the project will be $27.3 million including Allowance for Funds Used During Construction ("AFUDC"); and

F. By Order G-173-08 dated November 20, 2008, the Commission determined that the Application would be examined by a Written Public Hearing process, and established an amended Regulatory Timetable; and

G. Submissions in the proceeding concluded with TGI's Reply Submission on February 11, 2009; and

H. The Commission Panel has considered the Application and the evidence and submissions in the proceeding and has determined that the Project is in the public interest and that a CPCN be issued to TGI for the Project for the reasons set out in the Reasons for Decision that accompany this Order.

NOW THEREFORE pursuant to sections 45 and 46 of the Act, the Commission orders as follows:

1. A Certificate of Public Convenience and Necessity is granted to TGI for construction and operation of the Fraser River Crossing Upgrade Project as applied for in the Application, subject to the following conditions:

    a. TGI will file with the Commission by June 15, 2009, a Report (the "Report") providing a description of the contract with the HDD contractor; identification of the components of the Project where cost risk is with the utility and its ratepayers; a description and analysis of risk allocation; a detailed control budget for the Project; an updated Project schedule; TGI's intentions and recommendations with regard to the completion of the Project; and cost estimates that have a 50 percent probability ("P50") and a 90 percent probability ("P90") that the actual cost of the Project will not exceed the cost estimates. The control budget will be consistent with the P50 cost estimate and will conform with the format and at a minimum, provide the level of detail set out in BCUC IR 5.2 in Exhibit B-2; and

    b. The P50 cost estimate and control budget in the Report in nominal dollars is equal to or less than the cost estimate in the Application plus 20 percent, which is an amount of $32.75 million; and

    c. In the event that the P50 cost estimate and control budget are greater than $32.75 million, TGI may seek approval of the term of the contract following a process by which Intervenors may file submissions within seven (7) calendar days of the date of the Report is filed with the Commission. TGI may reply in writing to the submissions within eleven (11) calendar days of filing the Report.

2. TGI shall file with the Commission Quarterly Progress Reports on the Project showing planned versus actual schedule, planned versus actual costs, and any variances or difficulties that the Project may be encountering. The Quarterly Progress Reports will be filed within 30 days of the end of each reporting period, and will generally be as set out in Appendix A to this Order.

3. TGI shall file with the Commission a Final Report, within six months of the end or substantial completion of the Project, that provides a complete breakdown of the final costs of the Project, compares these costs to the updated cost estimate, and provides an explanation and justification of material cost variances.

4. TGI shall comply with directions of the Commission Panel in the Reasons for Decision that accompanies this Order.

DATED at the City of Vancouver, in the Province of British Columbia, this 12th day of March 2009.

BY ORDER

Original Signed By:

A.J. Pullman
Commissioner and Panel Chair

Attachments

An Application by Terasen Gas Inc.
for a Certificate of Public Convenience and Necessity
for the Upgrade of the Transmission Pipeline Crossing of the South Arm of the Fraser River

Table of Contents of Quarterly Progress Report

4. Project Costs

4.1.1 Project Cost Summary including explanation of variances relative to the cost estimate in the Application and the updated control budget. For each cost category the report should show: "amount in CPCN Application", amount in control budget", "spent to date", "estimate to complete", "forecast total to complete", and "variances". At a minimum, information will be provided for each cost category identified in BCUC IR 5.2 in Exhibit B-2.

4.1.2 Financial Summary including explanation of variances for the total project costs.

4.1.3 Summary of Individual Contracts (Construction and Procurement) Exceeding $2 million with Budget Amount, Award Amount, Approved Change Orders.

5. Project Resource Management

5.1.1 Engineering Resources (Man-hours, Planned vs. Actual – non- cumulative) both in chart and table format. Provide explanation for variance and corrective action taken.

5.1.2 Construction Resources (Man-hours, Planned vs. Actual – non-cumulative) both in chart and table format. Provide explanation for variance and corrective action taken.

6. Project Risks

6.1.1 Current Project Risks.

6.1.2 Risks Going Forward.

7. Stakeholder or First Nation Issues

7.1.1 An ongoing report on the status of all existing and new issues, and an explanation of any new issues.

LIST OF TABLES

IN THE MATTER OF
the Utilities Commission Act, R.S.B.C. 1996, Chapter 473

and

Terasen Gas Inc.
Fraser River South Arm Crossing Upgrade Application
for a Certificate of Public Convenience and Necessity ("CPCN")

EXHIBIT LIST

Exhibit No.	Description
COMMISSION DOCUMENTS	
A-1	Letter dated November 21, 2008 appointing the Commission Panel for the review of the Application for a Certificate of Public Convenience and Necessity for the Fraser River South Arm Crossing Upgrade Project
A-2	Letter dated November 21, 2008 and Order G-173-08 establishing a Written Public Hearing and Regulatory Timetable for review of the Application
A-3	Letter dated December 4, 2008 issuing Information Request No. 1 to Terasen
A-4	Letter dated January 19, 2009 issuing Commission Information Request No. 2a
A-5	**CONFIDENTIAL** - Letter dated January 19, 2009 issuing Commission Information Request No. 2b
A-6	Letter dated February 26, 2009 requesting submissions from Terasen Gas and Intervenors on whether the Crown's duty to consult (as directed in the Court of Appeal ruling) has been met with respect to the CPCN Application
APPLICANT DOCUMENTS	
B-1	Letter dated November 6, 2008, filing the Application for a Certificate of Public Convenience and Necessity for the Fraser River South Arm Crossing Upgrade Project
B-2	Letter dated December 19, 2008 filing response to Commission Information Request No. 1

Exhibit No.	Description
B-2-1	**CONFIDENTIAL** - Letter dated December 19, 2008 filing response to Commission Information Request No. 1, Question 5.5
B-2-2	Letter dated December 24, 2008 filing a correction to Commission IR 1.18.1
B-3	Letter dated December 19, 2008 filing response to BCOAPO Information Request No. 1
B-3-1	Letter dated December 24, 2008 filing a correction to Commission IR 1.2.3
B-4	Letter dated January 26, 2009 filing response to Commission Information Request No. 2(a)
B-4-1	**CONFIDENTIAL** - Letter dated January 26, 2009 filing response to Commission Information Request No. 2(b)
B-5	Letter dated January 26, 2009 filing response to BCOAPO Information Request No. 2
B-6	Letter dated March 4, 2009 response to Exhibit A-6 Duty to Consult
B-7	Letter dated March 11, 2009 Reply of TGI to the submissions of BCOAPO

INTERVENOR DOCUMENTS

C1-1	**METRO VANCOUVER –** Email dated November 27, 2008 from Thomas Wu filing request for Registered Intervenor status
C2-1	**THE BRITISH COLUMBIA PUBLIC INTEREST ADVOCACY CENTRE –** Email dated December 10, 2008 from Leigha Worth filing request for Registered Intervenor status on behalf of the British Columbia Old Age Pensioners' Organization, Active Support Against Poverty, federated anti-poverty groups of BC and Tenant Resource & Advisory Centre ("BCOAPO")
C2-2	Letter dated December 12, 2008 filing Information Request No. 1 to Terasen Gas Inc.
C2-3	Letter dated January 20, 2009 filing Information Request No. 2 to Terasen Gas Inc.
C2-4	Letter dated March 09, 2009 BCOAPO Submissions on First Nations consultation

Exhibit No.	**Description**
C3-1	**CITY OF RICHMOND –** Email dated December 11, 2008 from Jim V. Young, P.Eng. filing request for Registered Intervenor status
C3-2	Letter dated December 18, 2008 issuing support for the Terasen Gas Inc. Application

INTERESTED PARTY DOCUMENTS

D-1	**OIL & GAS COMMISSION (SOUTHERN REGION)** – Email dated December 1, 2008 from Chris A. Wagner, Operations Inspector, requested Interested Party Status
D-2	**CORPORATION OF DELTA –** Email dated December 4, 2008 from Hugh Fraser filing request for Interested Party status