



Tom A. Loski
Chief Regulatory Officer

16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (604) 592-7464
Cell: (604) 250-2722
Fax: (604) 576-7074
Email: tom.loski@terasengas.com
www.terasengas.com

Regulatory Affairs Correspondence
Email: regulatory.affairs@terasengas.com

January 26, 2009

British Columbia Public Interest Advocacy Centre
Suite 209 – 1090 West Pender Street
Vancouver, BC
V6E 2N7

Attention: Mr. James L. Quail, Executive Director

Dear Mr. Quail:

**Re: Terasen Gas Inc. ("Terasen Gas")
Application for a Certificate of Public Convenience and Necessity ("CPCN") for
the Fraser River South Arm Crossing Upgrade (the "Application")
Response to the British Columbia Public Interest Advocacy Centre on behalf of
the British Columbia Old Age Pensioners Organization et al ("BCOAPO")
Information Request ("IR") No. 2**

On November 6, 2008, Terasen Gas filed the Application as referenced above. In accordance with Commission Order No. G-173-08 setting out the Regulatory Timetable for the Application, Terasen Gas respectfully submits the attached response to BCOAPO IR No. 2.

If there are any questions regarding the attached, please contact the undersigned.

Yours very truly,

TERASEN GAS INC.

Original signed by: Shawn Hill

For: Tom A. Loski

Attachment

cc (e-mail only): Registered Participants



Terasen Gas Inc. ("TGI", "Terasen Gas" or the "Company") Application for a Certificate of Public Convenience and Necessity ("CPCN") for the Fraser River South Arm Crossing Upgrade (the "Application" or "Project")	Submission Date: January 26, 2009
Response to British Columbia Public Interest Advocacy Centre on behalf of the British Columbia Old Age Pensioners Organization <i>et al</i> ("BCOAPO") Information Request ("IR") No. 2	Page 1

**8.0 Reference: Exhibit B-1, p. 16
Exhibit B-3 BCOAPO IR 1.2.3, and
Exhibit B-2 BCUC IR 1.5.4**

8.1 Please provide the estimates, calculations, and assumptions underpinning TGI's claim that constructing both HDD crossings at once will achieve at least \$6M in efficiencies.

Response:

The table which follows summarizes the estimates, calculations and assumptions used by TGI to determine the estimated efficiencies of \$6 million for constructing both HDD crossings at once.



Terasen Gas Inc. ("TGI", "Terasen Gas" or the "Company") Application for a Certificate of Public Convenience and Necessity ("CPCN") for the Fraser River South Arm Crossing Upgrade (the "Application" or "Project")	Submission Date: January 26, 2009
Response to British Columbia Public Interest Advocacy Centre on behalf of the British Columbia Old Age Pensioners Organization <i>et al</i> ("BCOAPO") Information Request ("IR") No. 2	Page 2

Alternative Comparison of Capital Cost Estimates to Estimate Dual HDD Efficiencies

		(A1) Alternative 1	(A2) Post Seismic Alternative 2	(A3) Alternative 3	(A3 + A2) – A1	Assumptions
Description		NPS 20 & 24 HDD	NPS 24 HDD Following major seismic event	NPS 20 HDD	Capital Savings	Justifications for claim in reduction or increase in capital cost. Increasing scope of work (two pipelines build concurrently versus single pipelines construct by different resources at different period of time at the same work site) is more cost efficient.
		Estimate (\$2008 millions)	Estimate (\$2008 millions)	Estimate (\$2008 millions)	Estimate (\$2008 millions)	Based on constant \$2008 dollars
1	Project Services	\$ 4.9	\$3.1	\$4.0	\$ 2.2	A single larger project reduces duplication of project services including Project Management and Administration, TGI Engineering, Engineering Consultants, Surveys, Health and Safety , Legal, Community Relations
2	Land, Temporary Workspace	\$ 1.8	\$1.3	\$1.1	\$ 0.6	Single larger project will require a larger footprint but it is only a single event for such items as land rentals, crop losses, accommodation costs, land agent fees.
3	Pipe & Coating Materials	\$ 3.6	\$2.0	\$1.4	-\$ 0.2	Pipes are sourced at different mills, premium to manufacture pipe for coincident delivery dates, additional incremental costs for shipping, inventory control, for stockpiling, and additional bypass piping.
4	River Crossing HDD Installation	\$ 11.6	\$7.9	\$6.6	\$ 2.9	Reduced contractor mobilization costs, longer duration single job should provide incentive for unit rate reductions, single site preparation on North and South sides, reduced HDD tracking costs, mud & cuttings disposal coordination
5	Pipeline Tie In Construction	\$ 2.5	\$1.5	\$1.0	\$ 0.0	Reduced costs for dewatering, single mobilization, single restoration quantity, force account estimate is quantity based, no quantity discount in effect,
6	Pipeline Commissioning	\$ 0.6	\$0.4	\$0.4	\$ 0.2	Single mobilization offsets increase in cost for two different diameters for baseline runs
7	North Bank Dike Improvements Allowance	N/A	N/A	N/A	N/A	Constant for all projects, not affected by order or sequence of construction
9	Retirement Costs	\$ 0.4	\$ 0.3	\$ 0.3	\$ 0.2	Reduction in mobilization & services costs for single pipe retirement process
10	AFUDC	\$ 0.9	\$ 0.6	\$ 0.6	\$ 0.3	Reduced total construction period and total costs should reduce AFUDC incurred
11	Total Project –	\$26.30	\$17.10	\$15.40	\$ 6.2	Note : exc dike improvement allowance



Terasen Gas Inc. ("TGI", "Terasen Gas" or the "Company") Application for a Certificate of Public Convenience and Necessity ("CPCN") for the Fraser River South Arm Crossing Upgrade (the "Application" or "Project")	Submission Date: January 26, 2009
Response to British Columbia Public Interest Advocacy Centre on behalf of the British Columbia Old Age Pensioners Organization <i>et al</i> ("BCOAPO") Information Request ("IR") No. 2	Page 3

- 8.2 The response to BCOAPO 1.5.4 states that "TGI expects the range of accuracy of this estimate to be -15% +20% as the individual estimates were prepared to that range of accuracy." This statement appears to assume that the individual cost estimates are completely uncorrelated or independent – an assumption that appears to be questionable, given that the two estimates involve some sharing of inputs, some correlation due to trends in material prices, and a common location. If the estimates are assumed to be uncorrelated, please explain why that is a valid assumption. If the estimates are assumed to be correlated, please explain how the range of the sum of the two estimates equals the range of the individual estimates.

Response:

The estimates are assumed to be correlated since they were prepared at the same time, with similar inputs and the same level of accuracy. The uncertainty range for the sum of two correlated estimates is the same as the individual estimates. TGI interprets correlation to mean that changes to cost components within each estimate would move proportionally. If the estimates were uncorrelated, then the uncertainty range would not necessarily be the same as the ranges for the individual estimates.



Terasen Gas Inc. ("TGI", "Terasen Gas" or the "Company") Application for a Certificate of Public Convenience and Necessity ("CPCN") for the Fraser River South Arm Crossing Upgrade (the "Application" or "Project")	Submission Date: January 26, 2009
Response to British Columbia Public Interest Advocacy Centre on behalf of the British Columbia Old Age Pensioners Organization <i>et al</i> ("BCOAPO") Information Request ("IR") No. 2	Page 4

9.0 Reference: Exhibit B-1, p. 20, Table 5.1, and Exhibit B-3 BCOAPO IR 1.3.1

Preamble: BCOAPO IR 1.3.1 asked how the -15% +20% "range of accuracy" should be interpreted. In response, TGI stated, "[T]he -15% +20% cost accuracy for each alternative in Table 5.1 is the overall range for the total project cost."

9.1 Please specify the degree of confidence that TGI has that the total project costs will be within the range of accuracy and the statistical underpinnings for that confidence level.

Response:

Please see the response to BCUC IR 2.12.7.

9.2 Please indicate how long TGI has been using a "range of accuracy" methodology similar to the one employed in this Application to estimate project costs.

Response:

TGI has used "range of accuracy" or deterministic cost estimates, as used in this application, for many years. Although this method has been the historical estimating reference, the probabilistic method (including Range Estimating), or a combination of both methods have also been used at TGI.

The decision of which estimating method to use for a particular project is made considering many factors which include:

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

Many projects now utilize different estimating methods at different stages of the project lifecycle. For example, a project may begin with a deterministic estimate, evolve to a probabilistic method to capture risk costs and uncertainties, and then turn back into deterministic for day to day cost control and project execution.



Terasen Gas Inc. ("TGI", "Terasen Gas" or the "Company") Application for a Certificate of Public Convenience and Necessity ("CPCN") for the Fraser River South Arm Crossing Upgrade (the "Application" or "Project")	Submission Date: January 26, 2009
Response to British Columbia Public Interest Advocacy Centre on behalf of the British Columbia Old Age Pensioners Organization <i>et al</i> ("BCOAPO") Information Request ("IR") No. 2	Page 5

9.3 Please provide any evidence available that TGI's "range of accuracy" for project estimation has been a reliable and accurate predictor of actual project costs in the past.

Response:

TGI has summarized below a number of its transmission system CPCNs and recent major HDD projects in the table below including the accuracy ranges. With the exception of the Fraser River Port Mann HDD, the projects have been within or below the cost estimate range. The costs of the Port Mann HDD project exceeded the estimated cost due primarily 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.

As is evident from the experience with the Port Mann HDD project, comparing range of accuracy cost estimates to actual results from previous projects says nothing about whether a discrepancy on a particular project was the result of imprudence on the part of the Company or other factors that are entirely outside of the Company's control. 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.

TGI believes that the estimate range is a useful tool that yields reliable results for the purpose of ranking alternatives on this non-discretionary project. TGI will provide the Commission with a control budget after the receipt of material and construction tenders, which TGI proposes be used as a basis for subsequently assessing the progress of the project.

Order No.	Description	Estimate (\$ million)	Estimate Range (%)	Actual Costs (\$ million)	Variance Actual/Estimate (%)
C-1-99	Fraser River HDD Crossing near Port Mann	\$6.5 million	+/-10%	\$10.1 million	+42%
C-11-99	Southern Crossing Project	\$376 million	+/-10%	\$397.7 million	+6%
C-14-99	Fraser Valley Compressor Station near Langley	\$31.7 million	+/-10%	\$28.1 million	-11%
2005 Internal Project	Fraser River HDD Crossing Bedford Channel near Fort Langley	\$1.1 million	+/-10%	\$1.07 million	-3%
2008 Internal Project	Columbia River HDD Crossing Brilliant near Castlegar	\$2.7 million	+/-15%	\$2.4 million in 2008; \$0.36 million in 2009	0%



Terasen Gas Inc. ("TGI", "Terasen Gas" or the "Company") Application for a Certificate of Public Convenience and Necessity ("CPCN") for the Fraser River South Arm Crossing Upgrade (the "Application" or "Project")	Submission Date: January 26, 2009
Response to British Columbia Public Interest Advocacy Centre on behalf of the British Columbia Old Age Pensioners Organization <i>et al</i> ("BCOAPO") Information Request ("IR") No. 2	Page 6

10.0 Reference: Exhibit B-1, p. 7 and p. 18, Appendix 13, and Exhibit B-3 BCOAPO IR 1.7.1

10.1 Please confirm that Alternative 4 would require 2.8 km of NPS 30 as stated at page 18 of Exhibit B-1.

Response:

Alternative 4 would require approximately 2.8km of NPS 30 pipe. This includes approximately 700m on the North side of the river, 600m on the South side and approximately 1500m for the drill path.

10.2 Please confirm that Alternative 1 would require approximately 1400m of NPS 20 and 1400m of NPS 24 as stated at page 7 of Exhibit B-1.

Response:

Since the submission of Exhibit B-1, further engineering has been done. Although not yet finalized, the current bore path design for the NPS 20 and 24 HDD's show the total length for the replacement piping as the following. This minor design change does not affect TGI's overall cost estimate in the Application of \$27.3 million (+20 / -15%).

Pipe Size	Approximate Length of HDD	Approximate Length for Tie-in	Total
NPS 20	1270m	200m	1470m
NPS 24	1270m	200m	1470m

10.3 Please provide the estimated freight, handling, and stockpiling costs for Alternative 1 and also for Alternative 4.

Response:

The estimated freight, handling, and stockpiling costs for Alternative 1 are \$475,000.

The estimated freight, handling, and stockpiling costs for Alternative 4 are \$520,000.



Terasen Gas Inc. ("TGI", "Terasen Gas" or the "Company") Application for a Certificate of Public Convenience and Necessity ("CPCN") for the Fraser River South Arm Crossing Upgrade (the "Application" or "Project")	Submission Date: January 26, 2009
Response to British Columbia Public Interest Advocacy Centre on behalf of the British Columbia Old Age Pensioners Organization <i>et al</i> ("BCOAPO") Information Request ("IR") No. 2	Page 7

- 10.4 BCOAPO IR 1.7.1 specifically asked for clarification with respect to the difference between Alternative 1's and Alternative 2's "Pipe & Coating Materials" as estimated in the Appendix 13 line item. Please confirm that all of the factors mentioned in TGI's response (e.g., cross over valves, actuators, fittings, NPS pigging facilities, induction bands, etc.) are reflected in the total costs reported for "Pipe & Coating Materials" in Appendix 13. If unable to so confirm, please provide a mapping of each of the factors mentioned by TGI in the response to BCOAPO IR 1.7.1 into the line items shown in Appendix 13.

Response:

TGI confirms that all of the factors mentioned in the response to BCOAPO IR 1.7.1 are reflected in the total costs reported for "Pipe & Coating Materials" in Appendix 13.