



Adam Stiers
Manager, Regulatory Applications
Leave to Construct
Regulatory Affairs

tel 519-436-4558
EGIRegulatoryProceedings@enbridge.com
astiers@enbridge.com

Enbridge Gas Inc.
50 Keil Drive
Chatham, Ontario N7M 5M1
Canada

September 16, 2022

VIA EMAIL and RESS

Nancy Marconi
Registrar
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Dear Nancy Marconi:

**Re: Enbridge Gas Inc. (Enbridge Gas)
Ontario Energy Board (OEB) File: EB-2022-0086
Dawn to Corunna Replacement Project
Interrogatory Response Updates**

Further to the interrogatory responses filed on June 30, 2022, in the above noted proceeding, and at the request of Environmental Defence (“ED”) on September 14, 2022, Enbridge Gas is filing an update to the following interrogatory responses:

Exhibit	Update
Exhibit I.STAFF.8	Page 2 – To correct 680 TJ/d to 666 TJ/d. Page 3 – To correct 680 TJ/d to 666 TJ/d.
Exhibit I.SEC.13	Page 4 – To correct the “Capacity” values in all rows of Table 1 from 680 TJ/d to 666 TJ/d.

These updates are consistent with the previous explanations provided by Enbridge Gas in response to questions from ED: (i) in interrogatories Exhibit I.ED.5, Exhibit I.ED.6, and Exhibit I.ED.13; (ii) during the Technical Conference;¹ (iii) in Technical Conference undertakings;² and (iv) via email on August 31, 2022.

As stated in Enbridge Gas’s email response to ED on August 31:

JT1.8 was intended to correct the record to state that 0.67 PJ/d would be lost by retirement of the existing 7 CCS units and an equivalent amount of capacity (without any additional capacity being created) would result from installation of the proposed NPS 36 pipeline and associated ancillary facilities. EGI mistakenly referred to 0.68 PJ/d. Although 0.68 PJ/d was referenced, all analysis and assessments of alternatives etc. were completed using the 0.67 PJ/d. There is no technical basis for 0.68 PJ/d. It is merely a typographical error.³

¹ Technical Conference Day 1 Transcript p. 126, Lines 22-25

² Exhibit JT1.8

³ Enbridge Gas Email to All Parties, August 31, 2022

September 16, 2022

Page 2

Please contact the undersigned if you have any questions.

Yours truly,

(Original Digitally Signed)

Adam Stiers

Manager, Regulatory Applications - Leave to Construct

cc.: C. Keizer (Torys)
R. Murray (OEB Staff)
EB-2022-0086 (Intervenors)

ENBRIDGE GAS INC.

Answer to Interrogatory from
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, Page 1
Exhibit C, Tab 1, Schedule 1, Attachment 2, Page 6 (ICF Report)

Preamble:

Enbridge Gas states that the Project would provide an equivalent amount of storage withdrawal/deliverability capacity as the existing Corunna Compressor Station compressor units proposed to be retired/abandoned, which is approximately 680 TJ/d. Enbridge Gas states that the current withdrawal/deliverability capacity as the existing Corunna Compressor Station compressor units is:

- Withdrawal capacity of 1.89 PJ/d
- Injection capacity of 0.84 PJ/d

The ICF report says that decommissioning of the compressors at Corunna Compressor Station would reduce Enbridge Gas's access to storage working gas space from about 99.4 PJ to 84.7 PJ and would reduce the withdrawal capacity at full working gas inventory from 1.89 PJ/day to 1.23 PJ/day.

Question:

- a) Please explain how the Project's capacity of 680 TJ/d is equivalent to the current capacity of between 0.84 and 1.89 PJ/d?
- b) Please reconcile Enbridge Gas's capacity numbers with those of ICF's

Response

a) & b)

Please see Table 1 below a comparison of capacity numbers presented in the ICF report Page 1 and Enbridge Gas’s pre-filed evidence at Exhibit C, Tab 1, Schedule 1.

Table 1

Row		ICF	Exhibit C Tab 1 Schedule 1
1	Current withdrawal Capacity	1,894 TJ/d	1,894 TJ/d
2	Withdrawal Capacity with Compressor Abandonment	1,228 TJ/d	1,228 TJ/d
3	Reduced Withdrawal Capacity (1 - 2)	666 TJ/d	666 TJ/d
4	Working Capacity	99.4 PJ	99.4 PJ
5	Reduced Injection Capacity ⁽¹⁾	14.7 PJ	14.7 PJ
6	Available Working Gas (4 – 5)	84.7 PJ	84.7 PJ
7	Reduced Withdrawal Capacity ⁽¹⁾	5.7 PJ	5.7 PJ
8	Final Available Space (6-7)	79.1 PJ	79.1 PJ

(1) In total there is 20 PJ of space not accessible due to the decreased injection and withdrawal capability. This is split between the inability to fill 14.7 PJ on injection and the inability to empty an additional 5.7 PJ on withdrawal. Since Enbridge Gas plans to hold more than 5.7 PJ of inventory at the end of the withdrawal season there are currently financial consequences of losing the 5.7 PJ of space on the withdrawal side when analyzing supply side alternatives.

ICF and Enbridge Gas used the same storage withdrawal, injection, and working gas capacity values for their analysis.

The current maximum withdrawal deliverability with the compressors is 1,894 TJ/d (1.89 PJ/d) and the current maximum injection capacity is 840 TJ/d (0.84 PJ/d) with the compressors. 666 TJ/d is the withdrawal deliverability that will be lost if the compressors are retired and not replaced. 99.4 PJ is the current regulated working gas capacity of the facility; this is not a deliverability or flow rate but rather the amount of gas the facility can hold that can be used to serve in-franchise customers of Enbridge Gas’s regulated business. These values are shown in Figures 1 and 2 on pages 4 and 5 of Exhibit C in the project application (EB-2022-0086, Exhibit C, Tab 1, Schedule 1, pp. 4-5).

/U

The ICF report states that “decommissioning of the compressors at Corunna would reduce Enbridge’s access to storage working gas space at Tecumseh from 99,400 TJ to 84,673 TJ and would reduce the withdrawal capacity at Tecumseh at full working gas inventory from 1,894 TJ/day to 1,228 TJ/day.” The reduction in withdrawal capacity from 1,894 TJ/d (1.89 PJ/d) to 1,228 TJ/d (1.23 PJ/d) is equal to the 666 TJ/d reduction in withdrawal capacity cited in Enbridge’s application. ICF used the exact difference (666 TJ/d) shown in Figure 1 on page 4 of Exhibit C in the project application. 84.7 PJ (84,673 TJ) is the amount of storage working gas space that will remain if the compressors are retired without a replacement. This is calculated by using the reduced injection capacity shown in Figure 2 on page 5 of Exhibit C in the project application. If the compressors are retired and no additional injection capacity is added, the maximum working gas capacity will be 84.7 PJ because that will be the highest storage level that the storage will be able to be reliably refilled to after the withdrawal season. This is shown in Exhibit 2-1 of ICF’s report (EB-2022-0086, Exhibit C, Tab 1, Schedule 1, Attachment 2, p. 15).

/U

ENBRIDGE GAS INC.

Answer to Interrogatory from
School Energy Coalition (“SEC”)

INTERROGATORY

Reference:

[C-1-1]

Question:

EGI assessed alternatives based on a scenario where it retires and abandons all 7 CCS compressor units, without the construction of a new NPS 36 pipeline and related work. Please explain why EGI did not model or consider any alternatives that would involve retirement of only some of the 7 compressor units.

Response

Enbridge Gas did consider an alternative that retires less than 7 compressors. As outlined in Exhibit C, the Repair + Replace Alternative considers retiring only 3 compressor units (K701 – K703) and constructing an NPS 20 pipeline from CCS to Dawn to replace the equivalent capacity at a capital cost of \$160 million and an NPV of (\$208 million).¹ However, this alternative does not address the shortfall risk of having to procure gas supply for multiple unit outages as a result of continued downtime for maintenance, repairs and unplanned events. Further, it does not address the imminent need to resolve the obsolescence, declining reliability and increasing safety risks to Company personnel underlying the proposed Project Application.² As it is uneconomic and does not resolve the underlying system constraints driving the need for the Project this alternative has been deemed to be infeasible.

The Company has analyzed other alternatives that could be combined with the Repair + Replace Alternative and found that they were uneconomic and similarly infeasible.

¹ Exhibit C, Tab 1, Schedule 1, Paras 42-45. This alternative is less economic than the proposed Project due to the incremental O&M costs required to maintain CCS units K705-K708.

² Exhibit B, Tab 1, Schedule 1, p. 29: Short-term mitigations do not represent a solution to the obsolescence, reliability and safety risks presented at CCS and ultimately do not address the Project need.

Additional Phased-In Repair + Replace Alternatives

All additional alternatives assessed are significantly more expensive than the Project. This is because significant cost savings are realized through economies of scale by replacing all 7 compressor units at one time with an NPS 36 pipeline. In addition to the cost of the Repair + Replace Alternative (NPS 20 pipeline replacing K701-703 at a capital cost of \$160 million) and assuming that K705-708 were replaced or “phased-in” at some point in the near future after the Repair + Replace Alternative is constructed, this alternative would require either:

- **A Taurus 70 compressor:** This would be built at CCS at a new location on the east side³ of Tecumseh Road with an estimated capital cost of \$161 million in 2023 dollars, totaling \$321 million when combined with the Repair + Replace alternative cost.
- **A Spartan e90 compressor:** This would be built at CCS at a new location on the east side³ of Tecumseh Road with an estimated capital cost of \$169 million in 2023 dollars, totaling \$329 million when combined with the Repair + Replace alternative cost.
- **An additional NPS 30 pipeline:** This pipeline would run from the CCS to Dawn with capital cost estimated at approximately \$140 million in 2023 dollars, totaling \$300 million with the Repair + Replace alternative cost.

Any new Taurus 70 or Spartan e90 compressor built would be installed on the east side of Tecumseh Road on greenfield property owned by the Company as there is not sufficient room within the existing CCS yard for new compression. Installing a single 10,000 – 12,000 HP compressor (Taurus 70, Spartan e90 EMD paired with Solar C45 compressor) as part of a phased-in approach would leave the Company with a single point of failure without LCU in the event the single unit goes down putting EGD rate zone customers at increased risk of experiencing a shortfall in the future (especially under design day conditions).⁴

Update to Electric Motor Drive Compression Alternative Analysis

For the Company to further consider the Electric Drive Motor Compression Alternative, it would need to assess the reliability of the electric grid infrastructure and costs to install

³ Enbridge Gas incorrectly noted this as the west side of the existing station within Exhibit C.

⁴ The Company considered this for each of the Natural Gas Fired Compression and Electric Drive Motor Compression alternatives which include 2 units on the east side of the road. Both units are required to be utilized on design day and are backed up by K711, which does not provide full redundancy should 1 of the 2 units not be available.

backup power generation in the event hydro service is interrupted. Existing backup power at CCS today is only sized to provide power supply to controls and supply motor loads for cooling fans, pumps. Backup power for a 10 MW EMD alternative would come at an incremental cost that is not included in the current estimate, making it even more uneconomic. In addition, building the NPS 36 pipeline and utilizing Dawn horsepower provides a backup power benefit compared to the CCS compression alternatives as the Dawn Operations Centre has a Power Generation system that provides site-wide backup power capabilities to maintain the operation in the event of loss of utility power. The Power Generation system has the capability to operate in parallel with the utility grid, disconnected from the grid (self-generated power) and includes an automated microgrid black starting capability that significantly enhances power system reliability for critical infrastructure.

The Company assumed a hydro rate of \$0.148/kWh in O&M costs for the Electric Motor Drive Compression alternative based existing rates at the Parkway Compressor Station.⁵ Upon further review, in the assessment of the Electric Motor Drive Compression alternative, the Company has not accounted for all global adjustment and delivery charges and should be using a hydro rate of \$0.18/kWh. This adjustment in hydro rate increases the NPV of the EMD alternative from (\$270 million) to (\$289 million).

Summary

After this additional analysis, the proposed Project remains the most cost-effective and reliable alternative to address the Project need and serve the firm demands of Enbridge Gas's customers.

In summary, to phase-in the retirement of the 7 CCS compressor units would cost between \$300 - \$333 million (see Table 1) compared to the Project at \$206 million and would expose ratepayers to increase risk of shortfall. A gradual phase in and rebuild of compression is not cost-effective and does not address the imminent need to address the obsolescence, reliability and safety issues at CCS. Further, as displayed in table 4.6 of the RAM which indicates an increasing frequency of failures for these units, Enbridge Gas anticipates that the pace of failure and replacement under such a strategy could be rapid and would be somewhat out of the Company's, ratepayers and the OEB's control.

⁵ Exhibit C, Tab 1, Schedule 1, Table 2 and Exhibit C, Tab 1 Schedule 1, p. 19

Table 1

/U

Alternative	Capacity (TJ/d)	Capital Cost (\$Million)	O&M Cost (\$Million)	Unitized Cost (\$Million/TJ/d)	NPV (\$Million)
Non-Facility Alternatives					
Commercial Alternative + ETEE + Reduced Facilities	666	191 ⁽¹⁾	3,936 – 3,967	6.19 – 6.24	N/A
Facility Alternatives					
Natural Gas Fired Compression	666	211	3.88/yr	0.32	(212)
Electric Motor Drive Compression	666	217	6.84/yr	0.33	(270)
EMD Compression with Update O&M	666	217	8.07/yr	0.33	(289)
NPS 36 Pipeline	666	206	2.99/yr	0.31	(200)
LNG Storage	666	541	2.62/yr	0.81	N/A
Repair Alternative					
Repair + Replace*	666	160	5.33/yr	0.24	(208)
Phased-in Facility Alternatives					
Repair + Replace + Taurus 70	666	321			N/A
Repair + Replace + Spartan e90 EMD	666	329			N/A
Repair + Replace + NPS 30	666	300			N/A

NOTES:

⁽¹⁾ In Exhibit C, Tab 1, Schedule 1, p. 1, Table 2 the Commercial + ETEE + Reduced Facilities alternative was mistakenly listed at \$235MM which is the loaded cost of the alternative. All other capital costs are provided as unloaded costs. This alternative remains \$15 million less than the NPS 36 Pipeline (the Project) and is updated to reflect an unloaded cost of \$191 million.