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May 31, 2016

**VIA RESS, COURIER AND EMAIL**

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street
Suite 2700
Toronto, ON
M4P 1E4

**Re: Enbridge Gas Distribution Inc. ("Enbridge")**
**EB-2015-0037 – Innes Road Pipeline Project (formerly EB-2012-0438 and EB-2014-0017) Conditions of Approval – Financial Report**

In accordance with the Conditions of Approval and the Ontario Energy Board's Vary Order as issued on February 13, 2015 for the above noted project, attached please find two copies of Enbridge's financial report.

If you have any questions, please contact the undersigned.

Yours truly,

[original signed]

Shari Lynn Spratt
Supervisor, Regulatory Proceedings

Attachment

cc: Zora Crnojacki, OPCC Chair (via email)
Pascale Duguay, Manager, Natural Gas Applications, Ontario Energy Board (via courier and email)

Innes Road Pipeline Replacement Project

EB-2012-0438
EB-2014-0017
EB-2015-0037

# Post-Construction Financial Report

May 31, 2016

## Introduction

Enbridge Gas Distribution Inc. ("Enbridge") filed an application with the Ontario Energy Board (the "Board") on December 11, 2012, under section 90 of the *Ontario Energy Board Act, 1998*, S.O. 1998, c. 15, Schedule B for an order granting Leave to Construct approximately 2.8 kilometers of Nominal Pipe Size 12 ("NPS 12") Extra High Pressure steel pipeline and ancillary facilities to comply with Enbridge's Integrity Management Program along Innes Road in the City of Ottawa.

The Board assigned the file number EB-2012-0438 to the application and granted Leave to Construct on April 11, 2013. On January 23, 2014, the Board, under the file number EB-2014-0017, granted an extension to the construction commencement date to May 31, 2014. On February 13, 2015, the Board, under file number EB-2015-0037, varied the Conditions of Approval to allow the Post Construction Financial Report to be filed before May 31, 2016.

Pipeline construction activities for the Innes Road Pipeline Replacement project commenced in April 2014 and were completed in September 2014. Most of the restoration activities were completed in November 2014. Additional restoration activities were completed in 2015 and the spring of 2016.

This Post-Construction Financial Report summarizes the actual capital costs of the project and provides an explanation of significant variances from the original estimates.

## Cost and Variance Reporting

The actual project cost of $10.6 million is $3.37 million greater than the original estimate of $7.25 million reported in EB-2012-0438, Exhibit C, Tab 2, Schedule 1.

A comparison of actual versus estimated project costs is shown in Table 1 below.

Table 1 – Total Project Costs

Innes Road Pipeline Replacement Project

| Item No. | Breakdown | Budgeted Cost | Actual Cost | Variance |
|---|---|---|---|---|
| 1.0 | Material Costs | $ 898,677 | $ 1,279,529 | $380,852 |
| 2.0 | Labour Costs | $ 5,125,988 | $ 7,523,475 | $2,397,487 |
| 3.0 | External & Regulatory Costs | $ 199,032 | $ 914,779 | $715,747 |
| 4.0 | Land Costs | $ 75,000 | $ 252,310 | $177,310 |
| 4.0 | Overhead Costs | $ 318,530 | $ 650,299 | $331,769 |
| 5.0 | Contingency Costs | $ 637,059 | $ - | ($637,059) |
| 6.0 | Total Project Cost | $ 7,254,286[1] | $ 10,627,392[2] | $3,366,105 |

[1] The Budgeted Costs for Items 1-5 are per the application. The Total Budgeted Project Cost of $7,243,501 shown in the application bears a typographical error. It should total to $7,254,286 as shown above. Variance between both Budgeted amounts and the Actual costs is approximately 44%.

[2] This includes approximately $7,000 for restoration to be incurred in 2016.

The primary factor which contributed to the actual costs exceeding the original filed budget was the project scope definition level at the time of filing the application and the corresponding cost contingency.

At the time of the application, the scope definition of the Innes Road Pipeline Replacement project was comparable to a Class 5/Class 4 as defined by the Association for the Advancement of Cost Engineering ("AACE"), with a preliminary project definition and schedule, preferred route selection and a preliminary cost estimate. However the cost contingency was set at 15% at the time of the application, which was significantly underestimated given the scope definition of the project.

Further definition of the project scope identified the need for additional external engineering and land costs, and constructability challenges associated with the work.

Timing of project execution was another factor affecting the costs directly associated with the construction phase, with increased contractor labour rates and material costs between the filing of the application to actual construction.

The cost variances in the specific categories are described below.

1.0 The final 'Material Costs' were $1.28 million, approximately $381,000 more than expected at the time of filing. This difference can be attributed to: pipe coating changes (variance of $207,000) and valve requirements not identified at the timing of the filing (variance of $103,000).

At the time of filing, the pipeline coating costs allowed for single fusion bond epoxy coated pipe to be used for open-trench installation, and double fusion bond epoxy pipe for segments that would be installed using trenchless methods. However, at the time of procurement, there was reason to believe that unfavorable ground conditions would be encountered. Due to the uncertainty on the amount of pipe that would be installed using open trench methods, and the risks associated with having to apply additional coating during construction at a cost premium, a decision was made to coat additional pipe with double fusion bonded epoxy. Furthermore, based on the results of the geotechnical investigation, a higher grade coating was applied to the pipeline section crossing Highway 417.

Final design of the Canadian National ("CN") Railway crossing's design required additional valves on the NPS 12, an NPS 16 casing, and pre-engineered concrete slabs, all of which were not anticipated.

2.0 The final labour cost was $7.52 million, approximately $2.4 million higher than the estimate originally provided.

The labour budget at the time of the LTC filing did not account for the complexities associated with the final pipeline route, working space and work period restrictions, and other constructability challenges. The geotechnical profile was also challenging, as rock was present along approximately 500m of the proposed pipeline route in addition to the Highway 417 crossing. As a result of these factors, the construction phase which was originally anticipated to entail a four month timeframe, required approximately six months to complete.

The CN railway permitting requirements contributed to an increase in labor costs of $150,000.

3.0 The final external costs were $915,000, approximately $716,000 more than the original estimated cost. The primary reason for the difference was due to the engineering assessments required by the City of Ottawa and CN Railway as part of their special permitting requirements.

The engineering assessments originally consisted of standard deliverables requested by the Ministry of Transportation as part of the permitting process. These included a Highway 417 drill design, geotechnical report, instrumentation and monitoring plan, and on site settlement monitoring during the pipeline installation across Highway 417. An environmental assessment and monitoring plan were also completed for the project. Additional costs were incurred as the City of Ottawa imposed timing and lane restrictions for conducting field related work, which resulted in night and weekend work that was unforeseen. These restrictions not only affected the assessments but also the associated on-site monitoring activities throughout the duration of this project. There were also additional engineering assessments required by municipal and special permitting agencies.

As part of its permitting conditions, the CN Railway requested several revisions to the NPS 12 pipeline design and construction criteria for the installation below the railway bridge. These conditions included on-site settlement monitoring during the installation, which was unanticipated.

4.0 The final land costs were $252,000, approximately $177,000 higher than the original budgeted cost, primarily due to the need for permanent easements. These were not planned for at the time of filing, although contemplated as a possibility[1].

Permanent easement was acquired in places where the pipeline could not be installed in the public road allowance. This is due to the presence of existing utilities as well as the challenges associated with the maintenance of the asset in the long term.

5.0 The final overhead costs were $650,000, approximately $332,000 higher than the original estimate, as a result of delays to the project's original timeline. Due to the complexity of the project, the design, permitting requirements, and construction of the project were more resource intensive than originally anticipated.

6.0 The contingency amount that was forecasted for this project was used.

Conclusion

The NPS 12 Innes Road Pipeline Replacement Project was completed with a total project cost of $10.6 million, approximately $3.37 million higher than the application estimate. The primary reason for the variance was the level at which the project scope was defined which impacted the design, permitting and construction, and the insufficient contingency to address the level of definition.

Lessons Learned for Future Projects

This project was planned in the same time period as the Ottawa Reinforcement[2] project and suffered similar planning deficiencies. As with the Ottawa Reinforcement Project, the contingency for Innes Road Replacement Project was underestimated at the time of project cost estimation for the application. Pipeline projects require budget and resource commitments earlier in the project development phase, to effectively establish a well-defined project scope. This includes advanced geotechnical assessments along the entire pipeline route, which will confirm subsurface conditions and provide more clarity around the foreseeable project costs associated with construction. In cases where detailed scope information is not available during the preliminary phase of a project, sufficient contingency needs to be

[1] EB-2012-0438 Exhibit D, Tab 1, Schedule 1, Paragraph 2 *"Enbridge does not foresee having to acquire any permanent easements as the preferred route follows the public road allowance. In areas where a dedication by-law has not been registered on title, Enbridge will confirm with the City of Ottawa that those parcels are public road allowance. In the event a location is deemed not to be public road allowance, Enbridge will move the main onto public road allowance. In the unlikely event that the latter is not possible, then an easement will be acquired."*

[2] EB-2012-0099 Leave To Construct application filed June 28, 2012

considered, to accommodate unanticipated items excluded from the estimate, and possible scope variation.

The improvements identified in the Ottawa Reinforcement Post Construction Financial Report[3] are relevant, and are being implemented[4].

[3] EB-2012-0099 Post Construction Financial report filed May 6, 2015

[4] EB-2015-0194 Leave To Construction application (filed June 30 2015) included contingency costs to accommodate unanticipated items and scope variations.