

**Ottawa Reinforcement Project
Interim Post Construction
Environmental Monitoring
Report**

EB-2012-0099



Prepared for:
Enbridge Gas Distribution Inc.
500 Consumers Road
North York, ON M2J 1P8

Prepared by:
Stantec Consulting Ltd.
400-1331 Clyde Avenue
Ottawa, ON K2C 3G4

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Introduction
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1.0 INTRODUCTION

1.1 BACKGROUND

Enbridge Gas Distribution Inc. ("Enbridge") filed an application with the Ontario Energy Board ("the Board") on June 28, 2012 under section 90 of the Ontario Energy Board Act, 1998, S.O. 1998, c. 15, Schedule B, (the "Act") for an order granting leave to construct a natural gas pipeline to reinforce the existing distribution network in the City of Ottawa ("the Ottawa Reinforcement Project" or the "Project"). The Ottawa Reinforcement Project is required to supply the existing customer base, as well as provide additional supply to forecasted customers. The constructed pipeline includes approximately 20 km of 610-mm (24-inch) diameter extra high pressure (XHP) steel pipeline. The Board assigned the application file number EB-2012-0099. The pipeline originates from Enbridge's Richmond Gate Station (located on Fallowfield Road approximately 2 km west of Huntley Road) and ends in the vicinity of West Hunt Club Road and Greenbank Road (Appendix A.1).

In support of the leave for construction and the application to the Board, Enbridge filed an Environmental Report ("ER") (Dillon Consulting Ltd., 2012) indicating a preferred route selection, identifying potential impacts resulting from construction, and mitigation measures to minimize environmental and socio-economic impacts. On November 29, 2012, the Board granted Enbridge approval to construct the pipeline to supply natural gas to the Ottawa Reinforcement Project.

Enbridge contracted Dillon Consulting Ltd. (Dillon) to assist in establishing an environmental inspection program to ensure that all environmental terms and conditions, and other commitments identified in the ER, were complied with during all phases of construction of the pipeline. Dillon mobilized Environmental Inspectors to maintain compliance with all approval documentation and best industry practices. An Environmental Inspector was present for full-time inspection during all key construction activities (e.g., watercourse crossings, hydrostatic test discharge). The responsibilities of the Environmental Inspector(s) generally include the following:

- Provide guidance to the Project Manager and Pipeline Inspectors regarding compliance with environmental legislation, regulations and industry standards.
- Ensure that commitments made in the ER were carried out as planned and recommend additional protection measures, if required.
- Provide advice regarding adherence to environmental specifications and commitments made in the previously mentioned documents and to regulatory agencies, including the Board.
- Provide advice on erosion and sediment protection measures to be taken in sensitive locations including watercourse crossings, wetlands.

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- When required, act as a liaison between Enbridge and regulatory agencies.
- Identify and provide direction to remediate any unexpected environmental occurrences (e.g., failure of environmental protection measures, damage to protection measures resulting from unexpected storms, residents/landowners concerns).
- Report spills to the Ministry of the Environment ("MOE") as required.
- Provide advice on requirement and placement of erosion and sediment control environmental protection measures.
- Full-time monitoring for all watercourse crossings when undertaken using horizontal directional drill ("HDD") methods.
- Document the implementation and effectiveness of environmental protection measures, noting deficiencies and suggesting methods to address environmental deficiencies.
- Maintenance of a photographic log documenting environmental protection activities.
- Monitoring reclamation activities and site stabilization measures.
- Documentation of construction activities and how the environment was protected during construction.
- Provide immediate advice regarding spill prevention and contingency measures.

Enbridge has subsequently completed construction of the Project and the pipeline was energized on February 6, 2014. As part of the Conditions of Approval, Enbridge was required to file an Interim Monitoring Report to the Board within six months of the in-service date (report contained herein). Stantec Consulting Inc. ("Stantec") has been retained by Enbridge to complete the Interim monitoring Report, contained herein.

1.2 SCOPE OF THE INTERIM MONITORING REPORT

This report has been prepared in accordance with the Ontario Energy Board EB-2012-0099 Conditions of Approval as described below:

- 3.1 Both during and after construction, Enbridge shall monitor the impacts of construction, and shall file four copies of both an interim and a final monitoring report with the Board. The interim monitoring report shall be filed within six months of the in-service date, and the final monitoring report shall be filed within fifteen months of the in-service date. Enbridge shall attach a log of all complaints that have been received to the interim and final monitoring reports. The log shall record the times of all complaints received, the substance of each complaint, the actions taken in response, and the reasons underlying such actions.
- 3.2 The interim monitoring report shall confirm Enbridge's adherence to Condition 1.1 and shall include a description of the impacts noted during construction and the actions

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taken or to be taken to prevent or mitigate the long-term effects of the impacts of construction. This report shall describe any outstanding concerns identified during construction.

- 3.3 The final monitoring report shall describe the condition of any rehabilitated land and the effectiveness of any mitigation measures undertaken. The results of the monitoring programs and analysis shall be included and recommendations made as appropriate. Any deficiency in compliance with any of the Conditions of Approval shall be explained.

This report is limited to items identified prior to July 14, 2014. Items addressed after this date will be identified in the Final Monitoring Report. This report summarizes actual construction procedures and identifies significant deviations from proposed construction activities.

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2.0 ENVIRONMENTAL PROTECTION MEASURES

Potential adverse environmental effects for the pipeline were avoided during routing by locating the pipeline mainly within existing and previously disturbed road allowances. A short portion of the project travels through property owned by TransCanada Pipelines Limited (TCPL) from the Richmond Gate Station to Flewellyn Road. Other potential adverse environmental effects of construction and operation were reduced by implementing specific construction methodologies and timing construction of certain segments of the pipeline.

Potential environmental impacts to wetlands and watercourses were reduced by isolating sensitive features along the proposed route and mitigating effects on wetlands (both unevaluated and provincially significant wetlands (PSWs)) and the eight identified watercourses (five permanent; three seasonal) located along the ROW (Appendix A.1, Appendix B.1). Potential impacts to these wetlands and watercourses during construction may have included surface soil erosion adjacent to the watercourses, trench slumping, and in extreme cases, sedimentation or other releases of deleterious substances. As a precautionary measure, the five permanent watercourse crossings were completed by HDD during the summer months when fish were not anticipated to be migrating or spawning, and when the water flow was anticipated to be low. The three seasonal watercourse crossings occurred through open cut in the summer months, preferably when the stream was dry. Some other potential terrestrial impacts were also reduced by utilizing an HDD installation method to avoid other sensitive areas identified in the ER and to limit the overall need for reclamation on exposed surfaces.

2.1 SEDIMENT AND EROSION CONTROL

During wet times, construction activities were generally limited whenever possible to reduce potential impacts from the movement of heavy machinery causing rutting in the soil and by increasing exposure of sedimentation on local watercourses from erosion and runoff.

2.2 HORIZONTAL DIRECTIONAL DRILLING

The primary concerns regarding the potential effects of pipeline construction on fish and fish habitat are species viability and potential impacts during spawning/nursery activities. Potential construction effects during HDD include siltation and sedimentation during a surface release of bentonite bore mixture, erosion of stream banks, and disruption of downstream flow and migration patterns. Extensive mitigation measures were taken to minimize effects during HDD crossings by reducing the potential for sedimentation and contamination of the watercourse through a release of 'inadvertent returns' of bentonite bore mixture within the bed and/or banks of the watercourse. The potential release of bentonite bore mixture along the flood plain parallel to the banks of watercourses was mitigated through preparation and installation of protection measures prior to the onset of drilling, while potential releases within the bed and banks of watercourses were mitigated through release preparedness and having the appropriate spill

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response materials and other resources (e.g., vacuum trucks) readily available at all times during drilling. All releases were reported to the MOE's Spills Action Centre immediately after discovery.

To prevent potential hazardous petroleum products or other deleterious substances from entering a watercourse, storage of these materials was kept at greater than 100 m from the watercourses where possible. Temporary erosion and sediment control measures (e.g., silt fencing, straw bales) were installed prior to drilling (where required) and maintained until 100% of all work within or near a watercourse, including restoration, had been completed and stabilized.

Despite the two releases of bentonite drilling mixture (as discussed in Section 3.3), HDD-bored crossings reduced the potential for sedimentation in watercourses by avoiding disturbances to banks and streambeds.

2.3 WATER WELL MONITORING PROGRAM

To document groundwater quality and groundwater levels, nearby well owners were given the opportunity to participate in a water well monitoring program. Pre-construction monitoring was completed prior to construction activities and with the land owners' permission. Monitoring included water quality sampling, and depending on well accessibility, static and pumping water level monitoring. For dug wells, the water level monitoring program included logger installation where possible and was completed by a licensed well contractor. Depending on access, continuous monitoring was conducted at dug wells as they were considered to be at a greater risk of potential interference.

2.4 RECLAMATION

Reclamation and re-vegetation of the ROW was progressive and on-going with the installation of the pipeline. The slopes were normally re-seeded as soon as practical following construction activities, with the addition of a layer of erosion control blankets to assist propagation of the seed mixture and stabilize against erosion. Seeded areas were protected with standard stabilizing techniques. Where installed, sediment control fencing was monitored and maintained throughout construction, restoration, and reclamation until vegetative cover was fully established, and then removed.

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3.0 ISSUES AND RESOLUTIONS

During the installation of the pipeline, residents' concerns were logged, addressed as quickly as feasible and followed-up by Enbridge to limit potential residual effects as a result of the Project. Any spills and/or releases into the environment as a result of the Project were reported to the MOE's Spills Action Centre as quickly as feasibly possible and follow-up reporting and impact assessments were conducted as required. However, some public concerns and restoration measures have yet to reach a resolution, including some final restoration of the site. A summary of the issues supplemental to those anticipated in the ER is contained in Table 3-1 and in Appendix C.1.

3.1 PUBLIC INQUIRIES AND CONCERNS

3.1.1 General Issues

A total of 51 comments were received from residents, businesses, and institutions. For all inquiries or concerns expressed from residents during construction of the pipeline, Enbridge has addressed concerns and maintained good landowner relations in an expeditious and courteous manner. Currently, 6 of the 51 concerns remain unresolved (1 crop loss, 1 noise, 1 discharge pump, 1 regarding natural gas servicing and 2 regarding restoration), with Enbridge working to address all remaining situations. For a log of detailed landowner concerns, follow-up actions/response and the status for each inquiry or concerns, see Appendix C.1.

3.1.2 Pipeline Energization

Natural gas containing high concentrations of odourant was released into atmosphere during energization. The natural gas had high concentrations of odourant as a result of the pipe conditioning plan, with the intention to address odour-fade issues in new steel pipelines.

Enbridge responded to all "smell gas" calls as per our Emergency Response procedures. Approximately 1,030 calls were received from residents in the cities of Ottawa and Gatineau, Quebec over the odour incident. As well, there was media coverage and eight initial reports of building evacuations and on-alert notifications due to the odour. There were no environmental or public health impacts.

3.1.3 Rock Blasting

There was resident concern expressed regarding Enbridge's plan to utilize rock blasting to facilitate the installation of the pipeline along certain portions of the route. Enbridge responded promptly and explained the rationale for the approach.

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Once the extent of the shallow bedrock where the pipeline would be located was known, installation methods were evaluated using several criteria including: constructability, cost, schedule, impact to the public, and impact to the environment.

Enbridge kept affected homeowners informed of the pipeline construction and continued to converse with residents in the affected areas. All complaints and inquiries with regards to rock blasting have been addressed by Enbridge.

Enbridge provided residents and businesses along the Preferred Route with a construction communication procedure by Enbridge to address concerns and maintain good landowner relations. Despite the lack of working easements, rock blasting was completed safely and successfully with no negative impacts.

3.2 WATER WELL MONITORING PROGRAM

Sixty-five households and five businesses were contacted with respect to groundwater monitoring related to the pipeline work. Four households and one business declined participation and several households and one business were not able to be contacted or a sample was not able to be collected.

A total of 54 wells were assessed during pre-construction monitoring and compared to the Ministry of the Environment's Ontario Drinking Water Standards, Objectives and Guidelines (ODWSOG). All landowners were notified in writing of the water quality results.

Five residences near the project area were identified as having water well issues as a result of the pipeline construction. These five wells were monitored and compared to the ODWSOG. They were also compared to the pre-construction monitoring results, if the homeowner originally participated in the pre-construction monitoring program. In some cases, well chlorination and retesting was undertaken to ensure acceptable results to homeowners. All homeowner raised well issues have been addressed and resolved.

3.3 BENTONITE DRILLING MIXTURE RELEASE

Two bentonite drilling mixture releases were recorded during the HDD operations. The first release of approximately 500-750 gallons on land occurred August 1, 2013 on West Hunt Club Road (east of Cedarview Road). The spill was cleaned-up immediately after the release using a vacuum truck to collect the material. It is estimated that approximately 90-95% of the release was recovered. A small trace of the material can still be observed within the site. It was contained by sand bags at the time of the site visit. There were no impacts to ditches, culverts, catch basins, or any watercourse.

A release of approximately 300-700 gallons occurred September 7, 2013 as the result of a sump pump fault and breaching of the secondary containment zone, resulting in the slurry entering

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WC-06 immediately adjacent to the drill set up. The spill was quickly confined and the watercourse was re-routed around the spill using the water diversion system used in the crossing of WC-02. Additional erosion control features (i.e., straw bale check dams within the watercourse channel and added silt fencing) were added to provide added filtration capacity and containment; approximately 95% of the release was recovered. A small amount of accumulated material was observed on the vegetation located along the edges of the watercourse; however, given the small quantities of material, it was likely flushed away during the next rainfall event.

On September 10 and 11, 2013, the site was re-surveyed to document any fish mortalities or signs of distress in aquatic organisms. No fish mortalities were observed and there were no signs of distress in aquatic organisms. In addition, during the September 11, 2013 site survey conducted with Hal Stimson from the Rideau Valley Conservation Authority, several schools of fish were observed within the spill area, which exhibited no signs of distress. Therefore, residual effects are not anticipated as a result of the drilling fluid release.

3.4 HYDROSTATIC TEST

3.4.1 Permit To Take Water

Enbridge had an agreement with the Goulbourn Quarry (owned and operated by Thomas Cavanaugh Construction Ltd.) to take water for use in the Hydrostatic Test. Volumes of water taken by Enbridge were within the daily water taking limits outlined in Cavanaugh's PTTW No. 0606-8XMKTs. However, the Ministry of Environment issued a letter dated November 29, 2013 indicating that henceforth, under Section 34 of the Ontario Water Resources Act R.S.O. 1990, Chapter O.40., Enbridge must obtain its own PTTW for any water takings greater than 50,000 L/day.

3.4.2 Test Discharge

During dewatering for the hydrostatic test (December 1-5, 2013), daily samples of the discharge were collected to characterize the hydrostatic test water. A water sample was also collected from the Goulbourn Quarry five days following completion of the discharge, and an additional sample was collected from the quarry approximately one month later (January 14, 2014). All samples were submitted for laboratory analysis of volatile organic compounds (VOCs), petroleum hydrocarbon fractions F1 to F4 (PHC F1-F4), metals, and inorganics. The samples were compared to Provincial Water Quality Objectives (PWQOs) and to the Goulbourn Quarry source water sample (SW-01), collected during the filling phase of the hydrostatic test. It should be noted that the Goulbourn Quarry source water sample exceeded the PWQOs for: total aluminum, boron, cobalt, copper, iron, and lead.

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The results of the laboratory analysis of the discharge samples indicated that the PWQOs for total aluminum, boron, cobalt, copper, iron, lead, mercury, molybdenum, nickel, and vanadium were exceeded during one or more of the discharge sampling events.

Five days later, only concentrations of boron, cobalt, and vanadium were found to exceed the PWQOs in the Goulbourn Quarry. Approximately one month later (January 14, 2014), all analyzed parameters in the Goulbourn Quarry met the PWQOs. Therefore, no further characterization of the Goulbourn Quarry was required.

3.5 BY-LAW NON-COMPLIANCE

We have received no record of by-law non-compliance issues related to the installation of the pipeline.

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Table 3-1 Summary of Environmental Issues and the Resolutions

Activity	Duration	Issues	Resolutions
Right-of-Way Preparation and Pipeline Installation	Duration of Construction	<ul style="list-style-type: none"> Clearing of vegetation was extended beyond the allowed boundary 2 to 5 m into the Gate Station PSW. In addition, swamp matting extended into the PSW and crushed vegetation, primarily willow species and cattails. Stripping of topsoil and excavation required the use of sediment and erosion control measures to prevent sedimentation in adjacent watercourses. Wildlife mortalities (i.e., one milksnake, one red-bellied snake, six fish). Snapping turtle nest located directly in the pipeline path. Equipment (including pumps used to dewater the trenchline) was located on property owned by the National Capital Commission (NCC), which did not grant permission for this activity. Deficiencies observed with erosion and sediment control structures (e.g., de-watering set up adjacent to the Monahan Drain; water diverted from WC-03 into drainage ditch was noticeably cloudy; sediment basin located along Moodie Road was backflowing). 	<ul style="list-style-type: none"> A remediation plan was developed and vegetation cleared in the PSW was restored. After all spoil was replaced and final grade of ditch was restored, all backslopes and road embankments were either hydroseeded or mulched to assist in establishment of vegetation. Maintained temporary sediment and erosion protection until soil stabilized and re-vegetated. Work crews informed to take additional caution when moving vehicles/equipment to ensure no wildlife (e.g., snakes) were harmed. Additional fish survey and relocation performed in area of fish mortalities. Snapping turtle nest relocated to the Rideau Valley Wildlife Center where the eggs were incubated. The site foreman was notified and the equipment (including the pump outlets) was repositioned off NCC property. Work crews were notified that equipment must not extend onto NCC property at any time. Erosion and sediment control deficiencies addressed (e.g., filter bag added to prevent excessive sediment from entering WC-03 and filter bags added to several dewatering pump outflows; relocation of sediment bags, addition of straw bale check dams and erosion control matting; creation of a new basin adjacent to the existing basin located along Moodie Road to prevent water from exiting the basin unfiltered).

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Activity	Duration	Issues	Resolutions
HDD	Duration of Construction	<ul style="list-style-type: none"> Bentonite bore mixture release (two occurrences) during HDD rock bore (reported to the Spills Action Centre). The first release (approx. 500-750 gallons on land) occurred on August 1, 2013. No waterways, ditches, culverts, catch basins or storm sewers were affected. 90-95% of the release was recovered. The second release (approx. 300-700 gallons on land) occurred on September 7, 2013. The sump pump faulted and the secondary containment zone was breached, which resulted in the slurry entering WC-06 immediately adjacent to the drill set up; water flow was present at the time of the spill. 95% of the release was recovered. 	<ul style="list-style-type: none"> Followed the mitigation measures as outlined in the Project ER. Scheduled the HDD of sensitive watercourse crossings to avoid sensitive spawning and/or migration periods. A bentonite mixture release contingency plan was discussed and implemented prior to the start of any HDD. Installed appropriate environmental protection measures (e.g., silt fence, straw bales, sand bags) around all sensitive features prior to initiating drilling. Ensured a minimum of one vacuum truck was available at all times during drilling for immediate response. Additional vacuum trucks were mobilized to sites as required (i.e., for cleanup during the second release on September 7, 2013). Only bentonite-based bore mixture was utilized during drilling, without the use of any additional additives. Environmental Inspectors and a labourer supplied by the Contractor were on-site full-time for the sensitive watercourse crossings. For the release in WC-06 (September 7, 2013), the spill was quickly confined and the watercourse was re-routed around the spill using the water diversion system used in the crossing of WC-02. Additional erosion control features were added to provide extra filtration capacity and for containment (i.e., straw bale check dams within the watercourse channel and additional silt fencing). A joint inspection of all watercourses and the area of the September 7, 2013 HDD spill (WC-06) was conducted with Hal Stimson from the Rideau Valley Conservation Authority. As a result, improvements were made to sediment and erosion control features along the pipeline route. The spills were reported to the authorities within an acceptable time frame.

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Activity	Duration	Issues	Resolutions
Reclamation	Duration of Project	<ul style="list-style-type: none"> Exposed soil has potential to allow for erosion. 	<ul style="list-style-type: none"> After all spoil was replaced and final grade of ditch was restored, all backslopes and road embankments were either hydroseeded or mulched to assist in establishment of vegetation.
Slope Stabilization	Duration of Project	<ul style="list-style-type: none"> Weather conditions occasionally resulted in erosion and subsequent sedimentation on steep slopes within the ditchline on various areas along the ROW. 	<ul style="list-style-type: none"> Installed erosion control blankets in the bottom of the ditchline to prevent erosion during high velocity flows and storm events. Straw bale check dams were intermittently installed along watercourses.
Hydrostatic Testing	November/December 2013	<ul style="list-style-type: none"> The volumes of water removed from the Goulbourn Quarry (owned and operated by Thomas Cavanaugh Construction Ltd.) were within the daily water taking limits outlined in Cavanaugh's PTTW No. 0606-8XMKS. However, the MOE issued a letter indicating that Enbridge was required to obtain a separate Permit to Take Water (PTTW) under Section 34 of the Ontario Water Resources Act R.S.O. 1990, Chapter O.40. De-watering of pipeline upon completion of hydrostatic test. 	<ul style="list-style-type: none"> The MOE issued a letter dated November 29, 2013 indicating that henceforth, Enbridge must obtain its own PTTW for any water takings greater than 50,000 L per day. Baseline water samples were collected prior to de-watering and compared against water samples of discharged water to monitor any potential effects on aquatic resources as a result of de-watering (see Section 5.2 for results).

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Activity	Duration	Issues	Resolutions
Pipeline Energization	February 2014	<ul style="list-style-type: none"> Natural gas containing high concentrations of odourant was released into atmosphere during the controlled purge of the new pipeline. The natural gas had high concentrations of odourant as a result of the pipe conditioning plan, with the intention to address odour-fade issues in new steel pipelines. As well, there was media coverage and eight initial reports of building evacuations and on-alert notifications due to the odour. 	<ul style="list-style-type: none"> Approximately 1,030 calls were received from residents in the cities of Ottawa and Gatineau, Quebec over the odour incident. Enbridge responded to all "smell gas" calls as per their Emergency Response procedures. There were no environmental or public health impacts.
Well Water Monitoring	Duration of Project	<ul style="list-style-type: none"> Landowners with water wells within 15 m of the project area were given the opportunity to participate in a water monitoring program. Fifty-four samples were collected and the results were sent in writing to each landowner. 	<ul style="list-style-type: none"> Five households raised concerns regarding the results. Enbridge took corrective action, including installing chlorination systems and retesting.
Rock Blasting	During pipeline installation	<ul style="list-style-type: none"> Residents were expressed concern regarding the plan to utilize rock blasting to facilitate the installation of the pipeline along certain portions of the route. 	<ul style="list-style-type: none"> Enbridge responded promptly and explained the rationale for the approach in an effort to address the identified concerns. Enbridge kept affected homeowners informed of the pipeline construction and continued to converse with residents in the affected areas. All complaints and inquires with regards to rock blasting have been addressed by Enbridge. Enbridge provided residents and businesses along the Preferred Route with a construction communication procedure by Enbridge to address concerns and maintain good landowner relations.

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4.0 ENVIRONMENTAL IMPACTS

To minimize the potential environmental effects resulting from the Project, communication was ongoing between Enbridge staff, the Contractor, the Environmental Inspector(s), and landowners and agencies (and/or their representatives) during all phases of construction.

4.1 HORIZONTAL DIRECTIONAL DRILL

Two bentonite drilling mixture releases were recorded during the HDD operations. Appropriate corrective action was taken immediately and the spills were largely contained. Residual environmental effects are not anticipated as a result of the two drilling fluid releases.

4.2 HYDROSTATIC TEST DISCHARGE

Laboratory analysis of the quarry after hydrostatic discharge was added indicated that the PWQOs for total aluminum, boron, cobalt, copper, iron, lead, mercury, molybdenum, nickel, and vanadium were exceeded during one or more of the discharge sampling events. The Goulbourn Quarry source water sample that was collected for comparison exceeded the PWQOs for: total aluminum, boron, cobalt, copper, iron, and lead. Within five days only boron, cobalt, and vanadium were found to exceed the PWQOs in the Goulbourn Quarry and within a month all analyzed parameters in the Goulbourn Quarry met the PWQOs. No residual environmental effects are anticipated and no further characterization of the Goulbourn Quarry will be completed as a result.

4.3 OUTSTANDING RESTORATION

Enbridge has addressed restoration of sites as much as practical throughout pipeline construction. Final restoration of the surface disturbances are recommended to address any outstanding environmental issues prior to completing reclamation. Upon stabilization of soils using vegetation to inhibit erosion, all silt fences, sand bags and other non-organic materials should be removed from the site and be disposed of at a facility approved to handle such waste. In the event erosion occurs prior to completion of the remaining restoration work, erosion control matting/blankets should be installed to limit further potential for erosion and subsequent sedimentation down-gradient.

Stantec proposes the following mitigation and reclamation measures to stabilize exposed areas:

1. Excavations between Fallowfield Road and Flewellyn Road and along the north side of Flewellyn Road should be refilled with native material and hydroseeded. Erosion control blankets should be used where appropriate (e.g., Photo 2, 3, 5; Appendix B).

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2. In several areas germination was not sufficient to fully stabilize exposed soils. These areas should be augmented by hydroseeding to prevent erosion. Stantec recommends that all previously disturbed areas be vegetated to restore pre-construction conditions, primarily the following locations:
 - a. Bare areas along the north side of Flewellyn Road from the western terminus of the site and Huntley Road should be hydroseeded and covered with erosion control blankets where appropriate to encourage vegetation establishment (e.g., Photo 8, 9; Appendix B).
 - b. Grade, stabilize and rehabilitate (as required) agriculture fields along the south side of Flewellyn Road between Shea Road and Eagleson Road, between Eagleson Road and Hope Side Road, and along Hope Side Road to Old Richmond Road (e.g., Photo 13, 14, 16, 16; Appendix B).
 - c. Bare areas along the south side of West Hunt Club Road from west of the 417 interchange to the eastern terminus at West Hunt Club and Greenbank Road should be hydroseeded and covered with erosion control blankets where appropriate to encourage vegetation establishment (e.g., Photo 21, 23; Appendix B).
3. A small amount of bentonite bore mixture remains at the location of the West Hunt Club release immediately east of Cedarview Road and Highway 416 (Photo 22; Appendix B). The remaining material should be removed and the site restored to pre-construction condition. Restoration should include grading and stabilization of the slopes (as needed) and revegetation via hydroseeding.

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5.0 SUMMARY

The majority of impacts associated with construction of the proposed pipeline and interaction with the construction of other projects were managed appropriately based on the recommendations outlined in the ER (Section 6.0). Many of the potential environmental effects for the pipeline were avoided during routing by locating the majority of the pipeline within existing and previously disturbed road allowances (A small portion of the pipeline passes through TCPL property between the Richmond Gate Station to Flewellyn Road). Other potential adverse environmental effects of construction and operation were reduced by implementing specific construction methodologies (e.g., HDD) and timing construction of certain segments of the pipeline.

Monitoring, contingency planning and environmental protection measures were important components to reduce the potential for residual and cumulative effects of the Project, ensuring mitigation measures were effective in both the short and long term. During installation of the pipeline, promptly addressing concerns raised by residents, as well as identifying potential impacts during pre-construction consulting, limited the overall effects of the Project. In addition, knowledge gained throughout this construction can be used to better identify and prevent and/or rectify problems in the future. Provided that any and all identified outstanding issues identified in this Interim Monitoring Report are addressed, no significant residual or cumulative effects on environmental and/or socio-economic features are anticipated as a result of the Project.

OTTAWA REINFORCEMENT PROJECT INTERIM POST CONSTRUCTION ENVIRONMENTAL MONITORING REPORT

Closure
August 5, 2014

6.0 CLOSURE

This Report has been prepared by Stantec Consulting Ltd. for the sole benefit of Enbridge, and may not be used by any third party without the express written consent of Enbridge. Any use which a third party makes of this Report is the responsibility of such third party.

The data presented in this Report are in accordance with our understanding of the Project as it was presented at the time of our Report. In the event that changes or alterations are made to the Project, we reserve the right to review our data with respect to any such changes.

We trust this Report meets your current requirements. Please do not hesitate to contact us should you have additional questions about any facet of this Project. Please do not hesitate to contact the undersigned if you have any questions or require further information.

Respectfully Submitted,

STANTEC CONSULTING LTD.



Alexis Fast, M.E.Des.
Environmental Scientist
Tel: (613) 784-2228
Alexis.Fast@stantec.com

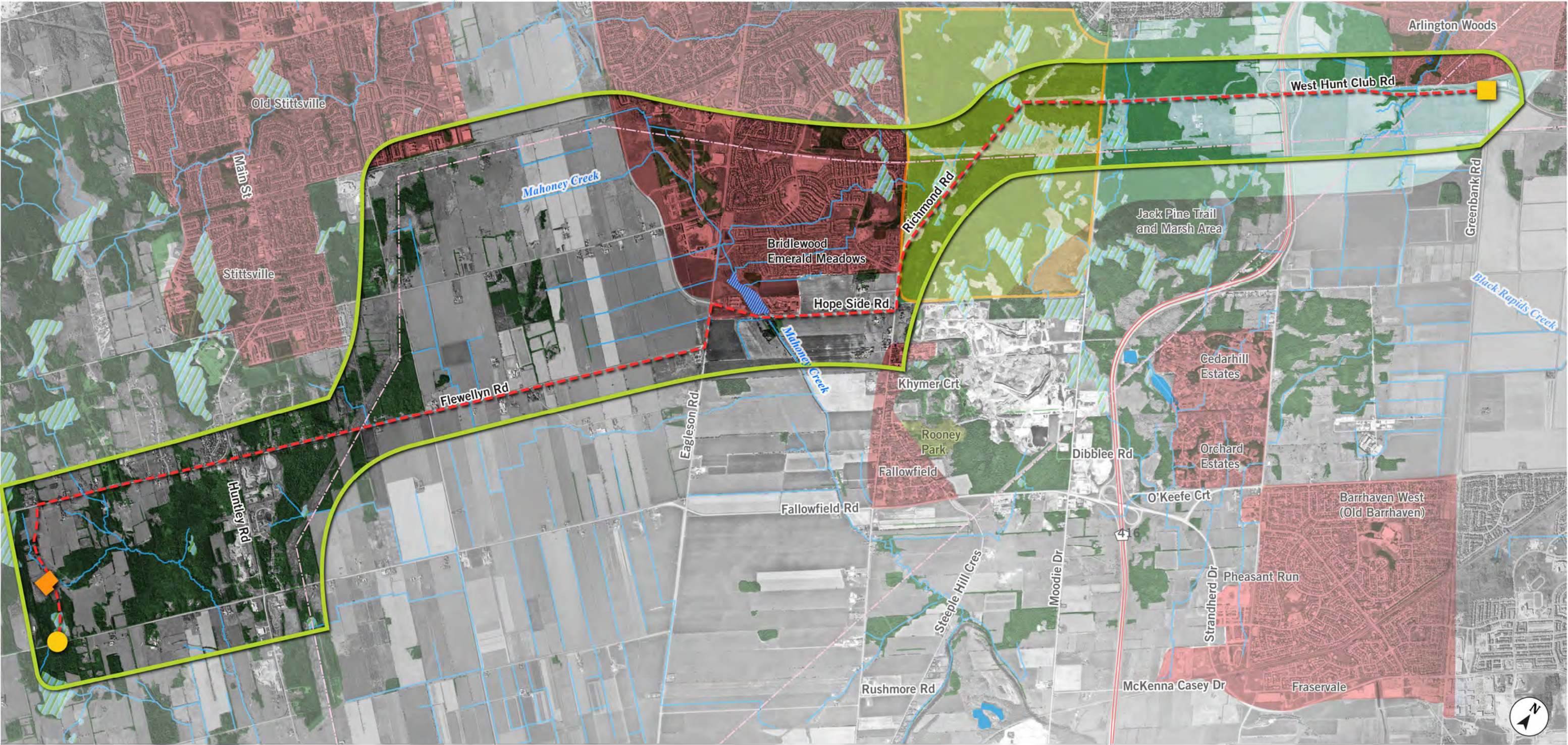


Edward Malindzak, M.Sc.
Senior Biologist
Tel: (613) 784-2297
Edward.Malindzak@stantec.com

OTTAWA REINFORCEMENT PROJECT INTERIM POST CONSTRUCTION ENVIRONMENTAL MONITORING REPORT

Appendix A
Site Location
August 1, 2014

Appendix A SITE LOCATION



ENBRIDGE GAS DISTRIBUTION INC.
Pipeline to Reinforce the City of Ottawa

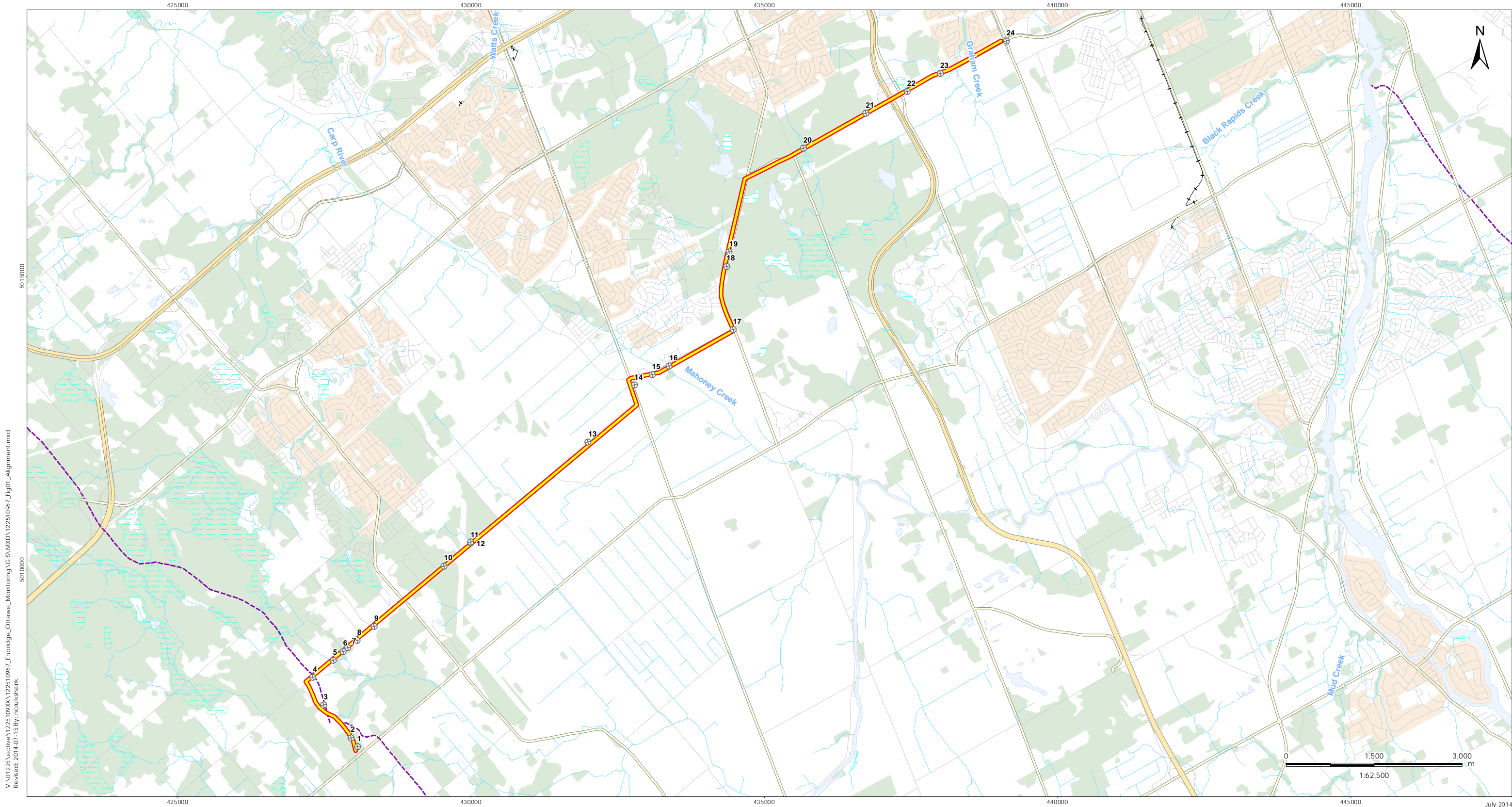
Figure 6: Preferred Route



LEGEND

- | | | | | |
|--|-----------------------------------|---|-----------------|-------------------------------|
| Highway | Preferred Route (Municipal Roads) | Start Point: Enbridge Richmond Gate Station | Watercourse | Stony Swamp Conservation Area |
| Hydro One Transmission Line & Corridor | Socio-Economic Features | End Point: Vicinity of West Hunt Club Road & Greenbank Road | Waterbody | TransCanada Pipelines Station |
| Study Area | Ottawa Western Greenbelt Area | | Parks, Woodlots | Stormwater Management Pond |
| | | | Wetlands | |

*Scale is only an estimate



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Revised: 2014-07-15 By: ncuikshank



Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

- Legend
- ⊕ Photo Location
 - Pipeline Alignment
 - Watercourse

Client/Project
Enbridge Gas Distribution Inc.
Ottawa Reinforcement Project
Interim Post Construction
Environmental Monitoring Report

Figure No.
1

Title

Alignment & Photo Locations

OTTAWA REINFORCEMENT PROJECT INTERIM POST CONSTRUCTION ENVIRONMENTAL MONITORING REPORT

Appendix B
PhotoGraphic Log
August 1, 2014

Appendix B PHOTOGRAPHIC LOG





Photo 7: Watercourse along Flewellyn Road west of Huntley Road.



Photo 8: General site restoration condition along Flewellyn Road west of Huntley Road.



Photo 9: General site restoration condition along Flewellyn Road.



Photo 10: Watercourse along Flewellyn Road east of Huntley Road.



Photo 11: Watercourse along Flewellyn Road.



Photo 12: Location of bentonite boring mixture spill on Flewellyn Road east of Shea Road.



Photo 13: ROW between Shea Road and Eagleson Road.



Photo 14: ROW with drain feature between Eagleson Road and Hope Side Road.



Photo 15: Drain feature between Eagleson Road and Hope Side Road.



Photo 16: ROW along Hope Side Road.



Photo 17: On-going residential development on Old Richmond Road.



Photo 18: Mature American Elm on Old Richmond Road.



Photo 19: Site of open cut on road shoulder adjacent wetland.



Photo 20: Wetland crossing on West Hunt Club Road.



Photo 21: West of 416 interchange on West Hunt Club Road.



Photo 22: Spill with remnant material on West Hunt Club Road. Note sandbag isolation measures in background.



Photo 23: West Hunt Club Road east of Cedarview Drive and Highway 416.



Photo 24: Eastern terminus at Hunt Club Road and Greenbank Road.

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**OTTAWA REINFORCEMENT PROJECT INTERIM POST CONSTRUCTION ENVIRONMENTAL MONITORING
REPORT**

Appendix C
SUMMARY OF RESIDENT COMMENTS AND RESOLUTIONS
August 1, 2014

**Appendix C
SUMMARY OF RESIDENT COMMENTS AND
RESOLUTIONS**

SUMMARY OF RESIDENT COMMENTS AND RESOLUTIONS

Item	Type	Date	Comment	Resolution	Status	State
1	Construction / Servicing	8-Apr-13	Resident requested information on the status of the project - expressed interest in switching to natural gas.	Enbridge representative provided information on the status of the project and information with regards to providing service. Contact information for further questions was also provided.	Complete	Closed
2	Sump Discharge	22-Apr-13	Resident concerned about sump discharge at ditch. Outlet blocked or buried during construction.	Enbridge investigated issue with homeowner to address immediate concerns of potential flooding. Sump outlet to be confirmed during Spring 2014 cleanup. Customer satisfied with action plan.	In Progress	Open
3	Restoration	25-Apr-13	Resident expressed concern about the area being reinstated correctly once construction has been completed.	Enbridge representative responded to residents' concerns.	Complete	Closed
4	Restoration	10-May-13	Resident in area of Hope Side Road requested clarification of project scope and impact to immediate area.	Enbridge provided outline of project and tentative schedule for construction on Hope Side Road.	Complete	Closed
5	Traffic	11-May-13	Resident raised concerns regarding traffic disruption along from Stonehaven to Hwy 416.	Enbridge representative responded to residents' concerns. a) Enbridge working with City of Ottawa to coordinate Traffic Management requirements of project through Municipal Permits obtained b) Provided project notification letter in advance of construction start	Complete	Closed
6	Construction / Servicing	18-May-13	Resident expressed construction concerns, scheduling and location of work along right-of-way. Potential gas service to area and timing.	Enbridge representative provided construction details for project, and indicated that a servicing plan would be developed for the area in 2014.	Complete	Closed
7	Multitple	31-May-13	Resident along the route requested information a) How far from their fence will the line and easement. b) Specifications of the pipe, flow rates and volumes. c) Histories of accidents d) What will the depth line be e) Frequencies of testing	a) Enbridge communicated details of the project Clarification of the fence line, property line and municipal right-of-way provided. Easements not required. b) Specifications/design of the pipeline available through the project website. c) Reviewed construction and safe work practices on pipelines. d) Depth of pipeline; reference to City of Ottawa utility road cross-sections. Extra depth to be applied in consideration to future road widening. e) Testing pipeline follows codes/standards (reference to website for details).	Complete	Closed

SUMMARY OF RESIDENT COMMENTS AND RESOLUTIONS

Item	Type	Date	Comment	Resolution	Status	State
8	Restoration	5-Jun-13	Resident asked about Tree removal & restoration.	Enbridge reviewed all trees along the route through consultation with Environmental Consultants. a) Trees along removed on City property along rear fence line have been documented by size /species. b) Enbridge consulted with City of Ottawa, Forestry Inspector and will replant area along Landover Crescent during reinstatement of project c) work to be completed Summer 2014 due to wet weather in Spring 2014	In Progress	Open
9	Easements	12-Jun-13	Property owner advised Enbridge trespassed on private land. Owner (consortium) not able to sign agreement for 'working rights'.	Enbridge reviewed claim with Owner representative and proceeded with payment of 'working rights' proposed in original agreement.	Complete	Closed
10.1	Blasting	17-Jun-13	Resident requested timeline for when blasting would begin in the area and project details. Items 10.1, 10.2 and 10.3 are comments from the same resident regarding blasting.	Enbridge outlined project details and construction methodology anticipated	Complete	Closed
10.2	Blasting	18-Jun-13	Resident requested details of blasting location and schedule.	Enbridge provided written response to A.Apostolakos on June 25th outlining methodology and process undertaken when constructing pipelines by Project Team. The OEB and City Councillor was copied on the response Please reference Enbridge's letter to A. Apostolakos dated June 25, 2013 that was copied to the Board.	Complete	Closed
10.3	Blasting	2-Jul-13	Enbridge was copied on a letter sent to the NCC, City councilor and the OEB citing formal opposition to blasting.	Enbridge provided response to A.Apostolakos on July 8 addressing issues of concern. a) Enbridge to communicate updates/changes in the event blasting required. b) Update of work completed August 11, blasting in area not required. Please reference Aird & Berlis' letter (on behalf of Enbridge) to A. Apostolakos dated July 8, 2013 that was copied to the Board.	Complete	Closed
11	Construction	20-Jun-13	Homeowner located across from Site Office concerned about dust/dirt in pool and home.	Enbridge increased dust control (watering roadway at entrance to Site Office). Provided compensation for cleaning windows and yards area.	Complete	Closed

SUMMARY OF RESIDENT COMMENTS AND RESOLUTIONS

Item	Type	Date	Comment	Resolution	Status	State
12	Easements	3-Jul-13	Developer requested alternative compensation for use of 'working rights' to construct pipeline along Richmond Road.	<p>Enbridge advised developer access to 'working rights' provides compensation at market value for temporary use of property including reinstatement. Priority servicing of future lands of Developer could not be leveraged through Enbridge.</p> <p>Market value compensation was provided for working rights on land during construction. Developer has accepted market value compensation.</p>	Complete	Closed
13	Blasting	25-Jun-13	Resident request blasting not be used for construction of pipeline in proximity to residence	Enbridge indicated blasting was not anticipated in proximity to Landover Crescent, and that communication would be provided in advance if blasting required.	Complete	Closed
14	Wells	10-Aug-13	Resident contacted Enbridge with concern that well water was disturbed by construction activity on Flewellyn Road.	Enbridge investigated concerns with home owners retesting of well quality. Remediation completed on well through Environmental Consultants, retesting completed with acceptable results provided to homeowner.	Complete	Closed
15	Construction	12-Aug-13	Resident expressed concern of construction disruption to business on Flewellyn Road	Project schedule was communicated along this section to resident. Signage indicating business was open was put up to alleviate concerns of losing potential customers due to construction.	Complete	Closed
16	Traffic	14-Aug-13	Quality of traffic impact mitigation along Old Richmond Road.	<p>Enbridge representative provided follow up with resident to discuss traffic control.</p> <p>Enbridge to ensure public/worker safety along West Hunt Club and Richmond Road, aware of challenges of high volume traffic. Safety remains priority.</p>	Complete	Closed
17	Construction	16-Aug-13	Request for clarification on information for the project from City Councillor's Office.	Enbridge's work plan for the Ottawa Reinforcement Project was provided to update the progress and give insight to the delays and congestion along the pipeline route.	Complete	Closed
18	Construction	16-Aug-13	Resident advised possible leaking foundation and concerns of heavy equipment/construction contributing to possible damage.	<p>Area of concern investigated by Enbridge's engineering consultant. Investigation report concluded leak was not related to construction activity.</p> <p>Residence provided disclosure of all reports.</p>	Complete	Closed

SUMMARY OF RESIDENT COMMENTS AND RESOLUTIONS

Item	Type	Date	Comment	Resolution	Status	State
19	Noise	16-Aug-13	Homeowner concerned about noise levels and construction activity near Gate Station rebuild.	Enbridge provided project scope and expected completion date for construction. Sound dampening technologies have been looked into and will be implemented. Regular updates are provided to resident on progress.	In Progress	Open
20	Blasting/ Traffic	17-Aug-13	Resident raised concern of blasting near property and timing of advanced communication. Traffic congestion and access through construction zone difficult with potential delays.	Enbridge acknowledged challenges of constructing on rural roads. Blasting was not required near property and this was communicated to resident.	Complete	Closed
21	Construction	29-Aug-13	NCC advised construction equipment in public parking zones for walking trails along West Hunt Club and Richmond Road.	Enbridge reviewed heavy equipment or commercial vehicles not to access NCC designated parking to trails.	Complete	Closed
22	Vehicle Damage	2-Sep-13	Vehicle damage claim as a result of construction.	Claim resolved through Enbridge Contractor Claims Department.	Complete	Closed
23	Construction	4-Sep-13	Homeowner indicated concerns of water entering rear yard off Flewellyn during heavy rain.	Enbridge reviewed changes in drainage during construction. Grade was built up modified to keep water from fence line.	Complete	Closed
24	Unrelated	5-Sep-13	Resident would like to complete landscaping and wanted to know if there was any further work to be completed at 1 Woodbine Place Ottawa (Woodbine between Barton and Grosvenor).	Resident was directed to Regional Construction Department for follow-up. Location of Resident was not in geographical area of Ottawa Reinforcement Project – unrelated issue.	Complete	Closed
25	Traffic	9-Sep-13	Resident of Flewellyn seeking compensation for disruption of traffic and additional commute time to work.	Enbridge acknowledged construction has been disruptive to local residents and those commuting through Flewellyn Road. Enbridge provided advance communication of projects to ensure residence have opportunity preplan alternative travel routes or gain insight on schedules.	Complete	Closed
26	Traffic	11-Sep-13	Resident concern of pipeline construction through high volume traffic corridor and access by emergency vehicles.	Response provided to Coucillor's Office addressing traffic management and priority given to emergency vehicles. The City of Ottawa Traffic Management Department provides direction to emergency vehicles and school buses avoiding construction zones through permitting process.	Complete	Closed
27	Vehicle Damage	11-Sep-13	Vehicle damage claim as a result of construction.	Claim resolved through Enbridge Contractor Claims Department.	Complete	Closed

SUMMARY OF RESIDENT COMMENTS AND RESOLUTIONS

Item	Type	Date	Comment	Resolution	Status	State
28	Wells	20-Sep-13	Resident noticed the company installing the gas pipeline has been pouring concrete continually into holes that they drill in the ground near the corner of Flewellyn and Shae. What are they doing and why, and what impact is it having on the environment, specifically ground water? Will it affect the wells around here?	Enbridge representative provided a detailed description of the work being completed at this location and addressed the concerns. Observations related to horizontal directional drilling through rock; requires circulation of drilling fluids during drilling operation. It was explained to resident that it was not concrete and there was no impact to well water.	Complete	Closed
29	Vehicle Damage	21-Sep-13	Vehicle damage claim as a result of construction.	Claim resolved through Enbridge Contractor Claims Department.	Complete	Closed
30	Vehicle Damage	22-Sep-13	Vehicle damage claim as a result of construction.	Claim resolved through Enbridge Contractor Claims Department.	Complete	Closed
31	Restoration	25-Sep-13	Farmer contacted Enbridge regarding gate access off WHC and construction equipment blocking access to fields. Existing gate removed due to construction needs to be replaced.	Enbridge informed Farmer that the land owner (NCC) was aware of construction of pipeline prior to mobilization of crews. Advised gate to be restored late Fall. Replacement of gate scheduled during reinstatement activities.	Complete	Closed
32	Construction	29-Sep-13	Resident concerned with traffic on Flewellyn Road, noise and dust. Issue of drainage from property to adjacent TCPL Easement of concern due to past problems when TCPL lines installed.	Enbridge reimbursed customer for expenses to clean windows (result of excavation through TCPL Easement). Drainage reviewed in Spring 2014. a) Meeting with homeowner and advised existing drain tile restored at time of construction. Issues of drainage predate construction by Enbridge . b) Drainage issues in right-of-way also reviewed with City Inspector with no concerns related to Enbridge. c) Homeowner advised to follow up with TCPL	Complete	Closed
33	Servicing	30-Sep-13	Service Request	Enbridge advised resident Enbridge would review servicing along the pipeline route in greater detail during 2014.	In Progress	Open
34	Construction	5-Oct-13	Enbridge Project Update - Sent to City of Ottawa and Councillors impacted by project.	Update of the present status for the project with respect to construction activity.	Complete	Closed

SUMMARY OF RESIDENT COMMENTS AND RESOLUTIONS

Item	Type	Date	Comment	Resolution	Status	State
35	Traffic	9-Oct-13	Resident raised concern with the safety for drivers on Old Richmond Road at night. Traffic cones have been downed causing difficulty to get around.	Enbridge representative provided follow-up: Enbridge has a contractor checking traffic cones daily and the start of each day to reposition. This includes weekends to ensure cones are not moved or become hazards.	Complete	Closed
36	Construction	10-Oct-13	Request to continue to receive status updates as they are very helpful from a community awareness perspective.	Updates provided to Coucillors as project changes or schedules developed impacting residence.	Complete	Closed
37	Traffic	11-Oct-13	Complaint regarding traffic and safety measures and distraction of lighting interfering with view of drivers.	Enbridge representative provided a detailed response to address concerns. Traffic management and road set up are monitored on a regular basis and adjusted.	Complete	Closed
38	Restoration	24-Oct-13	Resident complaint of asphalt damage on West Hunt Club and Richmond Road by Enbridge.	Enbridge was working with City of Ottawa and will assess reinstatement requirements Spring 2014.	In Progress	Open
39	Vehicle Damage	30-Oct-13	Vehicle damage claim as a result of construction.	Claim resolved through Enbridge Contractor Claims Department.	Complete	Closed
40	Vehicle Damage	31-Oct-13	Vehicle damage claim as a result of construction.	Claim resolved through Enbridge Contractor Claims Department.	Complete	Closed
41	Pipeline Testing	6-Nov-13	Resident inquired whether studies have been undertaken to assess the impact of a rupture and the increased risk of a rupture due to ground vibrations from adjacent traffic	Enbridge responded to concerns of pipeline location and requirements to meet regulatory requirements for testing pipelines and installation.	Complete	Closed
42	Restoration	12-Nov-13	Resident concerned about reinstatement profile of ditch and proximity to existing box culvert/creek; potential flooding of property during Spring.	Enbridge confirmed with City of Ottawa that completed restoration was acceptable. Monitored results in Spring 2014 to ensure water flow in ditch was acceptable. A post construction ditch profile was completed and compared to pre-construction ditch profile. Results were shared with resident.	Complete	Closed
43	Restoration	21-Nov-13	Resident investigating work on Crownridge (near Hope Side Road) and reinstatement of trench adjacent to sidewalk.	Enbridge confirmed work related to rectifier installation. Clean up of trenching to be temporarily reinstated with final clean up Spring 2014.	Complete	Closed
44	Construction	6-Dec-13	NCC identified signage removed/damaged in several locations along park trails.	Signage replaced.	Complete	Closed
45	Traffic	16-Dec-13	Resident observed tires being pulled up along West Hunt Club and concerned.	Response indicated the tires material is part of the base support used for traffic control signage and not being excavated.	Complete	Closed

SUMMARY OF RESIDENT COMMENTS AND RESOLUTIONS

Item	Type	Date	Comment	Resolution	Status	State
46	Unrelated	18-Jan-14	Homeowner received Enbridge correspondence and sought clarification of the term 'vital main'.	Project Team advised address was not in scope of Ottawa Reinforcement Project.	Complete	Closed
47	Sump Discharge	30-Jan-14	Homeowner advised Enbridge of water problems related to the sump tank discharge being blocked.	Enbridge advised pipeline Contractor to further investigate claim. Potential for sump discharge to be blocked by ice/snow at ditch line. Claim has been resolved and compensation paid for damages by Contractor.	Complete	Closed
48	Energization	6-Feb-14	Natural gas containing high concentrations of odourant was released into atmosphere during the controlled purge of the pipeline. Approximately 1,030 calls were received from residents in the cities of Ottawa and Gatineau, Quebec over the odour incident.	Enbridge responded to all "smell gas" calls as per our Emergency Response procedures. There were no environmental or public health impacts.	Complete	Closed
49	Crop Loss	1-May-14	Farmer contacted Enbridge seeking compensation for crop loss.	Crop loss claim under review.	In Progress	Open
50	Restoration	5-May-14	Resident expressed concern over site restoration and debris from construction left on side of the road.	<p>Enbridge representative provided follow up and addressed concerns.</p> <p>The pipe installation for the project was completed late in 2013 and with weather conditions (snow) arriving early, Enbridge was not able to fully reinstate the all areas of the project.</p> <p>This area has now been reinstated and resident has been notified.</p>	Complete	Closed
51	Restoration	9-Jun-14	Ditch required clean up and some grading in front of Church.	Enbridge completed reinstatement of ditch.	Complete	Closed