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December 13, 2022

Filed Electronically

Canada Energy Regulator
Suite 210, 517 Tenth Avenue SW
Calgary, Alberta T2R 0A8

Attention: Ms. Ramona Sladic, Secretary of the Commission

Dear Ms. Sladic:

**Re: NOVA Gas Transmission Ltd. (NGTL)
2021 Meter Stations and Laterals Abandonment Program
(2021 Abandonment Program or Program)
Program Update No. 2
File No.: OF-Fac-Gas-N081-2022-05 01**

Per NGTL's commitment in its response to the Canada Energy Regulator's (CER or Commission) Information Requestion (IR) No. 1,¹ on August 9, 2022, NGTL provided a Program update listing the cathodic protection (CP) test stations that it proposed to remove and those proposed to be left in-place.² Since its update, NGTL's environmental consultant (Stantec Consulting Ltd.) has continued to evaluate the proposed access routes and has identified the presence of critical aquatic habitat intersecting the planned access to four CP test stations that were initially proposed to be removed. To access these CP test stations, temporary vehicle and/or equipment crossings would need to be constructed across these critical habitat watercourses. As a result, these four CP test stations are now proposed to be abandoned in-place, rather than removed (see Revised Program Update Attachment 1). Long-term effects of leaving these additional four CP test stations in-place are not expected from abandonment in-place methods, as discussed in Section 14 of the ESA.³ Access through critical habitat watercourses is not required for the remaining test stations to be removed as identified in Program Update No. 1, or for access to the planned Abandonment Activities.

In addition, NGTL provides minor updates to Attachment 4: Abandoned Pipeline Monitoring Plan, which revises NGTL's commitment for annual aerial inspections to conducting aerial inspections if/when patrolling nearby operational rights-of-way and/or in response to identified area(s) of concern or hazard(s) (see Revised Application Attachment 4).

¹ Filing ID: C19624-1, PDF page 4 of 27.

² Filing ID: C20437.

³ Filing ID: C19624-14, PDF page 351 of 406.

December 13, 2022

Ms. R. Sladic

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If the CER requires additional information with respect to this filing, please contact me by phone at (403) 920-2940 or by email at nicole_prince@tcenergy.com.

Yours truly,

NOVA Gas Transmission Ltd.

Original signed by

Nicole Prince

Regulatory Project Manager,

Regulatory Facilities, Canadian Natural Gas Pipelines

Attachments

cc. Blair Riley, Canada Energy Regulator
Shawna Cox, Canada Energy Regulator

Revised Attachment 1
List of Cathodic Protection Test Stations
Proposed to be Removed and ones to Remain In-Place

**Revised Table 1: List of Cathodic Protection Test Stations
Proposed to be Removed**

Associated Lateral Name	Test Station ID
Bison Lake Lateral (NPS 12 1994)	1844100+004.498-TS
Bison Lake Lateral (NPS 12 1994)	1844100+009.391-TS
Bison Lake Lateral (NPS 12 1994)	1844100+009.491-TS
Cessford East Lateral (NPS 8 1960)	1040600+013.915-TS
Cessford East Lateral (NPS 8 1960)	1040600+013.916-TS
Countess West Lateral (NPS 4 1976)	1602000+005.953-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+002.810-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+005.153-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+006.543-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+007.760-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+009.365-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+009.375-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+013.502-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+027.269-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+027.320-TS
Russell Creek Lateral (NPS 12 1994)	1847000+000.000-TS
Russell Creek Lateral (NPS 12 1994)	1847000+000.001-TS
Russell Creek Lateral (NPS 12 1994)	1847000+009.700-TS
Russell Creek Lateral (NPS 12 1994)	1847000+014.900-TS
Russell Creek Lateral (NPS 12 1994)	1847000+020.400-TS
Russell Creek Lateral (NPS 12 1994)	1847000+025.240-TS
Russell Creek Lateral (NPS 12 1994)	1847000+032.142-TS
Russell Creek Lateral (NPS 12 1994)	1847000+033.200-TS
Russell Creek Lateral (NPS 12 1994)	1847000+038.600-TS
Russell Creek Lateral (NPS 12 1994)	1847000+045.032-TS
Russell Creek Lateral (NPS 12 1994)	1847000+051.650-TS
Russell Creek Lateral (NPS 12 1994)	1847000+051.667-TS
Russell Creek Lateral (NPS 12 1994)	1847000+055.800-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+000.001-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+000.383-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+001.261-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+001.475-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+001.494-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+001.518-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+001.703-TS

**Table 1: List of Cathodic Protection Test Stations
Proposed to be Removed (cont'd)**

Associated Lateral Name	Test Station ID
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+001.854-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+001.863-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+002.046-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+002.346-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+002.552-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+002.582-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+003.718-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+003.818-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+003.985-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+004.304-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+004.335-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+004.339-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+004.622-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+005.509-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+006.131-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+006.134-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+006.165-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+006.427-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+006.657-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+006.678-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+007.205-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+007.215-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+007.253-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+007.266-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+007.273-TS
Sakwatamau River Sales Lateral (NPS 6 1989)	1965600+007.278-TS
Tweedie South Lateral (NPS 4 1975)	1254200+000.295-TS
Valhalla Sales Lateral (NPS 2 1987)	1108800+000.003-TS
Valhalla Sales Lateral (NPS 2 1987)	1108800+000.500-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+000.016-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+000.957-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+001.857-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+001.878-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+001.943-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+002.029-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+002.057-TS

**Table 1: List of Cathodic Protection Test Stations
Proposed to be Removed (cont'd)**

Associated Lateral Name	Test Station ID
Virginia Hills Lateral (NPS 8 1970)	1925100+002.075-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+002.082-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+002.592-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+002.643-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+002.650-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+002.661-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+002.662-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+002.694-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+002.699-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+003.896-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+004.005-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+004.070-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+004.075-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+004.732-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+004.733-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+004.735-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+006.168-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+007.032-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+008.544-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+008.700-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+011.830-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+015.305-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+019.297-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+020.024-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+022.628-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+022.647-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+022.691-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+022.702-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+022.711-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+022.726-TS
Virginia Hills Lateral (NPS 8 1970)	1925100+023.527-TS
Wayne North Lateral (NPS 6 1959)	1060400+000.032-TS
Wayne North Lateral (NPS 6 1959)	1060400+000.033-TS
Wayne North Lateral (NPS 6 1959)	1060400+002.140-TS
Wayne North Lateral (NPS 6 1959)	1060400+004.344-TS

**Table 1: List of Cathodic Protection Test Stations
Proposed to be Removed (cont'd)**

Associated Lateral Name	Test Station ID
Wayne North Lateral (NPS 6 1959)	1060400+006.870-TS
Wayne North Lateral (NPS 6 1959)	1060400+009.284-TS
Wayne North Lateral (NPS 6 1959)	1060400+010.732-TS
Winefred River West Lateral (NPS 4 1990)	1996500+000.040-TS
Winefred River West Lateral (NPS 4 1990)	1996500+010.597-TS
Winefred River West Lateral (NPS 4 1990)	1996500+010.770-TS

**Revised Table 2: List of Cathodic Protection Test Stations
Proposed to Remain in-place**

Associated Lateral Name	Test Station ID
Rambling Creek Lateral (NPS 4 1984)	1805700+017.129-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+020.106-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+024.045-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+024.560-TS
Rambling Creek Lateral (NPS 4 1984)	1805700+026.500-TS
Winefred River West Lateral (NPS 4 1990)	1996500+001.162-TS
Winefred River West Lateral (NPS 4 1990)	1996500+001.163-TS
Winefred River West Lateral (NPS 4 1990)	1996500+004.815-TS
Winefred River West Lateral (NPS 4 1990)	1996500+004.979-TS
Winefred River West Lateral (NPS 4 1990)	1996500+008.016-TS
<u>Virginia Hills Lateral (NPS 8 1970)</u>	<u>1925100+003.896-TS</u>
<u>Virginia Hills Lateral (NPS 8 1970)</u>	<u>1925100+007.032-TS</u>
<u>Virginia Hills Lateral (NPS 8 1970)</u>	<u>1925100+008.544-TS</u>
<u>Virginia Hills Lateral (NPS 8 1970)</u>	<u>1925100+008.700-TS</u>

Revised Attachment 4
Abandoned Pipeline Monitoring Plan

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ABANDONED PIPELINE MONITORING PLAN

1.0 INTRODUCTION

The Abandoned Pipeline Monitoring Plan (Monitoring Plan) for the 2021 Abandonment Program has been developed based on NOVA Gas Transmission Ltd.'s (NGTL) technical expertise and industry knowledge, as well as input from affected landowners, stakeholders and Indigenous communities. This plan provides:

- a description of risks and risk mitigation for abandoned facilities
- information concerning remediation and reclamation
- information about record retention

1.1 Plan Development

This Monitoring Plan was developed in accordance with the *Canadian Energy Regulator Act* (CER Act, 2020), the *Canadian Energy Regulator Onshore Pipeline Regulations* (OPR, 2020), *Canada Energy Regulator (CER) Filing Manual* (Filing Manual, 2021) and the most recent *Canadian Standards Association: National Standard of Canada Oil and Gas Pipeline Systems* (CSA Z662, 2019).

1.1.1 Land Matters Consultation Initiative

The National Energy Board's, predecessor to the CER, Land Matters Consultation Initiative (LMCI),¹ Stream Four, provided a forum for pipeline companies to develop and share technical information that will be applied in abandonment plans. NGTL and other pipeline companies have proposed abandonment procedures that were considered by the regulator in the context of the LMCI process that consider and ensure that adequate funding is available for abandonment.

1.1.2 Key Principles

NGTL's determination of the most appropriate method of abandonment was made considering the expected land use and is guided by three key principles:

- Safety – ensuring that the method of abandonment would minimize risk to the public
- Environmental Protection – ensuring that the method of abandonment of the facilities avoid or reduce potential environmental effects
- Cost Effectiveness – meeting safety and environmental protection objectives in a cost-effective manner

¹ <https://apps.cer-rec.gc.ca/REGDOCS/Item/View/501473>.

1.1.3 Impacts to Stakeholders

NGTL will complete the 2021 Abandonment Program in a way that avoids or limits impacts to landowners, and also avoids or reduces potential adverse effects on the environment. At this time, NGTL does not plan to surrender any of the easements or dispositions. Should NGTL decide to surrender the land rights in the future, NGTL will consult with all directly affected landowners, occupants and land users. NGTL intends to maintain the registration of those land rights in all relevant land registry systems.

2.0 RISKS AND RISK MITIGATION PLANS FOR ABANDONED IN-PLACE PIPELINES

The risks associated with abandoning pipelines in-place include the potential for corrosion, pipe perforation and collapse of the pipeline, resulting in ground subsidence or causing the pipeline to act as a conduit for water movement. Other risks include the exposure of abandoned in-place pipelines due to riverbed scour, buoyancy in wetlands, frost heave and erosion. These risks and mitigation methods, as appropriate, are discussed below.

2.1 Pipeline Corrosion and Subsidence

All pipelines for the 2021 Abandonment Program were between NPS 4 and NPS 12. Ground subsidence is predicted to be negligible where these pipelines are abandoned in-place due to their small diameter.

Catastrophic pipe collapse is not expected as any potential corrosion locations would likely be at limited locations along the pipelines and to occur over long periods. Therefore, any ground subsidence is expected not to be significant and in agricultural areas it will be mitigated by routine tilling practices. Corrosion byproducts (rust) are expected to be minimal and located at pipeline depth below ground surface.

2.2 Cultivated, Non-Cultivated, and Environmentally Sensitive Areas

NGTL recognizes that some corrosion might occur over time in localized areas and may eventually create a void where subsoil material surrounding the pipeline might enter. This will be an extremely gradual process and may be difficult to perceive from surface observation as the expected localized settlement is not anticipated to be greater than 10 cm in the case of large diameter pipelines (DNV, 2015). If settling of soils occurs, settling would likely be corrected in the course of normal activities due to the small diameter of the pipelines and minor effect on surface soil expression.

2.3 Public Paved Roads and Railway Crossings

There is one paved road (Alberta Provincial Highway No. 841) and one in-active railway crossing for the 2021 Abandonment Program. To mitigate the potential for subsidence at public paved roads and railway crossings, NGTL proposes to fill the pipelines with cement to ensure structural integrity at these crossings (Wayne North Lateral). At this

time, NGTL intends to retain its crossing agreements and easements and if any subsidence is identified by the utility crossing owner or landowner, NGTL will remediate and monitor, as appropriate.

2.4 Gravel Road Crossings

There are eight gravel roads for the 2021 Abandonment Program:

- Highway 561 and Range Road 110 (Cessford East Lateral)
- Range Road 163 and 161 (Countess West Lateral)
- Township Road 280, 275 and 272, and Range Road 204A (Wayne North Lateral)

For the gravel roads crossed by the Wayne North Lateral, the pipeline section will be abandoned in-place with no special treatment. For the gravel roads crossed by the Cessford East and Countess West laterals, NGTL proposes to remove these pipelines, by pulling the pipe from either end of the road. For pipelines less than 14 inches in diameter, the risk of pipeline collapse due to roadway loads is reduced due to the small diameter of the pipe (less than 14 inches in diameter) and the depth of cover of the pipeline. Any minor subsidence will be managed by the routine road maintenance activities carried out by the responsible party.

2.5 Utility Crossings

At utility crossings, any potential long-term subsidence associated with abandoning a pipeline in-place is not expected to create risks to the utility being crossed because in most instances the utility being crossed lies below the pipeline. At this time, NGTL intends to retain its crossing agreements and easements and if any subsidence is identified by the utility crossing owner or landowner, NGTL will remediate and monitor, as appropriate.

2.6 Pipeline Segmentation and Water Conduit Effect

Over time, the abandoned sections of the pipelines may corrode and eventually result in perforations within the pipeline. These perforations could potentially create conduits which may locally divert surface water or shallow groundwater and reduce recharge to both surface water bodies and deeper groundwater resources, including associated water wells (Pipeline Abandonment Steering Committee, 1996). Conduits may also result in flooding and erosion if water subsequently exits the abandoned pipeline through additional perforations in the pipeline in lower elevation areas (Canadian Energy Pipelines Association [CEPA], 2007).

Where the pipe is removed, the water conduit effect is unlikely to occur as the soil is replaced into the pipe void. Where the pipeline is abandoned in-place, pipe segmentation is done at intervals which moderates the potential for water conduit effect. At this time, NGTL intends to retain its easements and if any subsidence or erosion is identified, NGTL will remediate and monitor, as appropriate.

2.7 Pipeline Exposure in Watercourses

Pipeline exposure may occur in watercourses as a result of scouring, slope failure or lateral movement of the channel. In the unlikely event that an exposure occurs, potential changes in local hydrology and associated sediment transport as a result of exposure may affect downstream fish communities and habitat. Pipeline exposure in watercourses may also affect navigation and navigation safety. Should a pipeline be identified as exposed in a watercourse, NGTL would evaluate the crossing to ensure that there is no threat to the environment or to public safety.

If the evaluation does not identify threats to the environment or to public safety, no actions will be taken to the exposed pipeline. The evaluation would also consider the potential of changing conditions that could lead to a threat to the environment or public safety. In such case NGTL would monitor the crossing of the exposed pipeline. Depending on a number of factors including the location of the watercourse crossing and the visibility of the exposure, the exposed pipeline would be monitored by aerial surveillance, ground surveillance, or both.

If the evaluation does identify potential effects to the environment or to public safety, the mitigation measures to mitigate the effect caused by exposure in a watercourse, that could be implemented on an abandoned in-place pipeline include either armoring the exposed pipeline or pipeline removal.

2.8 Frost Heave

Frost heave is a consideration for pipeline design and operation in Alberta where the top 120 cm of soil typically freezes in winter (Stantec, 2014). Frost heave has potential to increase uplift on an abandoned pipeline due to the reduction of heat of the surrounding soil compared with operating pipelines (CH2M HILL Energy Canada Ltd., 2014). The risk posed by frost heave is influenced by depth of cover of the abandoned pipeline as well as the length of pipeline abandoned in-place, soil type, and soil moisture (Stantec, 2014). Frost heave is most likely to affect short sections of pipeline that are abandoned in-place. Where longer sections are abandoned, the pipeline may be better anchored and will be less affected by frost heave (Stantec, 2014). Though frost heave is a documented potential concern, pipeline exposures as a result of frost heave are not frequently reported in literature (Stantec, 2014). Any pipeline exposure caused by frost heave will be resolved upon discovery as discussed in section 2.7.

2.9 Soil Erosion Effects

Soil erosion as a result of wind or water flow or by mass movement events, may reduce depth of cover and may also cause the abandoned pipeline to become exposed. Future land use, such as agriculture and industrial or residential development may be affected by exposure or inadequate depth of cover (e.g., for the installation of foundations, sub-drains or deep ploughing [CEPA, 2007]).

Soil erosion effects may occur given weather events and natural changes to the flow regime of a watercourse or surface drainage over years of flow or surficial run-off. As these events are not predictable, additional mitigation is not suggested. Any pipeline exposures caused by changes in watercourses, soil erosion or slope instability will be resolved upon discovery (see section 2.7 Pipeline Exposure for further details).

2.10 Crossings and Development

Any future crossing or development requests will be managed by NGTL's crossing and land development administration.

2.11 Unauthorized Encroachments

For facilities abandoned in-place, any unauthorized encroachments will be investigated as part of TC Energy's Damage Prevention Program.

2.12 Soil and Groundwater Contamination

For sections where the lateral pipeline is proposed to be abandoned in-place, pipeline isolations involve cutting, purging (emptying of service fluids and left without any internal pressure), cleaned of liquid or debris, and capping, as per CSA Z662. This cleaning and capping procedure effectively minimizes the potential for mobilizing residual contamination in soil and groundwater. As a result, abandoned in-place pipelines are not considered to represent a future risk to landowners and land users.

3.0 PROCEDURES FOR THE IDENTIFICATION AND ANALYSIS OF HAZARDS

3.1 Identification of Hazards

NGTL continues to be liable and responsible for possible hazards that may arise as a result of Abandonment Activities. These possible hazards include but are not limited to issues such as exposed pipe, potential subsidence due to pipe collapse and/or abnormal erosion along the right-of-way (ROW), possible water conduit effects and sites of potential contamination within the ROW as a result of pipe corrosion and/or degradation. None of these potential hazards are anticipated to occur in a manner that would result in these identified hazards posing any risk however, NGTL will continue to monitor for these potential hazards through normal operating procedures (~~including for example,~~ helicopter fly-overs and/or periodic ground-based inspections of neighboring operational ROWs) and reclamation monitoring activities following the completion of the physical Abandonment Activities.

NGTL will also conduct passive monitoring activities that include installing signage along the ROW which indicates the presence of a pipeline which has been abandoned and contact information should members of the public and/or landowners identify potential hazards along the ROW. NGTL commits to investigate all concerns received and will mitigate any potential hazards identified, as required.

3.2 Analysis of Hazards

Once a hazard has been confirmed, NGTL will reference the following procedures:

1. Determine if the hazard presents an immediate risk to the environment, the public/landowners and/or to adjacent infrastructure in the immediate area. If the hazard is determined to be an immediate risk then NGTL may implement the-TC Energy's Corporate Emergency Response Plan as required.
2. Conduct an initial analysis to understand the nature and/or extent of the hazard (i.e. geotechnical, environmental, contamination, or hydrological).
3. If required, report the hazard to the CER, as per the CER Event Reporting Guidelines (2020). NGTL will then also report the hazard to any potentially-affected landowners, stakeholders and/or Indigenous groups.
4. Identify and contact the appropriate stakeholders (both internal and external as required) to help respond to the hazard.
5. Complete a hazard inquiry to identify the root causes and determination of the appropriate hazard mitigation strategy required.
6. If hazard mitigation is required, implement the appropriate hazard mitigation strategy identified under step 5.
7. Complete remediation and reclamation activities, as required.
8. Identification of the hazard mitigation activity location for additional monitoring and reporting, as required.
9. Evaluate, adjust and implement the Abandonment Monitoring Schedule (Table 2), as required.

Any hazards identified, the subsequent mitigation activities completed, and the ongoing monitoring status of the hazard location as required

4.0 ENGAGEMENT

4.1 Engagement Plan

If a potential hazard has been confirmed, NGTL commits to notify all affected landowners, stakeholders and Aboriginal groups. If any of these groups are directly affected by a hazard, NGTL commits to engage that group when determining the appropriate mitigation. The criteria for notifying and engaging these groups is provided in Table 1. In this case NGTL has differentiated its notification/engagement criteria based on whether the hazard is localized (i.e., confined to a discrete location) or wide-spread (i.e., the hazard is spread over a large area and/or has the potential to spread).

Table 1: Notification and Engagement Criteria

Group	Hazard Type	Criteria for Notification	Criteria for Engagement
Landowners	Localized	Hazard is located on a landowner's property.	Hazard is located on a landowner's property.
	Wide-spread	Hazard is located on a landowner's property, adjacent to a landowner's property, or as defined by the TC Energy's Corporate Emergency Response Plan (ERP).	Hazard is located on a landowner's property or when the mitigation has the potential to affect a landowner's property.
Aboriginal Groups	Localized	Hazard is located on Crown land within a group's traditional territory.	Hazard is located on Crown land within a group's traditional territory and has a potential to affect traditional land and resource use activities.
	Wide-spread	Hazard is located within a group's traditional territory.	Hazard is located within a group's traditional territory and has a potential to affect traditional land and resource use activities.
County or Municipal Governments	Localized	Hazard is located within county or municipality.	As required by the TC Energy's Corporate ERP.
	Wide-spread	Hazard is located within or adjacent to the county or municipality.	As required by the TC Energy's Corporate ERP.
Provincial Environmental Regulators	Localized	As required by legislation and/or regulation.	As required by legislation and/or regulation. As required by the Project Environmental Protection Plan (EPP) commitments or unforeseen environmental issues which arise during physical Abandonment Activities.
	Wide-spread	As required by legislation and/or regulation.	As required by legislation and/or regulation. As required by EPP commitments or unforeseen environmental issues which arise during physical Abandonment Activities.
Land Users	Localized	If identified as being affected.	If identified as being directly affected.
	Wide-spread	If identified as being affected.	If identified as being directly affected.

5.0 ABANDONMENT MONITORING SCHEDULE

A general schedule of NGTL’s monitoring activities can be found in Table 2.

Table 2: Monitoring Schedule

Activity	Scope	Frequency
Aerial Inspections	Inspection of the ROW for the abandoned pipeline.	Completed Annually. <u>As required, the frequency of inspection will be confirmed once an area of concern has been identified and verified.</u> Depending on the findings, the frequency may be adjusted in the updated plan every 10 years.
Reclamation Monitoring	Ground assessment of portions of the ROW that are subject to monitoring.	Reclamation monitoring will be completed at the frequency identified in the Order. First-year reclamation monitoring will assess the entire line to determine where equivalent land capability has been met. Future monitoring will focus on areas identified as not meeting equivalent land capability during the first-year assessment. Once equivalent land capability has been achieved on the ROW, additional monitoring will no longer be required on those respective portions of the ROW.
Monitoring of areas of concern.	Ground based inspection of locations along the pipeline ROW where potential areas of concern have been identified.	As required, the frequency of inspection will be confirmed once an area of concern has been identified and verified.
Responses to public complaints.	Inspection of locations along the ROW identified by stakeholders, as having active hazards associated with them.	Completed when identified to NGTL.

6.0 HAZARD INTERNAL RECORDING PROCEDURE

Unexpected events associated with the Project will be managed through TC Energy’s Incident Management Program, which provides a systematic and timely process for anticipating, preventing and managing unplanned or unforeseen events on all TC Energy assets. All events will be captured through TC Energy’s Environmental Health Safety Management (EHSM) electronic database tool.

7.0 POST-ABANDONMENT LAND ISSUES

Following the abandonment of facilities, existing or potential contamination will have been investigated further, identified contamination will have been remediated, and lands will have been reclaimed to equivalent land capability. As such, it is not anticipated that subsequent land issues related to remediation or reclamation will arise. At this time, NGTL plans to retain its lease, dispositions and/or easements. Should NGTL decide to surrender its land rights in the future, changes in occupancy or land use could result in issues unrelated to previous NGTL activities.

In the event that land issues are identified that may be related to remediation or reclamation, NGTL will work with stakeholders and the CER, as needed, to appropriately respond. This may include further investigating the nature of the issue, determining responsibility, and implementing measures, as required, to meet the remediation and reclamation objectives for the Project.

8.0 RECORDS

As-built drawings will be retained by NGTL for the facilities that are removed or abandoned in-place as a result of the Project. If issues associated with the abandoned in-place pipeline are identified in the future, NGTL will work with stakeholders and the CER, as needed, to appropriately respond to those issues.

REFERENCES

- CEPA (Canadian Energy Pipeline Associations). 2007. Pipeline Abandonment Assumptions: Technical and environmental considerations for development of pipeline abandonment strategies. Prepared for the Terminal Negative Salvage Task Force of the Canadian Energy Pipeline Association.
- CH2M (CH2M HILL Energy Canada, Ltd.) 2014. Environmental and Socio-Economic Assessment for the Enbridge Pipelines Inc. Line 3 Replacement Program. Prepared for Enbridge Pipelines Inc. Calgary, AB.
- DNV (Det Norske Veritas™). 2015. *Understanding the Mechanisms of Corrosion and their Effects on Abandoned Pipelines Final Report*. Prepared for the Petroleum Technology Alliance of Canada. Available at: <https://www.ptac.org/wp-content/uploads/2016/08/DNV-Final-Report-PTAC-PARSC-001-Rev1-PP079627-March-3-2015.pdf>. Accessed: August 2016.
- PASC (Pipeline Abandonment Steering Committee). 1996. *Pipeline Abandonment: A Discussion Paper on Technical and Environmental Issues*. Prepared for PASC by: Canadian Association of Petroleum Producers, Canadian Energy Pipeline Association, Alberta Energy Utilities Board and the National Energy Board. Available at: <https://www.cer-rec-gc-ca/en/applications-hearings/pipelines->

abandonment/pipeline-abandonment-discussion-paper-technical-environmental-issues.html. Accessed: August 2016.

Stantec (Stantec Consulting Ltd.) 2014. A Study of Frost Heave-related Exposure Risk to Abandoned Transmission Pipelines in Cropland Areas of Southern Canada. Prepared for: Petroleum Technology Alliance Canada. Available at:
http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjulsnRsrjOAhUfKWMKHZm0AjYQFggdMAA&url=http%3A%2F%2Fwww.ptac.org%2Fattachme%2F1693%2Fdownload&usg=AFQjCNE-qygQnscQ3ZdgEKLC_JutBSTVDw