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January 31, 2016

Filed Electronically
Original by Courier

Ms. Sheri Young
Secretary of the Board
National Energy Board
517 – 10th Avenue S.W.
Calgary, AB T2R 0A7

Re: Westcoast Energy Inc., carrying on business as Spectra Energy Transmission ("Westcoast")
Transmission North 2012 Expansion Project
Order XG-W102-005-2012, Condition 7
Third Year Post Construction Environmental Monitoring Report
National Energy Board File: OF-Fac-Gas-W102-2011-05 01

Dear Ms. Young:

Enclosed for filing with the National Energy Board pursuant to condition 7 of Order XG-W102-005-2012 is Westcoast's Third Year Post Construction Environmental Monitoring Report for the Transmission North 2012 Expansion Project.

Any questions with respect to this filing should be directed to Matthew Mosher, Coordinator, Regulatory Facilities at (403) 699-1589.

Yours truly,

Original signed by

Rachel Kolber

Enclosure

**THIRD YEAR POST-CONSTRUCTION ENVIRONMENTAL
MONITORING REPORT
FOR THE
WESTCOAST ENERGY INC.
T-NORTH 2012 EXPANSION PROJECT**

January 2016

Prepared for:



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1.0 INTRODUCTION AND PROJECT DESCRIPTION

In March 2012, Westcoast Energy Inc., carrying on business as Spectra Energy Transmission (Westcoast), received National Energy Board (NEB) Order XG-W102-005-2012 pursuant to section 58 of the *National Energy Board Act* approving construction of the Transmission North 2012 Expansion Project (Project). This third year post-construction environmental monitoring (PCEM) report addresses the Project and has been prepared to meet the requirements of condition 7 of Order XG-W102-005-2012.

The Project consisted of the construction of approximately 24.3 km of 1067 mm (NPS 42) O.D. pipeline approximately 77 km west of Fort St. John, British Columbia (BC) and 24 km northwest of Hudson's Hope, BC (Figure 1). The pipeline transports sweet natural gas adjacent to the existing Westcoast Fort Nelson Mainline from the N5 compressor station at c-67-I/94B1 (KP 0.0) to d-7-A/94B1 (KP 24.3), where it joins with the existing Fort Nelson Mainline.

The right-of-way is approximately 22 m wide with 15 m of temporary workspace for a total right-of-way width of 37 m. Additional temporary workspace was taken at the crossings of roads and wet areas as well as at sharp sidebends, slopes and log deck sites. The Project also included installation of a pig launching facility at the N5 compressor station. The right-of-way runs parallel to the existing Fort Nelson Mainline right-of-way for 22.9 km (94.6%) of its length. Clearing and pipeline construction activities began in August 2012 with right-of-way clean-up and reclamation completed in summer 2013.

Westcoast committed to a PCEM program to monitor the right-of-way¹ during the first and third growing seasons following the commencement of operation of the Project. Order XG-W102-005-2012, issued by the NEB on March 13, 2012, outlines the following specific requirements for PCEM:

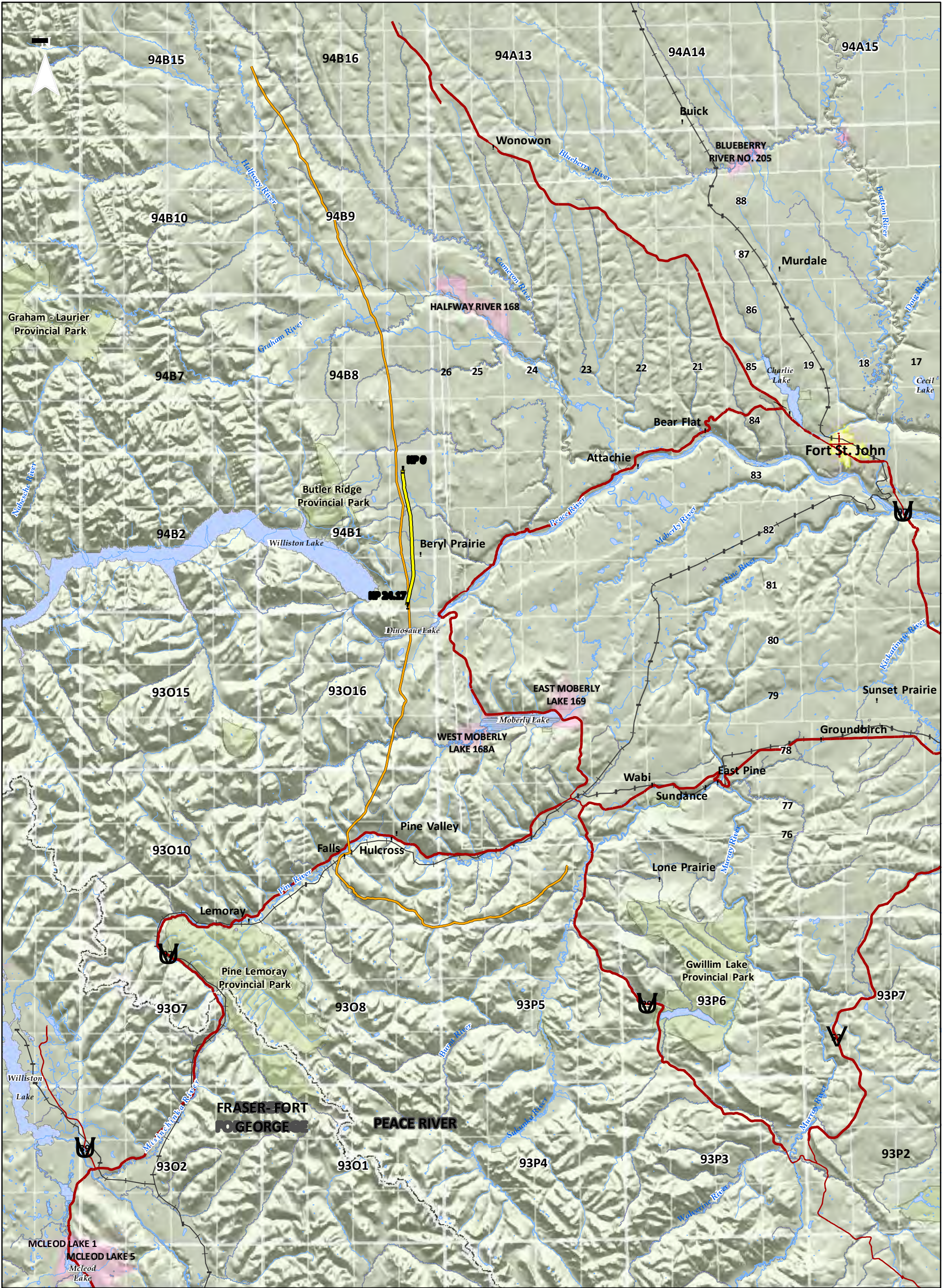
On or before 31 January after each of the first and third complete growing seasons following the commencement of operation of the Project, Westcoast must file with the Board a post-construction environmental monitoring report that includes, but is not limited to, the following:

- a. a description of the criteria established for evaluating success of the mitigation measures for the Project;*
- b. a description of the methodology used for monitoring and the results found;*
- c. an identification of the issues to be monitored, including but not limited to unexpected issues that arose during construction, and their locations (e.g., on a map or diagram, in a table);*
- d. a description of the current status of any issues (resolved or unresolved), and a description of any deviations from plans and corrective actions undertaken;*
- e. an assessment of the effectiveness of mitigation (planned and corrective) measures applied against the criteria for success described in a);*
- f. details of consultation undertaken with appropriate provincial and federal authorities; and*
- g. proposed mitigation measures to address any unresolved issues, and the schedule that Westcoast would implement to address ongoing issues.*

This report presents the results of the third year PCEM program conducted during the summer and fall of 2015. Issues identified during the ground reconnaissance and mitigative actions recommended and completed are documented in the 2015 PCEM Environmental Issues List (Table 1).

Please note that relevant information from the first year PCEM report, completed by TERA Environmental Consultants (TERA) and filed with the NEB in January 2014, has been incorporated into this report and that the PCEM assessment criteria and methods have remained consistent.

¹ Both the right-of-way and temporary work space areas are assessed under the Westcoast PCEM program. For simplicity, unless the context requires otherwise, references in this report to "right-of-way" are intended to include both the Pipeline right-of-way and the temporary work space areas used during construction.



!

Kilometre Post

Westcoast Loop

Existing Westcoast Pipeline

Highway

Road

City/Town

Indian Reserve

Park or Protected Area

Spectra Energy

SCALE: 1: 650,000

0 2 4 6 8 10

km

(All Locations Approximate)

tera

ENVIRONMENTAL CONSULTANTS

NAD83 UTM Zone 10N

Hillshade: Geobase 2008; Roads: IHS Inc. 2011; Hydrology: IHS Inc. 2004; Municipal Boundaries: BC Integrated Land Management Bureau 2011; Reserves: Government of Canada 2011; Parks: BC Integrated Land Management Bureau 2008.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

FIGURE 1 REGIONAL LOCATION FIRST YEAR POST-CONSTRUCTION ENVIRONMENTAL MONITORING PROGRAM FOR THE WESTCOAST ENERGY INC. T-NORTH 2012 EXPANSION PROJECT	
January 2014	8407
Mapped By: JW	Checked By: SB

2.0 ENVIRONMENTAL SETTING

As noted in the first year PCEM report (TERA 2014), the Project is within the Peace River Basin Ecoregion of the Boreal Plains Ecozone. The ecoregion is classified as having mixed forests of trembling aspen, lodgepole pine, balsam poplar, white spruce, balsam fir and paper birch. Balsam poplar and white spruce are common on wetter sites, lodgepole pine may be present on drier sites, and black spruce is common on organic soils.

Approximately 67% of the Project is located on private lands, characterized primarily as forest and forest-pasture lands, and 33% of the Project is on Crown lands. Forest occupies about 61% of the route. Approximately 4% of the forest land is used as pasture. Most of the forest land occurs along the northern and southern portions of the route. Hay fields occupy about 23% of the route. Only about 1% of the hay fields have a poorly developed sod layer. Tame pasture constitutes about 12% of the route and the remaining 4% consists of cultivated land.

The Project lies within the Great Plains Physiographic Region of BC, where terrain is characterized by flat, gently dipping shales and sandstones. Surfaces are generally flat to moderately sloping, with some discreet locations of steep slopes. Soils vary in composition from the north to south end of the Project. Sections of the first 6 km of the right-of-way encounter organic soils, the central section of the right-of-way is dominated by brunisolic gray Luvisol soils, and the last 4 km of the right-of-way encounters eluviated eutric Brunisol soils.

There are eight watercourses crossed by the Project. The right-of-way crosses Brenot, Mackie, Lynx and Portage creeks as well as two unnamed tributaries to Mackie Creek, an unnamed tributary to Lynx Creek and an unnamed tributary to Portage Creek. Appendix A provides information regarding each of the watercourses crossed by the Project.

3.0 MONITORING PROGRAMS

A number of environmental monitoring procedures have been implemented by Westcoast with the objectives of identifying potential environmental issues prior to, during and after the construction phase (including the period of PCEM) as well as recommending, where warranted, corrective measures to address any outstanding environmental effects. These procedures include: environmental monitoring during construction and the development of an environmental issues list; frequent line patrols once the pipeline is in operation; implementation of a PCEM program; and monitoring of the right-of-way by Westcoast Operations personnel during and following the completion of the PCEM program.

3.1 Construction Monitoring

Sensitive environmental features were monitored during construction to ensure that the appropriate environmental protection measures were implemented and that the protection measures were effective in reducing environmental effects. An Environmental Inspector was assigned to the construction program to monitor all phases of construction and track identified environmental issues, with particular emphasis on environmental features and construction activities, which were considered to have the greatest potential for environmental effects.

3.2 First Year Post-Construction Environmental Monitoring

The first year of the PCEM program was conducted during the summer of 2013 to examine any unresolved environmental issues identified within the environmental issues list and to identify any new issues related to reclamation. The purpose of the PCEM program was to:

- evaluate the recovery of areas disturbed during pipeline construction;
- assess the status of outstanding environmental issues identified in the environmental issues list provided by the Environmental Inspector;
- visually inspect the right-of-way through ground reconnaissance for any new or previously unidentified environmental issues;
- recommend corrective measures to be implemented to address outstanding environmental issues in a timely manner; and
- update the environmental issues list upon completion of the summer 2013 ground reconnaissance, to become the starting point for the third year PCEM program in 2015.

A ground reconnaissance of the right-of-way was conducted by TERA in late-August and mid-September 2013. First year PCEM reporting requirements were also completed by TERA for the Project (TERA 2014).

3.3 National Energy Board Inspection

On 8 October 2013, the NEB conducted an inspection of Westcoast's rights-of-way and associated facilities near Hudson's Hope BC in the vicinity of the Project. The inspection was undertaken to verify compliance with the *National Energy Board Onshore Pipeline Regulations* (OPR), the *Canadian Standards Association Standard for Oil and Gas Pipeline Systems* (CSA-Z662-11), and previously issued certificates and/or orders associated with the facilities inspected (GC-23, GC-42, and XG-W102-005-2012).

The inspection also included verifying compliance with Westcoast's program manuals such as the *Environmental Manual For Construction Projects In Canada 2nd Edition* – May 2010, the T-North 2012 Project Environmental Protection Plan, and company commitments associated with the Project under Condition 3 of Order XG-W102-005-2012.

The results of the inspection (see Appendix B - 1314-166 NEB Inspection Report) verified no concerns with the post-construction reclamation of the Project right-of-way or temporary work space. No non-compliances were identified. NEB Inspection staff were satisfied with the quality of the final clean-up and reclamation activities observed during the inspection of the Project right-of-way.

3.4 Year 3 Post-Construction Environmental Monitoring

The third year of the PCEM program was conducted during the summer and fall of 2015. The purpose of the third year PCEM program was to:

- evaluate the continued recovery of areas disturbed during pipeline construction;
- assess the status of outstanding environmental issues identified in the first year PCEM report;
- visually inspect the right-of-way through ground reconnaissance for any new or previously unidentified environmental issues;
- recommend and/or complete corrective measures to address outstanding environmental issues identified; and
- update the 2013 environmental issues list upon completion of the 2015 ground reconnaissance, including corrective actions required and the status of noted actions.

A proactive and systematic approach was employed to complete the third year of the PCEM program.

1. The first step was to conduct a detailed ground inspection of the right-of-way and temporary work spaces. This field work took place on July 1 to 3, 2015. Prior to conducting the inspection, communications and notifications were completed with landowners and landowner feedback was noted for follow-up as well as items noted in the 2013 environmental issues list.
2. The findings of the detailed ground inspection were then summarized and a work plan was documented to address outstanding concerns. Based on the work plan, a contractor was selected and a work schedule finalized.
3. The work to complete the corrective actions began on September 3 and was completed prior to freeze up on October 24, 2015.
4. The final field assessments were then completed and relevant data was documented in the 2015 PCEM Environmental Issues List (Table 1).

4.0 POST-CONSTRUCTION ENVIRONMENTAL MONITORING METHODOLOGY

The methodology for monitoring the status of environmental issues has been based on the philosophy, and with the fundamental principle, that the success of land reclamation is measured against the representative conditions located adjacent to the right-of-way, with due consideration for the construction norms at the time of the assessment. Where no known limitations to normal management and ecosystem function for that land type are evident during the PCEM program, mitigation measures were determined to be effective and the environmental issue resolved. The PCEM program was conducted using a methodology that has been utilized in numerous PCEM reports previously submitted by Westcoast to the NEB, including the first year PCEM report filed with the NEB in January 2014 for the Project.

4.1 Preliminary Work

Preliminary work included a review of the first year (2013) PCEM Environmental Issues List (TERA 2014) and determination of current landowner concerns. A Land Agent from Westcoast contacted current landowners to review concerns and discuss access. One landowner noted a potential of minor subsidence at a road crossing. Otherwise there were no other landowner concerns noted at that time. Consultation with provincial or federal government agencies was deemed to be not required due to the nature and extent of the work completed.

4.2 Ground Reconnaissance

Ground reconnaissance to monitor the level of reclamation success was conducted throughout the various tasks that took place during the months of July, September and October 2015. A detailed inspection of reclamation success was completed for soil, landscape, vegetation and watercourse environmental features along all segments of the right-of-way. The following describes the components of the ground reconnaissance.

4.2.1 Data Collection

The 2015 ground inspection was conducted to identify visible anomalies to vegetation, soil stability (erosion), riparian zones, surface contours and drainage conditions as well as observations to identify significant change in plant community, land ownership or land management, or where the 2013 environmental issues list indicated that there was an environmental issue.

Assessment of all noted anomalies included comparisons between the present conditions on the right-of-way to the undisturbed condition off the right-of-way, and comparisons on the right-of-way adjacent to the noted anomaly. Where vegetation cover on the right-of-way will be managed differently than the plant community located adjacent to the right-of-way (e.g., forest vegetation), right-of-way vegetation cover was compared against a similar plant community located as close to the right-of-way as possible, and to site requirements (e.g. erosion control).

4.2.2 Soil Assessment

TERA evaluated soils for compaction, topsoil depth, admixing of topsoil/strippings with subsoils and soil stability (erosion) during the first year of the PCEM program (summer 2013). This detailed information was included in the January 2014 PCEM report filed with the NEB. Since no construction equipment has operated on the right-of-way since construction was completed, assessment factors relating to construction compaction, topsoil depth and admixing of topsoil/strippings with subsoils were not re-assessed at this time (no significant change could be expected).

Soil erosion and soil productivity (vegetative establishment and growth) were included in the 2015 PCEM inspections and assessment.

4.2.3 *Landscape Assessment*

The landscape assessment completed by TERA and documented in the first year PCEM report included coarse fragments, contour and drainage re-establishment, and micro-topography. Again, since no construction equipment has operated on the right-of-way since construction was completed, construction assessment factors relating to coarse fragments, contour re-establishment and micro-topography were not re-assessed at this time (no significant change could be expected).

Surface factors relating to drainage (including damming, ponding and extended periods of soil saturation) were included in the 2015 PCEM inspections and assessment.

4.2.4 *Vegetation Monitoring*

Vegetation establishment on the right-of-way (agricultural and forested lands) was visually assessed. The occurrence and types of undesirable species (e.g. weeds) was also noted.

The right-of-way was inspected for vegetation issues such as poor crop performance or ground cover establishment. Vegetation parameters that were assessed during the growing season, and prior to crop harvest on agricultural lands include:

- crop density, height, vigour, distribution and colour;
- bare soil exposure, visible erosion, surface litter, grazing pressure and plant vigour on tame pasture and hay lands; and
- weed species and densities present on all land uses.

On agricultural lands, the PCEM inspection was conducted prior to harvest when vegetation growth was sufficient for species identification and evaluation. Where visual differences were observed between on and off the right-of-way, plant growth parameters such as height, density and vigour on the right-of-way were qualitatively and, where appropriate, quantitatively compared to the adjacent vegetation off the right-of-way. If vegetation on the right-of-way had not been seeded prior to vegetation monitoring, soil assessments were conducted. Vegetation observations were conducted along the entire right-of-way including areas with moderate to steep slopes, areas that may be prone to erosion, and the banks and approach slopes of watercourses.

4.2.5 *Watercourse Monitoring*

The banks, riparian zones and approach slopes of watercourses were monitored for terrain stability, morphology, erosion, invasive species, revegetation and the effectiveness of short (e.g., erosion control blanket) and long-term (e.g., diversion berms) erosion control measures. The right-of-way was also monitored to determine if there was any disruption of natural drainage patterns. Appendix A details pertinent information about each of the eight watercourses crossed by the Project.

5.0 RESULTS / OBSERVATIONS

All areas and features on the right-of-way and associated temporary work spaces were available for observation and assessment in 2015. In general, many of the environmental issues observed were the result of livestock and/or landowner impacts. It should be noted that all environmental issues identified have been addressed and resolved, regardless of the root causes. No deviations from plans or corrective actions were undertaken.

The results of the third year PCEM program inspections and assessments are documented in section 5.1, Table 1 (2015 PCEM Environmental Issues List). Table 1 includes specific information regarding i) issues identified, ii) observations noted, iii) corrective actions recommended and iv) the status of corrective actions.

Section 5.2 includes photos of corrective actions that were taken in 2015 to resolve environmental issues. These photos are referenced in Table 1 and have been provided as examples of the type of work that was completed to address environmental issues and landowner concerns.

Table 2 (2013 PCEM Environmental Issues List Summary Table) in section 5.3 contains a summary of the first year PCEM assessment issues and the 2015 assessment comments regarding each of these issues (as listed in the last column). Issues that required corrective actions were included in Table 1, and have been addressed.

Section 5.4 includes photos of areas of concern that had been included in the first year PCEM report and photos of the same (or very close) areas as observed in 2015. These photos are referenced in Table 2 and have been provided as examples of the extensive vegetative growth that has established along most of the right-of-way.

The final pictorial information that is available for review includes photos of the Project right-of-way. Throughout the various stages of inspection, corrective action implementation and final assessments, line photos were taken at 500 m intervals (looking both north and south) for the entire length of the right-of-way. These photos can be found in Appendix C.

5.1 Table 1. 2015 PCEM ENVIRONMENTAL ISSUES LIST

Location (KP)	Land Use	Issue(s)	Observations Noted	Corrective Actions Recommended	Status
KP 0.000 to KP 0.240	Forested	No issues observed	Vegetative cover is established through this section and no other concerns were noted.	No action required	Resolved
KP 0.240 to KP 0.320	Forested	Vegetation	Vegetative cover was not at standard on the right-of-way (ROW) or in the temporary work space (TWS) at this location.	Harrow, seed and fertilize (Photo 1 in Section 5.2)	Resolved
KP 0.320 to KP 1.775	Forested	No issues	There is subsidence along a third party pipeline and at the pipeline crossing at KP 0.035 (not Westcoast related). Armoring, bed and banks are stable on the two unnamed tributaries to Mackie Creek at KP 1.010 and KP 1.130, and the riparian zones are vegetated.	No action required other than notifying third party pipeline owner of subsidence concerns	Resolved
KP 1.775 to KP 1.925	Forested	Vegetation	There were several patches along the sidehill where vegetative cover was less than required.	Hand rake, seed and fertilize	Resolved
KP 1.925 to KP 2.570	Forested	No issues observed	Vegetative cover is well established throughout this section and no other concerns were noted.	No action required	Resolved
KP 2.570	Forested	Subsidence	Minor subsidence over the bellhole above the road ditch on the landowner gravel pit road.	Fill, pack, seed and fertilize minor area of subsidence (Photo 2 in Section 5.2)	Resolved
KP 2.570 to KP 3.602	Forested	No issues observed	Armoring, bed and banks are stable on Mackie Creek at KP 3.320 (where disturbance took place) and the riparian zone is well vegetated. Survival of the planted stock (e.g. willow and spruce) is low due to the extensive vegetative cover and associated competition.	No action required	Resolved
KP 3.602 to KP 4.050	Hay	Soil Management / Vegetation	The landowner was responsible for seeding. Seeding did not occur and as a result there has been minor rill erosion and volunteer vegetative growth. Coverage is adequate although not the preferred species for the landowner. As a result the landowner plans to cultivate and seed in the coming year.	No action required	Resolved
KP 4.050 to KP 4.070	Road Allowance	Erosion	Adjacent pipeline cleanup and landowner activity did not tie surface flows into the established drainage across the ROW causing erosion channeling adjacent to the drainage.	Repair erosion gullies, reshape and armor drainage, install topsoil adjacent to the drainage, install erosion control matting, in the drainage, seed and fertilize (Photo 3 in Section 5.2)	Resolved
KP 4.070 to KP 5.300	Pasture/ Forested	Erosion	Landowner seeding was completed and has established. The drainage / wet site between KP 4.646 and KP 4.749 has stabilized and is well vegetated. There were three locations across this quarter with rill or minor gully erosion on the ROW. Although the landowner was not concerned the sites were repaired to avoid further issues.	Repair erosion, seed and fertilize	Resolved
KP 5.300 to KP 7.350	Pasture/ Forested	No issues observed	Vegetative cover is well established throughout this section and no other concerns were noted.	No action required	Resolved

Location (KP)	Land Use	Issue(s)	Observations Noted	Corrective Actions Recommended	Status
KP 7.350 TO KP 7.730	Lynx Creek	No issues observed	Armoring, bed, flood channel and banks are stable on Lynx Creek at KP 7.520. The riparian zone is well vegetated and the surface breakers are stable and functioning as required. Survival of the planted stock (e.g. willow and spruce, etc.) is adequate considering the extensive vegetative cover.	No action required	Resolved
KP 7.730 to KP 8.150	Forested	Vegetation	The new landowner has decided to hay the ROW through this previously forested area. Vegetation establishment is progressing well however less than optimal for the production of hay. The landowner requested further work be completed to enhance vegetative cover. It should also be noted that due to the cutting of hay all planted tree stock above the break in slope south of Lynx Creek has now been removed.	Over seed with a pasture mix (as per specific landowner request) and fertilize. Also landowner caused rutting was corrected above the break in slope at Lynx Creek to eliminate water channeling and the potential for erosion (Photo 4 in Section 5.2).	Resolved
KP 8.150 to KP 8.230	Watercourse	No issues observed	Surface breakers, bed and banks are stable on the unnamed tributary to Lynx Creek at KP 8.190. The riparian zone is vegetated. Beavers continue to install dams downstream of the ROW causing standing water on a portion of the ROW at times.	No action required	Resolved
KP 8.230 to KP 9.050	Cultivated	No issues observed	This land is currently being used for pasture and hay production. Vegetative cover is well established throughout this section and no other concerns were noted.	No action required	Resolved
KP 9.050 to KP 9.150	Cultivated	Vegetation	Livestock herding adjacent to the gates and road on both the north and south sides of the road has caused soil compaction, minor water ponding and lack of vegetative cover.	Re-establish and improve grade, install topsoil, track pack and seed (Photos 5 and 6 in Section 5.2).	Resolved
KP 9.150 to KP 12.310	Cultivated / Pasture	No issues observed	This land is currently being used for pasture and hay production. Vegetative cover is well established and no other concerns were observed on this ranch.	No action required	Resolved
KP 12.310 to KP 12.690	Pasture	No issues observed	This land is currently being used for pasture. Vegetative cover is established and no other concerns were noted.	No action required	Resolved
KP 12.690 to KP 12.775	Riparian Zone	Compaction / Vegetation	The adjacent rancher (with the landowner's permission) fenced the ROW down the north slope of Brenot Creek to the water. Five hundred yearling heifers were then allowed to graze the area and access the creek for water for over a month in the spring. The extensive vegetation on this sensitive site was grazed to the roots, one surface breaker was damaged and surface depressions were caused in two other locations on the lower slope. Significant compaction was caused on the entire slope.	Install topsoil at the damaged surface breaker and in the two surface depressions, pack topsoil, seed and rake (Photo 7 in Section 5.2). Remove displaced erosion control mat from the other surface breakers (to minimize more of it getting torn up). Over-seed the entire north slope riparian zone with a pasture mix. Note that no effort was made to de-compact soils as the landowner and rancher plan to use the area again in the spring for cattle (currently there are a small herd of horses). Further surface disturbance at this time would provide the opportunity for considerably more damage or slope instability if this land use practice continues.	Resolved

Location (KP)	Land Use	Issue(s)	Observations Noted	Corrective Actions Recommended	Status
KP 12.775 to KP 13.110	Forested / Pasture	No issues observed	Armoring, bed and banks are stable on Brenot Creek at KP 12.780. The riparian zone is well vegetated (on the south slope) and the surface breakers are stable and functioning as required. Survival of the planted stock (e.g. willow and spruce, etc.) has suffered considerable livestock damage and competition from extensive vegetative cover. The fence at the top of the bank is down due to a buffalo herd breakout. Vegetative cover is well established and no other concerns were noted on the property.	No action required	Resolved
KP 13.110 to KP 13.920	Cultivated	No issues observed	Crop density and vigor as well as plant color was very good across this quarter. No other concerns were noted.	No action required	Complete
KP 13.920 to KP 14.850	Pasture / Forested	Compaction / Vegetation	Intensive livestock use has caused considerable compaction and notable lack of vegetation through much of this area. The landowner has not seeded as committed. The exception is the coulee which is stable and well vegetated (the coulee had been re-seeded by the contractor during clean-up).	We worked with the landowner to resolve this issue. The landowner was responsive and disked the entire area that had been impacted by livestock including the ROW (Photo 8 in Section 5.2). We then supplied the landowner with an appropriate pasture seed mix and fertilizer, and the landowner seeded and fertilized (as well as moved a cattle feeder and waterer off of the ROW). The landowner had very poor success with seeding several areas on his property and had many questions and was very appreciative of the suggestions and provision of appropriate quality seed and direction for the ROW.	Resolved
KP 14.850 to KP 16.340	Forested / Pasture	No issues observed	Crop density and vigor as well as plant color (on all newly cultivated areas) was very good across the remainder of this property. No other concerns were noted.	No action required	Resolved
KP 16.340 to KP 17.895	Forested / Cultivated	No issues observed	The entire area is now under cultivation. Crop density and vigor were good (considering the transition from forest land). The landowner did ask us to fill in around two posts just off and to the side of the ROW.	Added topsoil, packed and seeded minor subsidence at two locations just west of the T-North 2012 Project ROW as per the landowners request (Photo 9 in Section 5.2). Otherwise, no action required.	Resolved
KP 17.895 to KP 17.950	Forested	Erosion	The bed and banks are stable on Portage Creek at KP 17.960. The riparian zone is vegetated and the surface breakers are stable and functioning as required. The planted willows are doing well although the landowner has been removing them to avoid interference with landowner's horses. Minor rutting on the upper slope (caused by third party workers) between the access road and the surface breaker had resulted in the development of several erosion gullies.	Shape up and compact the erosion gullies. Fill the erosion gullies with shale material and compact (Photo 10 in Section 5.2). Apply topsoil over the disturbed area, seed and track pack (Photo 11 in Section 5.2).	Resolved
KP 17.950 to KP 18.510	Cultivated	No issues observed	The entire area is now under cultivation. Crop density and vigor as well as plant color was very good and no other concerns were noted.	No action required	Resolved
KP 18.510 to 18.660	Forested	Erosion / Vegetation	The landowner had not seeded as committed. As a result vegetation establishment was poor (well below the required standard) and rill and minor gully erosion was present.	We worked with the landowner who disked and levelled the ROW to the top of the bank. We then completed seeding (a pasture mix), fertilizer application and harrowing (Photo 12 in Section 5.2).	Resolved

Location (KP)	Land Use	Issue(s)	Observations Noted	Corrective Actions Recommended	Status
KP 18.660 to KP 18.770	Forested	No issues observed	The armoring, bed and banks are stable on the tributary to Portage Creek at KP 18.680. The riparian zone is very well vegetated and the surface breakers are stable and functioning as required. The planted willows are also doing well. No other concerns were noted.	No action required	Resolved
KP 18.770 to KP 20.500	Forested	No issues	Vegetative cover is well established throughout this section and no other concerns were observed. However, it should be noted that third party and recreational vehicle users have created a trail along the west boundary of the ROW. This vehicle trail likely replaces the trail that had been present prior to construction. The trail has resulted in minimal impacts with the exception of vegetation loss in the tire tracks and minor rutting beside the one wetland (no potential for erosion or sediment transport at this location).	No action required	Resolved
KP 20.500 to KP 21.900	Forested	Vegetation	Vegetation establishment has been slowed somewhat by the drier sandy soils and impacts of recreational use (rutting and soil disturbances in the sandy soils). However, overall vegetation establishment is within acceptable standards with isolated areas requiring enhancement to speed or improve the process.	Over-seed the entire area from KP 20.500 to KP 21.900 with a pasture / forestry / nurse crop seed and fertilizer mix to provide a greater variety of species to take advantage of specific micro-sites and a nutrient boost to assist with further establishment and growth.	Resolved
KP 21.900 to KP 24.000	Forested	No issues observed	Vegetative cover has established well throughout this section, most growth is relatively well established and vigorous given the nature of the soils, and no other concerns were noted with the exception of several incidents of third party or recreation use impacts.	No action required	Resolved
KP 24.000 to KP 24.300	Forested	Erosion	Vegetative cover has established well throughout this section and again most growth is vigorous given the nature of the soils. There was one surface breaker at approximately KP 24.100 that had eroded creating a steep face and deeper than required channel.	Repair the surface breaker at KP 24.100. Round the steep downslope face to eliminate the unnecessarily high bank and use this material to fill in the deeper than required channel. Pack, seed and fertilize (erosion control mat is not required in this cobble soil).	Resolved

Notes: KPs are approximate

Weed growth has not been addressed in the above table. In general, extensive vegetative growth and landowner cultivation and cropping has controlled or eliminated many of the original weed concerns noted in the 2013 PCEM assessment. Weed picking and disposal during clean-up has also proved to have been effective. Most weeds noted during the 2015 work were either removed at the time, located on areas now under cultivation (which should help to resolve the concern) or located in pasture lands where the occurrence of weeds on the right-of-way are of lesser density as compared to the surrounding vegetation. Weeds on the Project right-of-way will be managed as part of the ongoing inspection and maintenance program for this line (as per the Westcoast Vegetation Management Standard Operating Procedure).

A status of 'Resolved' means all recommended corrective actions have been implemented and completed.

5.2 2015 Corrective Action Photos (as referenced in Table 1)



Photo 1. Ground crew using light equipment to harrow, seed and apply fertilizer at KP 0.250 (September 4, 2015).



Photo 2. Ground crew in the process of filling the minor bellhole subsidence at KP 2.570 prior to packing, seeding and applying fertilizer (October 23, 2015).



Photo 3. Repairs underway at KP 4.060 to correct drainage issues caused by recent clean-up on an adjacent line and landowner water management practices (October 23, 2015).



Photo 4. Repair of landowner caused rutting leading to the break in slope at Lynx Creek to eliminate water channeling and the potential for erosion (September 5, 2015).



Photo 5. Work completed to re-establish grade, install topsoil, track pack and seed to repair livestock damage at KP 9.050 (October 24, 2015).



Photo 6. Work completed to re-establish grade, install topsoil, track pack and seed to repair livestock damage at KP 9.150 (October 24, 2015).



Photo 7. Topsoil placed for packing and seeding to repair the surface breaker and compaction / water ponding caused by livestock overuse on the north slope of Brenot Creek at KP 12.710 (October 23, 2015).



Photo 8. Looking north from KP 14+750 at the disking and seeding completed by the landowner to address overuse by livestock and the lack of seeding after clean-up (as had been committed by the landowner) (October 24, 2015).



Photo 9. Added topsoil, packed and seeded minor subsidence just west of the T-North 2012 ROW as per the landowners request (October 22, 2015)..



Photo 10. Topsoil was stripped and the erosion gullies on the slope at KP 17.920 were filled with shale and compacted to prevent further erosion (October 22, 2015).



Photo 11. Topsoil was then replaced and seeding and track packing was completed at KP 17.920 (October 22, 2015).

Also note the landowner clearing that has taken place on the banks of Portage Creek in the area that had been purposefully left undisturbed during construction.



Photo 12. Looking south from KP 18.550 at the disking completed by the landowner and seeding completed by the contractor to address erosion and the lack of vegetation as a results of seeding not being completed by the landowner as committed (September 5, 2015)

5.3

Table 2. 2013 PCEM ASSESSMENT ENVIRONMENTAL ISSUES LIST SUMMARY TABLE

Environmental Issues	Location	Mitigative Measures and Observations in 2013	Status (2013)	2013 Recommendations	2015 Assessment Comments
1. PHYSICAL ENVIRONMENT					
(a) Coarse fragments	Entire route	<ul style="list-style-type: none"> No coarse fragment issues observed along the right-of-way in 2013. 	Resolved	None required.	No concerns noted.
(b) Contouring and drainage	Various	<ul style="list-style-type: none"> Drainage issues observed from KP 22.142 to KP 22.246, and at KP 23.160. 	Unresolved	Monitor in 2015 and, if warranted, re-contour the right-of-way as close to the pre-construction profile as possible.	<p>KP 22.142 to KP 22.246 - Minor water ponding occurs primarily in the spring (this is a naturally low lying area). The vegetative cover continues to establish and no detrimental effects should be expected, or further action required.</p> <p>KP 23.160 – Surface drainage is adequate (minor ponding may occur for short periods during very wet conditions – this area is also low lying) and vegetative cover has established. No detrimental effects should be expected, or further action required.</p>
2. SOIL AND SOIL PRODUCTIVITY					
(a) Topsoil/strippings admixing	Various	<ul style="list-style-type: none"> Surface admixing was observed at KP 3.401. Surface admixing was observed from KP 4.646 to KP 4.749, however, this coincides with the location of a pre-existing wetland so the soil differences observed may be attributed to pre-existing conditions. No vegetation was present to assess establishment. 	Unresolved	Monitor in 2015 for vegetation establishment and, if warranted, source and add clean topsoil/strippings material.	<p>KP 3.401 – Vegetative cover has established. The landowner does plan to cultivate and seed this location in conjunction with his adjacent fields.</p> <p>KP 4.646 to KP 4.749 – This is a drainage / wet site that has re-established well with suitable surface flows and vegetative cover.</p> <p>See Photo 14 and 14a in Section 5.4 regarding the admixing concerns observed in 2013 at KP 4.749.</p>
(b) Degradation of soil structure and lowering of soil productivity through compaction and rutting	Various	<ul style="list-style-type: none"> Compaction was observed from KP 3.192 to KP 3.325, 13.333 to KP 13.350, and KP 13.901 to KP 13.934. Compaction resulting from soil disturbance caused by cattle observed from KP 9.693 to KP 9.750, KP 9.861 to KP 9.914, KP 10.302 to KP 10.370, KP 10.451 to KP 10.623, and KP 10.622 to KP 10.704. Compaction resulting from third party vehicle or recreational vehicle use was observed from KP 16.331 to KP 16.362, KP 16.702 to KP 17.133, KP 17.162 to KP 17.263, and KP 23.528. 	Unresolved	Monitor in 2015 and, if warranted, alleviate compaction.	<p>See Table 1 - 2015 PCEM Environmental Issues List for comments regarding soil compaction and rutting.</p> <p>With the exception of the items noted in Table 1 all sites on the Project right-of-way are fully vegetated or under active cultivation, or under active livestock management.</p> <p>As an example the compaction observed in the 2013 field assessment from KP 3.192 to KP 3.325 was the direct result of track packing on the steep slopes at Lynx Creek to achieve adequate compaction for slope stability and the prevention of erosion. The 2015 inspection verified that these slopes are stable, no erosion has occurred and there is extensive vegetative cover throughout the riparian zone and above the breaks in slope (e.g. no concerns were noted throughout this area).</p>

Environmental Issues	Location	Mitigative Measures and Observations in 2013	Status (2013)	2013 Recommendations	2015 Assessment Comments
(c) Soil erosion	Various	<ul style="list-style-type: none"> Areas of soil erosion observed at KP 1.730, KP 2.310, KP 2.508 to KP 2.485, KP 10.376 to KP 10.620, KP 14.442 to KP 14.542, from KP 17.895 to KP 17.988, KP 21.591, KP 21.662, KP 22.001 and KP 23.736. Areas of erosion resulting from third party recreational vehicle use were observed at KP 20.484 and KP 21.722. 	Unresolved	Monitor vegetation establishment and erosion in 2015.	<p>See Table 1 - 2015 PCEM Environmental Issues List for comments regarding soil erosion.</p> <p>With the exception of the items noted in Table 1, no additional gully or channel erosion was noted on the Project right-of-way. Many of the sites noted in the 2013 assessment are now under active cultivation or fully vegetated and stabilized.</p>
(d) Trench subsidence or remnant trench crown	Entire route	<ul style="list-style-type: none"> No subsidence issues observed along the right-of-way in 2013. 	Resolved	None required.	No concerns noted.
3. WATER QUALITY AND QUANTITY					
(a) Alterations of natural flow patterns	Various	<ul style="list-style-type: none"> No issues observed at watercourse crossings. The contouring and drainage issues noted above could potentially affect natural flow patterns. A spring was discovered on southwest corner of Lynx Creek approach during construction. rip-rap was installed to extend up the approach slope that effectively stabilized slope and prevented slumping and erosion. 	Resolved	See 1.(b) Contouring and drainage.	<p>No concerns noted.</p> <p>Item 1.(b) Contouring and drainage has been addressed above.</p>
4. VEGETATION					
(a) Vegetation establishment	Various	<ul style="list-style-type: none"> Establishment issues observed on Crown land at KP 0.525, KP 1.163 to KP 1.350, and KP 1.524 to KP 1.985. Unable to adequately assess vegetation establishment on Crown land from KP 0.000 to KP 0.317 because area has not been seeded. Unable to adequately assess vegetation establishment on Crown land from KP 18.721 to KP 24.300 due to seeding in August 2013. Unable to assess vegetation establishment on private land at KP 3.044, KP 3.384 to KP 7.520, KP 8.226 to KP 12.765, and KP 12.861 to KP 17.944. Areas not seeded by landowners at the time of survey. 	Unresolved	Continue to monitor the establishment of vegetation on the right-of-way in 2015 and reseed Crown land, if warranted.	<p>See Table 1 - 2015 PCEM Environmental Issues List for comments regarding vegetation establishment.</p> <p>Note that the 2013 field assessments were conducted immediately after the clean-up was completed. As a result much of the seed had not yet germinated or become established.</p> <p>With the exception of the items noted in Table 1 all sites on the Project right-of-way are fully vegetated or under active cultivation.</p> <p>See Photos 13 / 13a, 15 / 15a, 16 / 16a, 17 / 17a, 18 / 18a and 19 / 19a in Section 5.4 regarding establishment concerns observed in 2013 at KPs 3.044, 7.037, 10.094, 17.058, 21.610 and 23.902.</p>

(b) Weed introduction and spread	Various	<ul style="list-style-type: none">• Weed issue observed on private land from KP 8.226 to KP 12.765 and KP 12.861 to KP 14.241. Areas have not yet been seeded.• Low density of Canada thistle observed from KP 9.651 to KP 10.701, and KP 16.562 to KP 17.055. All observations on private land.• Low density of wild oats observed from KP 13.162 to KP 13.350 on private land.	Unresolved	Following seeding, desirable species will likely out-compete the weeds. Continue monitoring right-of-way in 2015 for weed growth and introduction as well as weed problem areas.	<p>Weed growth was not observed to be an issue during the 2015 PCEM inspection on this line. See footnotes in Table 1 - 2015 PCEM Environmental Issues List for additional comments regarding weeds.</p> <p>Also note that extensive vegetative growth (of planted species) and landowner cultivation and cropping have controlled or eliminated many of the original weed concerns noted in 2013.</p>
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5.4 2013 and 2015 Right-Of-Way Photos (as referenced in Table 2)



Photo 13. View north along the right-of-way of limited vegetation establishment on private land at KP 3.044 (September 11, 2013).



Photo 13a. Same general view as Photo 1 showing extensive vegetation and coverage after re-treatment, the landowner had not met his commitment to seed (July 2, 2015).



Photo 14. View of right-of-way and subsoil within an area described as wet and marshy during the pre-construction survey at KP 4.749 (September 11, 2013).



Photo 14a. View of the same area as Photo 14 showing extensive vegetation and full coverage throughout the nutrient rich marshy area (July 2, 2015).



Photo 15. View north along the right-of-way of limited vegetation establishment on unseeded, private land at KP 7.037 (September 11, 2013).



Photo 15a. Same view as Photo 15 showing extensive vegetative growth and coverage with good diversity of species. This site had been seeded when Photo 15 was taken (July 2, 2015).



Photo 16. View south of the right-of-way and weeds at KP 10.094 (September 10, 2013).



Photo 16a. Same general view as Photo 16 showing extensive vegetation and coverage across the entire pasture (July 2, 2015).



Photo 17. View south of the right-of-way and rill erosion on the south approach slope to Portage Creek at KP 17.958 (August 28, 2013).



Photo 17a. Same view as Photo 17 showing extensive vegetation and full coverage on the slope which is now stabilized with little to no visible evidence of erosion (October 22, 2015).



Photo 18. View south of the right-of-way and emerging vegetation following seeding at KP 21.610 (September 9, 2013).



Photo 18a. View of the same general area as Photo 18 showing generally low vegetative cover on the sandy well drained nutrient poor soils. This issue was noted in Table 1 and corrective actions were implemented (September 3, 2015).



Photo 19. View of the right-of-way and establishing clover vegetation at KP 23.902 (**August 27, 2013**).



Photo 19a. View from the same area as Photo 19 showing good vegetation including diversity of species and coverage (**September 3, 2015**).



Photo 20. View northwest across the right-of-way and gully erosion along a diversion berm (**August 27, 2013**).



Photo 20a. Same general view as Photo 20 showing good vegetation and coverage on the slope and repairs to the diversion berm (**September 3, 2015**).

6.0 CONCLUSIONS AND RECOMMENDATIONS

The results of the 2015 PCEM program confirmed that a high level of environmental protection was achieved throughout the construction phase of the Project (as was noted in the 2013 PCEM assessment). Environmental issues noted in the 2013 PCEM environmental issues list were assessed during the 2015 field inspections, in addition to an inspection of the entire right-of-way. All observed concerns were documented and addressed through corrective measures as appropriate. All known issues have been resolved as noted in the 2015 PCEM Environmental Issues List.

7.0 COMPANY REPRESENTATIVE CONTACTS

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Appendix A

Watercourse Crossings for the T-North 2012 Project

WATERCOURSE CROSSINGS FOR THE T-NORTH 2012 PROJECT

Legal Location (W6M), UTM Location (NAD83, Zone 10)	KP (2011 Routing Information)	Watercourse Name	Watercourse Type	Fish Presence	Crossing Methodology
556617E 6230118N	1.01	Unnamed tributary for Mackie Creek	S6	Non-fish bearing	Isolated trenched pipeline crossing
556659E 6230000N	1.13	Unnamed tributary to Mackie Creek	S6	Non-fish bearing	Isolated trenched pipeline crossing
556925E 6227834N	3.32	Mackie Creek	S2	Fish bearing	Isolated trenched pipeline crossing during instream window of least risk
557948E 6223832 N	7.52	Lynx Creek	S2	Fish bearing	Isolated trenched pipeline crossing during instream window of least risk
557932E 6223199N	8.19	Unnamed tributary to Lynx Creek	S6	Non-fish bearing	Isolated trenched pipeline crossing
558221E 6218620N	12.78	Brenot Creek	S3	Fish bearing	Isolated trenched pipeline crossing during instream window of least risk
558481E 6213447N	17.96	Portage Creek	S6	Non-fish bearing	Isolated trenched pipeline crossing
558523E 6212723N	18.68	Unnamed tributary to Portage Creek	S6	Non-fish bearing	Isolated trenched pipeline crossing

Appendix B


1314-166 NEB Inspection Report



INSPECTION REPORT / RAPPORT D'INSPECTION

Activity # / Activité n°	1314-166	Date	08 October 2013
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Company / Société	Westcoast Energy Inc., carrying on business as Spectra Energy Transmission (Westcoast)
Location / Emplacement	Near Hudsons Hope, British Columbia (BC)
Facility / Installation	T-North 2012 Expansion Project
NEB Order / Ordonnance	Order XG-W102-005 -2012 Certificate of Public Convenience and Necessity – GC-23 and Certificate of Public Convenience and Necessity - GC-42

Company Representative / Représentant(e) de la société	Bruce Thomas	Project Manager	403-592-2508 (direct) 403-703-5489 (cell)
	Name / Nom	Title / Titre	Telephone / Téléphone
		Signature (Signature indicates receipt of final copy, not necessarily agreement / Le signataire accuse réception de la version définitive du document sans nécessairement être en accord avec son contenu)	
	Date		
Inspector / Inspecteur	Luc Rainville	NEB Inspection Officer / Environmental Specialist	403-299-3865
	Anna DeCarlo	Enforcement Officer	403-299-3906
	Name / Nom	Title / Titre	Telephone / Téléphone
	21 October 2013		
	Date	Signature	
	444 Seventh Avenue SW Calgary AB T2P 0X8 444, Septième Avenue S.-O., Calgary (Alberta) T2P 0X8		

National Energy Board Act / Loi sur l'Office national de l'énergie

<input checked="" type="checkbox"/>	Onshore Pipeline Regulations, Règlement sur les pipelines terrestres	<input type="checkbox"/>	Processing Plant Regulations Règlement sur les usines de traitement
<input type="checkbox"/>	Pipeline Crossing Regulations Règlement sur le croisement de pipe-lines	<input checked="" type="checkbox"/>	Order- XG-W102-005 -2012 Certificate of Public Convenience and Necessity – GC-23 Certificate of Public Convenience and Necessity – GC-42

Canada Labour Code, Part II / Code canadien du travail, partie II

<input type="checkbox"/>	Canada Occupational Health and Safety Regulations Règlement sur la sécurité et la santé au travail
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REMARKS / COMMENTAIRES :

Background

The T-North 2012 Expansion Project consists of approximately 24 km of 1,067 mm (42-inch) outside diameter pipe (T-North 2012 or the Project), located in northeastern British Columbia (BC) and is owned and operated by Westcoast Energy Inc., carrying on business as Spectra Energy Transmission (Westcoast). The Project is a looping of the existing Fort Nelson Mainline pipeline right-of-way (RoW), with minor diversions at Mackie and Lynx Creeks to optimize watercourse crossings. The construction footprint included approximately 22 m of new permanent RoW and 15 m of temporary workspace (TWS), resulting in a total combined RoW width of 37 m and additional temporary workspace, which was required at crossings, side bends, log decks and where grading was necessary. The Project runs from the existing Westcoast Compressor Station N5 (CS-N5) located in c-67-1/94-B-1 Kilometer Post (KP) 0.0 to a point along the Fort Nelson Mainline located in d-7-A/94-B-1 (KP 24.2). Modifications to CS-N5 and Compressor Station 2 were also included. KP 0.0 of the Project is located approximately 77 west of Fort St-John. The project is parallel and shares rights-of-ways (RoWs) with the Westcoast 914 mm OD (36") and 762 OD (30") Transmission Pipelines, respectively constructed and operated under the *Certificate of Public Convenience and Necessity – GC-23 (GC-23)*, constructed late 1960s, and the *Certificate of Public Convenience and Necessity GC-42 (GC-42)*, constructed early 1970s. The T-North 2012 Expansion Project was constructed and is now operated under the authority of Board Order XG-W102-005 -2012. The Project was constructed in the fall of 2012, with some machine clean up having occurred in the winter of 2012/13, and final clean-up and reclamation completed in the summer months of 2013.

Purpose

On 08 October 2013, National Energy Board (NEB or Board) Inspector (NEB IO) Luc Rainville (Environmental Specialist) and Anna DeCarlo, Senior Enforcement Officer, conducted an inspection of Westcoast RoWs and associated facilities near Hudson's Hope BC in the vicinity of and/or adjacent to the T-North 2012 Project. This inspection was undertaken to verify compliance with the *National Energy Board Onshore Pipeline Regulations (OPR)*, the requirements of the *Canadian Standards Association Standard for Oil and Gas Pipeline Systems (CSA-Z662-11)*, and any previously issued Certificates and/or Orders associated with facilities inspected (*GC-23, GC-42, and XG-W102-005-2012*). This inspection also included verifying compliance with Westcoast's program manuals such as the *Environmental Manual For Construction Project In Canada 2nd Edition* – May 2010 (EMCP), the T-North 2012 Environmental Protection Plan (EPP), and company commitments associated with the Project under Condition 3 of *Order XG-W102-005-2012*.

Scope

The scope of this inspection included facilities of Westcoast's gas transmission system in northeastern BC associated with ~24 km 42" pipeline loop (Project) associated with *Order XG-W102-005-2012* and adjacent facilities associated with *GC-23* and *GC-42*. The scope included RoWs through watercourse and road crossings, agricultural, natural/forested areas, and associated above ground facilities, as well as locations of Operations and Maintenance Activities (O&M) in recent years in this region. The primary focus of the inspection was the general condition of the RoWs post-construction from KP 0.0 to KP 24.2, as well as an environmental operational inspection of Westcoast RoWs along approximately 28 Km from Dinazor Lake to CS N5.

09 October 2013

Opening Meeting

(0800hrs) NEB IO Luc Rainville and Anna DeCarlo arrived at Highland Helicopters Airport, 6213 242 Road, Fort St. John, BC. NEB inspection staff met with Bruce Thomas, Project Manager for Westcoast responsible for the construction of the T-North 2012 Expansion Project. NEB staff also met with Sean Whitford, helicopter pilot with Highland Helicopters. During this meeting, the following was reviewed:

- the purpose and scope of the inspection;
- roles, responsibilities, and authority of an NEB IO under the *National Energy Board Act (NEBA)*;
- roles and expectations of company and Board inspection staff;
- NEB enforcement tools available for resolving non-compliance issues; and
- logistics of the inspection and areas that would be included.

IL
Inspector Initials / Initiales de l'Inspecteur

Representative Initials / Initiales du représentant

(0820hrs) Safety briefing and orientation for the helicopter provided to all inspection participants prior to departure.

(0830hrs) Departure from Highland Helicopters en-route to Hudson Hope air strip.

(0910hrs) Arrived in Hudson Hope. NEB staff met with Peter Boutilier, Lead Environmental Inspector for the Project. A summary of items from the opening meeting were discussed. P. Boutilier provided additional information on the state of the T-North 2012 RoW and confirmed that we would be able to land along the RoW at areas where further ground inspections were warranted. A safety briefing and orientation for the helicopter was provided to P. Boutilier by S. Whitford.

(0925hrs) Accompanied by Westcoast representatives, NEB inspection staff proceed to Westcoast RoWs.

Project RoW and adjacent Westcoast RoWs

(0930hrs) NEB inspection staff saw an aerial view of the entire Project area from the endpoint of the Project (~KP 22) to CS-N5 (KP 0.0) that will be inspected more in detail tomorrow. NEB staff also saw aerial view of all 8 water crossings and associated unnamed tributaries as per EPP: Mackie Creek, Lynx creek, Brenot creek and Portage creek for the 30", 36' and 42" pipeline RoWs.

Station N5 (CS-N5)

- Facility is fenced, graveled.
- New in-line inspection launcher (42" line) and associated valves located on the eastern side of the facility.
- Appropriate vegetation breaks present between fence line and wooded areas.
- Facility signage present at main access gate.
- This facility will be inspected in more detail tomorrow.

~KP 1.0 Watercourse (WC) 1 – unnamed tributary to Mackie Creek

- Pipeline identification signage present on both sides of watercourse crossings.
- Channel bed and banks are rock armoured.
- Vegetation is establishing along the Project RoW.
- 30" & 36" RoWs are well vegetated.
- Microsites (for seed germination), created by cleat marks are present on steep hill south of watercourse, where vegetation is establishing.
- Creek bed and banks are stable with no signs of erosion along all RoWs.

~KP 1.3 WC 2 – unnamed tributary to Mackie Creek

- Pipeline identification signage present on both sides of watercourse crossings.
- Channel bed and banks are rock armoured.
- Vegetation is establishing along the Project RoW.
- 30" & 36" RoWs are well vegetated.
- Microsites (for seed germination), created by cleat marks are present on steep hill north of watercourse, where vegetation is establishing.
- Creek bed and banks stable with no signs of erosion along all RoWs.

~KP 2.0 Crown Land

- Stabilization and erosion control measure observed to be appropriate.
- Vegetation is establishing along the Project RoW.
- 30" & 36" RoWs are well vegetated.
- Westcoast representative confirmed that RoW and TWS in the Project area were seeded with a BC northern forestry mix as recommended by the provincial authority.

Inspector Initials / Initiales de l'Inspecteur

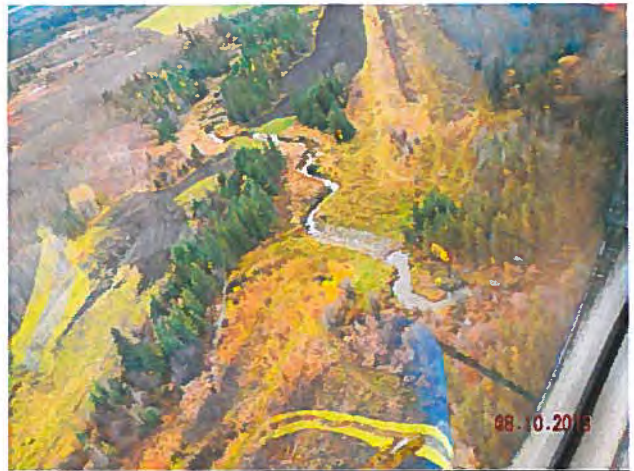
Representative Initials / Initiales du représentant

~KP 2.5 Road Access

- Pipeline identification signage present at road crossing.
- 30" RoW is well vegetated.
- Vegetation along the Project RoW and associated disturbed areas is establishing.
- Drainage in the area is rock-armoured.

~KP 3.3 WC 3 - Mackie Creek

- Beaver dam present upstream from watercourse crossing, which reduces water flow and creates a barrier for fish passage.
- Vegetation is well established in disturbed areas affected by O&M activities conducted in 2011/12 on the 30" & 36" RoWs.
- Vegetation is well established in riparian areas of the 42" RoW, and vegetation establishing along this RoW to the north and south of the crossing. Westcoast representatives explained that riparian area had been seeded in 2012 during machine clean-up.
- Channel bed and banks of all RoWs through crossings of this watercourse are rock armoured.
- Pipeline identification signage present on both sides of all crossings.



Mackie Creek, looking south. 42" (left), 36" & 30" RoWs (right).

~KP 7.5 WC 4 - Lynx Creek (42" RoW)

(1010hrs) Landed at Lynx Creek and inspected the area.

- Westcoast representatives indicated that final clean-up activities were completed in this area in September 2013.
- Pipeline identification signage present on both sides of the crossing.
- Channel bed and banks were rock armoured.
- Permanent erosion control measures were in place and appropriate on both slopes.
- Westcoast representatives confirmed that the entire area was seeded with a BC northern forestry mix as recommended by provincial authority.
- Seeded vegetation observed to have germinated and begun establishing.
- Straw crimping observed throughout the entire southern slope and on near the top of the northern slope. Westcoast representatives explained that straw crimping was not possible thought the remainder of the northern slope due to steepness.
- Rock filled drainage observed along the bottom of the southern side slope. Westcoast representatives explained that these were associated to a system of measures (including French drains, ditch plugs, and surface waterbars/berms) installed to control groundwater flow and seepage on this slope.
- Northern slope has appropriate erosion control measure consisting of berms & ditches covered with coco-matting.
- Top of banks of the watercourse have planted willow (*salix spp.*) stock present.
- Entire northern and northern and southern slopes planted with plugs of conifer species (White Spruce & Lodgepole Pine) as well as some deciduous species (*Populus spp.* & *Salix spp.*).
- Woody species are appropriately located for their species-specific requirement and adequately spaced. Westcoast also explained that an effort was made to plant woody tree species along the slop to ensure



Lynx Creek (42" RoW), looking south

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Representative Initials / Initiales du représentant

species distribution was similar to adjacent areas off RoW.

Lynx Creek (30" & 36" RoWs)

- O&M activities at this creek were completed in 2011/2012.
- Pipeline identification signage present on both sides of watercourse crossings.
- Riprap armouring of the watercourse bed and banks observed to be stable with no signs of erosion.
- Areas disturbed as part of O&M activities are well vegetated.
- Beaver dam present along the watercourse upstream of RoWs.

-KP 8 WC 5 – unnamed tributary to Lynx Creek

- Pipeline identification signage present on both sides of crossings.
- Riparian areas have well established vegetation.
- Microsites (for seed germination), created by cleat marks are present on steep hill north of watercourse, where vegetation is establishing along the Project RoW.
- RoWs are well vegetated along the Westcoast 30" & 36" lines.

-KP 12.8 WC 6 – Brenot Creek

(1050hrs) Landed at Brenot Creek and inspected the area.

General

- Pipeline identification signage observed on both sides of RoW crossings.
- 30" & 36 RoWs are well vegetated with appropriate permanent erosion control measures.
- Riprap armouring of the watercourse bed and banks are stable with no signs of erosion
- Riparian woody vegetation (*salix spp.*) present at top of armouring.

T-North RoW

- Westcoast representatives indicated that post-construction reclamation activities for the T-North RoW were completed in July 2013.
- Vegetation was well established in this area dominated by Fall Rye.
- Channel bed and banks were rock armoured. Rip-rap is stable and appropriate for the watercourse.
- Permanent erosion control measures were in place and appropriated on both slope approaches to the watercourse.



Brenot Creek (looking south) – left to right (42", 36", and 30" RoWs)

-KP 18.0 WC 7 – Portage Creek

- Pipeline identification signage present on both sides of crossing.
- 30" & 36" RoWs are well vegetated with appropriate permanent erosion control measures.
- Riparian vegetation observed to be well established in riparian areas.
- Microsites (for seed germination), created by cleat marks are present on slopes to either side of the T-North watercourse crossing and vegetation is establishing.

-KP 18.7 WC 8 - Unnamed tributary to Portage Creek

- Pipeline identification signage present on both sides of crossings.
- 30" & 36" RoWs are well vegetated with appropriate permanent erosion control measures.
- Riparian vegetation observed to be well established in riparian areas of the T-North RoW.
- Microsites (for seed germination), created by cleat marks are present on slopes to either side of the T-North watercourse crossing and vegetation is establishing.

Inspector Initials / Initiales de l'Inspecteur

Representative Initials / Initiales du représentant

-KP 22 Above ground facilities

- Observed 42" receiver and tie-over valves.
- Above ground facilities are located in a graveled area.
- No concerns noted.

Dinosaur Lake (Peace River Crossing)

30" & 36" RoWs

- Northern and southern slopes have appropriate, functional permanent erosion control measures.
- RoWs on either side of the crossing are well vegetated.
- No concerns noted.

General Observations

- All observed road and/or access crossings had appropriated crossings in place and pipeline identification signage was present.
- 30" & 36" RoWs were well vegetated with appropriate species.
- Appropriate permanent erosion control measures in place on steep slopes.
- Crop lands along the T-North RoW had no signs of erosion or subsidence and RoW is well blended into the adjacent lands.
- No concerns were identified with signage along RoWs.
- Westcoast representative confirmed that the seeding for the T-North 212 project was seeded in 2012 (in some areas) and completed in 2013 with a BC northern forestry mix as recommended by the provincial authority for watercourse crossings and along Crown Lands, and as requested by landowners for private lands. Seed lots were also verified via seed analysis for Noxious Weed content.
- No undesirable invasive plant growth was identified in reclaimed areas associated with the Project.
- NEB Inspection staff is satisfied with the appropriateness of reclamation and erosion control measures observed at major watercourse crossings associated with the T-North RoW (WC 4, WC 6, WC7).

(1140hrs) Returned to Hudson Hope to deposit P. Boutilier. L. Rainville confirmed that he had identified no concerns with the post-construction reclamation of the T-North RoW and TWS and that no non-compliance to regulatory requirements were identified.

(1200hrs) Departure from the Hudson Hope air strip, en-route to Highland Helicopters at the Fort-St-John airport.

Close Out Meeting

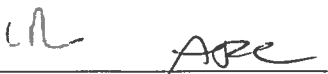
(1230hrs) Returned to Highland Helicopters. NEB IO Luc Rainville conducted closing meeting with B. Thomas and reviewed observations during inspection activity. No non-compliances were identified during the course of the inspection. NEB Inspection staff are satisfied with the quality of final clean-up and reclamation activities observed during this inspection associated with the ~22 Km of RoW for the T-North 2012 Project.

NEB IO would like to thank Westcoast field personnel for their cooperation, and assistance provided during this inspection.

(1300hrs) NEB staff completed inspection and departed.

Enforcement Actions – N/A

END OF REPORT


Inspector Initials / Initiales de l'Inspecteur

Representative Initials / Initiales du représentant

Appendix C

T-North 2012 Photo Review

T-North 2012 Pipeline (2015) Photo Review



KP 0+000 (N) October 22, 2015



KP 0+000 (S) October 22, 2015



KP 0+500 (N) October 22, 2015



KP 0+500 (S) October 22, 2015

T-North 2012 Pipeline (2015) Photo Review



KP 1+000 (N) October 22, 2015



KP 1+000 (S) October 22, 2015



KP 1+500 (N) October 22, 2015



KP 1+500 (S) October 22, 2015