TC Energy Peace River Mainline Abandonment Project

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Introductions: Jenna Rode – A Bit About Me



Introductions: Darcy Bye - A Bit About Me





Reducing Our Environmental Footprint



Members of the Environment – Remediation group are working to assemble the in-situ treatment system for the upcoming field trails of an R&D project which will provide management of environmental impacts as the result of historical operations.















PRML Abandonment Project - Overview

- Line built in 1968 to transport crude oil and converted to transport natural gas in 1972
- Abandonment Scope:
 - 266 km section of NPS 20 Nova Gas Transmission Ltd. (NGTL) Peace River Mainline
 - 2.34 km of NPS 4 Watino Lateral
 - 0.80 km of NPS 4 Hotchkiss North Lateral
 - Decommissioning of the Valleyview Compressor Station
 - All above-ground facilities to be removed
- Scope includes full removal of above and below ground facilities on the 9 km which passes through the Sturgeon Lake Cree Nation (SLCN)



PRML Abandonment Project - Overview

KEY	IVIILESI	UNES

	NGTL filed Notice of Decommissioning with former National Energy Board (NEB), now Canada Energy Regulator (CER)							
Aug. 18, 2012	Application reviewed and in consideration of the nature and scope of the project, the determination was leave to abandon the operation of the pipeline.							
Aug. 18, 2016	NGTL submitted abandonment application							
Jan. 27, 2017	NEB issues Hearing Order							
Feb. 23 – Mar. 16, 2017	Apply to Participate Process							
Aug. 22, 2017	Oral Traditional Evidence Hearing							
Mar. 14, 2018	NEB approves NGTL application to abandon parts of the Peace River Mainline							

PRML Abandonment Project - Overview



- Project Facilities cross 70 km of private freehold land (26%), 189 km of Crown land (70%), 9 km of SLCN Reserve land (4%) - 79 landowners and 37 land users directly affected
- SLCN Changes in Chief and Council and the Prime Contractor selection required continuous negotiations.
- In-depth NEB hearings included written/oral evidence with five groups and individuals granted participation rights; NEB provided almost \$160,000 in funding to support meaningful participation.
- Petroleum Technology Alliance Canada (PTAC) Studies directly linked to PRML Abandonment:
 - PARSC 07 Recommended Practice for Cleaning of Pipelines for Abandonment
 - PARSC 16 PRML Abandoned Pipeline Segment Field Study
 - PARSC = Pipeline Abandonment Research Steering Committee

PRML Abandonment Project - Four Mile Creek

Background

- Historical pipeline river crossing diverted Four Mile creek through two culverts.
- PRML installed on top of a soil embankment and covered with additional soil
- Long-term effects of embankment includes deposition of sediments upstream and scour and channel degradation downstream.



PRML Abandonment Project – Management Strategy

Environmental Consultant – Trace Associates Inc.

TCE Inspector

Waste Management Contractor Construction Contractor



TM N/

6234789 m

443370 m

PRML Abandonment Project – Characterizing Materials and Sampling

- Materials
 - Piping
 - Gaskets
 - Vessels
 - Valves
- Waste Generated
 - Slurry
 - Soil



PRML Abandonment Project – Initial Sampling

Benchmark Soil Sampling

- Pre-disturbance sampling Site Characterization Sampling
- Soil and/or Slurry generated through facility exposure characterized to determine potential contaminates of concern (COCs)

Infrastructure Sampling

• Removed facilities sampled on site or at laydown yard.







PRML Abandonment Project – Data Management and Sample Tracking

Data Management

- Samples processed through combination of data management software and manual processing.
- Easy to follow naming convention for rapid identification

Sample Tracking

 Universal tracking spreadsheet updated daily

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Sito 1	e Aerie	icultural rite	3-44ey	PRHL-STO-NPS20-PIPE01-SED-20101017	Stealpipe	28-inchpipe 3.9 m	17-0-et-18	Site 70			0.05p.Sville 600 cpm	11.0 B 4/4	PCEVNORM	U07410/181190	PCB (RDL above GL bet below Filmelike), NORM (Lead-299)	Cantaminated	Site 1- Quaranture Area (NORMbin)	Fab.15,2019	Closen Harbarz	Securo Pembina	SE-18-050-111/5M	Fob.15,2019	764925
Site 1	e Aerie	icultural rite	3-44ey	PRML-S70-NPS0-PIPE01-SB-20101018	Stealpipe	t-inchpipe (6 zegnestr)	18-0-et-18	Site 70			0.00p.Sofle 25 opm	N/A	POB	UP1732	HZA	Oluen	Site 1	Nav. 29, 2018	Olo-an Harbarz	Ternita Paosa River (Matal Racycling)	13-8-83-23 WSH	Nav. 29, 2018	1955
Site 1	e Aerie	icultural rite	3-44ey	PRML-ST0-MST01-LW-20181018	Valve	Hydrauliefluid fram actuator "25 L	18-0-et-18	Site 70			N/A	N/A	POB	137653	POBr (RDL above rail GL, but below 2 m p/kg)	Oluen	Site 1(Liquid) Sledge)	Fab.52,2019	Cloen Harbarz	TerviteValleyview	69-16-69-22 VISM	Fob.52,2019	AE99399-1/760152
Site 1	e Aerie	icultural rite	3-44ey	PRML-ST0-MST02-S0-20101102	GravelPod	GRAVEL-SOIL LAYER TO 0.2 MBG	62-Max-18	Meetzide of Facility Site 70			N/A	N/A	BTER(F1-F4), Class 2 Los dFill Characterization	US4124	HZA	Oluen	Site 70	144					
Site 1	e Aerie	icultural rite	Regular	PRML-STO-VALVENINF-LM-20101105	Value	Hydraulicfluid Value 0899-0-1590- PPM	65-Na+18	Site 1(Site 70 cantainment)			N/A	N/A	POB	IGB-874	PCBr (RDL above rail GL, but kelou 2 m (rkg)	Olean	Sito 1, Liquid/Sludge area	Fab.12,2019	Olo-an Harbarz	TerviteValleyvicu	69-16-69-22 W5H	Fab.12,2019	AE99399-1/760152
Site 1	e Aerie	icultural rite	Regular	PRML-S76-TALVEO10801-LW-20101905	Valve	Bloadar Lina Valve 0819-0-1510- PPH	65-Nav-18	Site 1(Site 70 containment)			N/A	N/A	POB	IGB-117	PCBr (RDL above rail GL, but below 50 mg/kg)	Olean	Site 1	Nav. 30, 2018	Olo en Harbarz	Ternita Paosa Biver (Matal Bacycling)	13-1-13-23 W5H	Nav. 30, 2010	1955
Site 1	e Aerie	icultural rite	Regular	PRML-S70-WALVE02GR01-LW-20101905	Value	gra are from sheet valve on this chiling	65-Max-10	Site 1(Site 70 centainment)			N/A	N/A	POB	168-175	PCB (72 mg/kg) Abavo disparal GL of 50 mg/kg	Cantonin stad	Site L Avritar Edmonton	Doc. 21, 2018	Austa	Assitar	2425 Industrial Park Dr. Carnuall, ON K6H 7014	Dec. 21, 2018	AF30230-4710103069
Site 1	e Aeric	icultural rite	Regular	PRML-S70-TAL/E02GR02-LV-20101105	Value	bleader lina graere an 8-in ch lina	65-Max-10	Site 1(Site 70 centainment)			N/A	N/A	POB	168-176	PCBr (RDL above rail GL, but belau 50 mg/kg)	Olean	Site 1	Nav. 30, 2018	Olo-an Harbarz	Territa Paoco River (Motal Rocycling)	13-8-83-23 W5H	Nav. 30, 2018	1955
Situ 1	e Aeric	icultural rite	3-44ay	PRML-STO-EXHIBSE01-SO-20101017	Seil	Excorotion furthert worth	17-0-ct-18	Site 70			N/A	N/A	8101(71)	U07479	HVA	Olaan	Site 70	1/1					
Site 1) Aeric	icultural rite	Regular	PRML-573-NP520-PIPE01-58-201112%	StealPipe	20° pipe, 2m, 1af1	16-Do-c=18	Site 73-74 mod crarring	H/A	N/A	0.05µSvila 50 CPM	N/A	POB	U22590	HZA	Olaan	Site 1	Jan. 12, 2019	Taroita	Territa Paoco River (Motal Rocycling)	13-8-83-23 W5H	Jan. 12, 2019	117404
Site 7	4 Aeria	icultural rite	Regular	PRML-S74-NPS26-PIPE01-S8-201112%	StealPipe	20*pipe, 2.5m, 1af1	16-Do-c=18	Site 73-74 mod crarring	H/A	N/A	0.08p.Sofle 100 CPM	N/A	POB	0226.96	HZA	Olaan	Site 1	Jan. 12, 2019	Taroita	Territa Paoco River (Motal Rocycling)	13-8-03-23 W5H	Jan. 12, 2019	117404
Silu 7	s Aeric	icultural rite	2-Day	PRML-S75-DH01COMP01-S0-20101902	Sell	Ditchmatorial fram around valvo	02-Her-18	Site 75			N/A	N/A	BTEN(F1-F4), PCBr, PAH, phoneir, load and moreary, Claur 2 Levidill Characterization	US4079	HVA	Olaan	She 75						
5160 T	s Aeric	icultural rite	Regular	PRML-S75-NPS4-PIPE01-SB-20101114	StealPipe	4-inchpipe 2.8m;1 mf2	54-Max-10	Paoco Rivor TOPL Yard	N/A	N/A	0.06y.Soflar 150 CPM	N/A	POB	007299	HVA	Olean	Silu 1	Dec. 11, 2010	Olo en Harbarz	Territa Peoce River (Metal Recycling)	13-8-83-23 WSH	Dec. 11, 2010	T012919
516 T	s Aeric	icultural rite	Regular	PRHL-S75-NPS4-1LV01-S8-20101114	Valve	4-in-ch valou 0.95 m; 2 of 2	54-Max-10	Paoco Rivor TOPL Yard	N/A	N/A	0.00y.Soflar 350 CPM	0.27Bafan ²	POBMORIE	007303/85000	HVA	Olean	Silu 1	Dec. 11, 2010	Olo en Harberr	Territa Peoce River (Metal Recycling)	13-8-83-23 WSH	Dec. 11, 2010	T012919
Site 7	s Aeric	icultural rite	Regular	PRML-575-NP54-PIPE02-58-20101110	StealPipe	4-is-choipe 3.1m;1 ef1	10-Na+-10	Read crazzing halding collin Valleyries Yard	H/A	N/A	0.05y.Sv/M 100 CPM	N/A	POB	007380	HVA	Olaran	Site 1	Dare: 10,2010	Olo en Harbarz	Tarnita Paoca River (Matal Racycling)	13-8-03-23 WSH	Dare. 10, 2010	T012919
516 T	s Aeric	icultural rite	Regular	PRML-575-NP54-P1PE03-58-20101110	StealPipe	4-inchippo 2.8m;1 of1	10-Na+-10	Read crazzing halding collin Valleyries Yard	N/A	N/A	0.05y.Sv/M 125.0PM	N/A	POB	007201	HVA	Olaran	Site 1	Dare: 10,2010	Olo en Harbarz	Tarnita Paoca River (Matal Racycling)	13-8-03-23 WSH	Dec. 10, 2010	T012919
5110 T	s Aeria	icultural zite	Regular	PRHL-S75-NP54-PIPE01-S8-20101211	StealPipe	4-inchpipe 2.5 m; 1af2,tatel 5 m.	11-De-s=10	Halding cellin Valleyriew Yard	N/A	N/A	0.05y.Sv/M 100 CPM	N/A	POB	015010	NA	Olean	Site 1	Jan. 12, 2019	Tervita	Tarnita Paoca River (Matal Racycling)	13-8-03-23 WSH	Jan. 12, 2019	117404
Site 1	e Aeric	icultural zite		\$10-\$01L-1	Seil	*1m3	24-Aug-10	Excepto dimetarial fram eraund velve	6222781	442777	N/A	N/A	BTEX (F1-F4), POBy, PAHy, Phanaly, Lond and Monoury, Olary 2 Londfill Obsractorization	0022345	HVA	Olean	Site 00						
Site 1	e Aeric	icultural zite	2-44ey	PRML-S00-NPS1-PIPE01-SB-20101031	SteelPipe	1-inchpipe (4 segmente) *10	31-O-et-10	Site 00	6222792	4445.90	0.00p.Sofle 50.cpm	N/A	POB	U\$\$100	HVA	Oliven	Site 1	Nav. 29, 2010	Close, Harbarr	Tarnita Paoca River (Matal Racycling)	12-11-12-22 WFH	Nev. 29, 2010	1955
5ita (Aeria	iceltural zite	Begalar	PRML-S12-NPS20-PIPE01-SB-20101114	SteelPipe	20-in-chipipo 1.9m; 1af1	14-Nav-10	Site #3	N/A	N/A	0.089, Svily 100 CPM	N/A	POB	UU7045	HVA	Oliven	Site 1	Dec. 17, 2010	Tervita	Tarnita Paoca River (Matal Racycling)	12-0-02-22 WSH	Dec. 17, 2010	117347
Site 1	4 Aeria	iceltural zite	Regular	PRML-S14-NPS20-PIPE01-SB-20101114	SteelPipe	20-ischpipe 2.25 m;1ef1	14-Nex-10	Site \$4	N/A	N/A	6.664,SvHz 15 CPM	N/A	POB	UU7090	NA	Olean	Site 1	Dec. 17, 2010	Tervita	Tarnita Paoca River (Matal Racycling)	13-8-03-23 WSH	Dec. 17, 2010	117347
Site 1	s Aeria	iceltural zite		\$\$\$-PIPE-NP5-8-#1	SteelPipe	8-isch 9.7m kyp av kotucon louschor and receiver	20-Aug-18	Containment on routhcoartaids of Value Site 15	6227622	442216	0.064.5484	N/A	POB	U01617	HVA	Oliven	Site 1	Sapt. 15, 2010	Olean Harbarz	Tareita Paloca River (Matal Racycling)	12-31-77-5W6H	Sopt. 15, 2018	96JE01205
5iw (s Aeric	iceltural site		PRHL-SIS-SYP01STKP-SY-20110910	Sharry	ankaous en oras	00-Sep-10	Site \$5, cantainment cell narthe act of values	6227654	442316	N/A	N/A	BTEX (F1-F4), POBy, PAHy, Phenaly, Lond and Mercury, Class 2 Londfill Obstanterization	UG9629	PHO/(F1)	Contoninated, Heate Clare II disposal quidelines fensare no free liquid arius	Site 15	Sept. 19-20	Claion Herbarat Lanorter	Tarrito Spirit River	12-31-77-5 WeH	Sept. 19-20	720746, 720717, 720710, 761211, 761212, 761212, 576920, 620559, 720720, 720721, 761244, 761215.
5ite (s Aeric	iceltural site		PRML-S15-NPS20-PIPE01-SB-20111105	SteelPipe	28-inchpipa 1,27m	05-0et-18	Site 85 Pipe canteinment	6227654	442216	0.00µ.Soflar 40 cpm	N/A	POB	UH6917	NA	Olean	Silu 1	Nav. 54, 2919	Closen Harbarr	Tareita Paroca River (Matal Racycling)	12-1-12-23 W9H	Nev. 14, 2010	96,3201244
Situ	s Aeric	icultural rite	2-Day	PRHL-505-PD#1-DF-28181031	PiqqisqDircharqa	Octabor 28, 2018 Piqqinq run 1*13 L	31-0 ct - 18	Site 05	6227622	6227622	0.15p.Sofle 100 opm	N/A	Doen – Stark, pH, Hoavy Motale (34 elementer), Doarity, BTEX, PHC F1-F4, PCB, PAHr and Phonale	053551/053571/185434	BTER, PHO F1-F4, POB (RDL abave guidative, but below 50 motion), PANo, phonale ""Na guidative far de avertark	Cantanineted	She 15	Oct.28,2010	Olo an Marbarz	Taroita Spirit River	12-31-77-5 W6H	0 et. 28, 2018	736973

PRML-S103-EX01NWLL02-SO-20190307 VALEY-S1-NPS20PIPE03-SB-20180907 VALEY-S1-NPS20PIPE05-SED-20180907

PRML Abandonment Project – Waste Characterization & Final Sampling

Prescence/Absence Investigation

- If characterization samples identified COCs, presence/absence investigations were conducted
- Disposal
- Tracking sheet distributed and infrastructure sorted for recycle or disposal

Benchmark Confirmatory Sampling

Post-disturbance soil samples



PRML Abandonment Project – Overall Success

- Collected and processed 1,197 samples
- Completed the handling and appropriate disposal
 - 8,300 tonnes of soil
 - ~ 5,000 cubes of slurry and wastewater
 - ~ 1,250 tonnes of metal was recycled
- 31 presence/absence investigations completed and met the applicable guidelines









PRML Abandonment Project – General Challenges

- Site logistics fostering adaptability
- Rapid data management and communication
- Changing guidelines AEP 2016 to 2019
- Remote locations affecting sample delivery
- Mother Nature
- Project is first of its kind









PRML Abandonment Project – Learnings

Be proactive!

- Collect every available sample
- Collect every possible matrix of sample
- Collect background samples to confirm suspected natural exceedances
- Hydrovac crews removed additional soil if impacts were suspected



PRML Abandonment Project – What Went Well

- Safety The belief in safety for everyone!
- Bureau Veritas Canada (2019) Inc. Labs Portal
- Naming convention / tracking sheet
- The Report
- The Project
 - Collaboration
 - Innovation
 - Sustainability
 - General Attitudes



PRML Abandonment Project – Duration



