5.0 MAIN BASE

5.1 Site Description

The Main Base (also referred to as "the old base", "the upper site" and the "TACAN site" in previous environmental reports) has an area of approximately 45 hectares and is located on the top of a hill approximately 1.2 km northwest of the main area of the Community of Hopedale. The Main Base served as the Tactical Air Navigation Site (TACAN) when the Site was operational and included the radar complex, maintenance building, generator building, accommodations buildings and several additional buildings required to service the complex. All that remains of the former site infrastructure are the concrete foundations. A site plan showing the site layout is provided in Appendix 5A (Drawing No. 121411777.610-EE-04). Photos of the Main Base are provided in Appendix 5B.

The POL West is located in the southwest corner of the Main Base area. The area historically contained a vertical AST and an access road. The road is still present and the location of the tank is evidenced by a blasted bedrock face in the area surrounding monitor well MW-7.

Terrain in the vicinity of the Main Base is moderately sloped and surface drainage (apparent groundwater flow direction) appears to be in all directions. There are distinct drainage courses in the Main Base area that drain to the northwest through the former sewage outfall and to the southeast towards Pit No. 2. The area consists of gravel, bedrock outcrops and low vegetation and alders.

5.2 Description of Site Work

Additional sampling was carried out at the Main Base in 2013 in order to further delineate the extent of PCB-impacted soil and to further investigate the POL West. The following sections present the results of the additional delineation program, including a description of the sub-surface conditions encountered during the investigation and a characterization of the existence and extent (where possible) of soil and groundwater impacts.

5.2.1 Field Work

Field work in this area included the collection of bulk soil samples from 26 hand-dug test pits (13-MB-BS1 to 13-MB-BS13, 13-MB-BS15 to 13-MB-BS17 and 13-POLW-BS1 to 13-POLW-BS10). Drawing No. 121411777.610-EE-05 in Appendix 5A shows the locations of the soil samples from the current and previous site investigations. The locations of soil samples collected by ESG in 2004 and 2006 are also shown on Drawing No. 121411777.610-EE-05 in Appendix 4A (refer to ESG, 2007). The PCB-impacted areas were referred to by ESG as Old Base 2a, Old Base 2b, Old Base 2c and surrounding the Radome (refer to Figure 1 in Section 1.1, herein).

5.2.2 Stratigraphy

Basic stratigraphic information was recorded during the collection of soil samples. Overburden materials were fairly thin, with depths to bedrock ranging from 0.02 to 0.5 m in each test pit. Photos showing the typical overburden materials encountered at Main Base are provided in Appendix 5B.

PCB impacts in the main (i.e., largest) PCB-impacted area originate in two areas with drainage pathways that merge south of the former troposcatter dishes and POL tanks (refer to Drawing No. 121411777.610-EE_05 in Appendix 5A). The northwest extent of the main PCB-impacted area consists of thin and inconsistent soil coverage (up to 0.10 m, where present) and extends over a vertical bedrock face. Soil in this area consists of dark brown silty sand and gravel. The northeast extent of the impacted area extends down a vegetated valley and consists of approximately 0.3 to 0.5 m of rootmat over dark brown silty sand with cobbles and gravel overlying bedrock. The lower portion of the main PCB-impacted area is boggy and generally consists of 0.4 to 0.5 m of rootmat over saturated dark brown silty sand with organics. Refusal occurred on bedrock at each sampling location in this area.

Overburden materials surrounding the radome foundation (in the vicinity of samples 13-MB-BS15 to 13-MB-BS17) consisted primarily of moss over boulders with patches of brown sand, gravel and cobbles. Test pits were terminated on cobbles/boulders at approximately 0.10 m depth in this area.

Overburden materials in the POL West area generally consisted of light brown gravelly sand fill over medium grey sand and cobbles. The depth to bedrock in this area ranged from 0.04 m to 0.1 m. Refusal occurred on presumed bedrock at each sampling location in this area.

5.2.3 Groundwater Conditions

Groundwater was observed in test pits 13-MB-BS4 (0.5 mbgs), 13-MB-BS5 (0.5 mbgs) and 13-MB-BS8 (0.3 mbgs). Groundwater seepage was not observed during the excavation of the remaining test pits. Based on local topography and site observations the direction of groundwater flow in the Main Base area is inferred to be in all directions, including to the northwest through the former sewage outfall and to the southeast towards Pit No. 2. The assumed directions of groundwater flow are shown on Drawing No. 121411777-EE-05 in Appendix 5A.

5.2.4 Debris

Buried debris was not encountered in any of the test pits during this investigation. Recent campfire debris was observed at ground surface in the vicinity of sample 13-POLW-BS6.

5.2.5 Free Phase Petroleum Hydrocarbons

There was no evidence of measurable (i.e., >1 mm thickness) free liquid phase petroleum hydrocarbons in test pits excavated during the current investigation. Petroleum hydrocarbon sheening was observed on groundwater in test pit 13-MB-BS8. Moderate to strong petroleum hydrocarbon odours were detected in test pits 13-MB-BS4, 13-MB-BS8 and 13-POLW-BS3 and slight petroleum hydrocarbon odours were detected in test pits 13-POLW-BS6 and 13-POLW-BS7.

5.2.6 Tar-Like Material

An area of un-remediated tar was observed at the base of a vertical bedrock face near the center of the main PCB-impacted area. This material was sampled by ESG in 2006 and was confirmed to contain elevated levels of PCBs (refer to sample 22488 in ESG, 2007). Photo 10 in Appendix 5B shows the tar-like substance.

There was no visual evidence of tar in any of the soil samples collected from Main Base during the current investigation.

5.3 Laboratory Analysis Results

Results of laboratory analysis of soil obtained from this area are presented in Tables 5-1 to 5-7 in Appendix 5C along with the analytical results of previous investigations. Corresponding analytical reports from Maxxam Analytics for the 2013 field program are presented in Appendix 16A.

Petroleum Hydrocarbons in Soil

Petroleum hydrocarbon (TPH/BTEX) analysis was conducted on 13 soil samples collected from Main Base in 2013 (13-MB-BS4B, 13-MB-BS6, 13-MB-BS8, 13-MB-BS9, 13-POLW-BS1, 13-POLW-BS2, 13-POLW-BS3, 13-POLW-BS5, 13-POLW-BS6, 13-POLW-BS7, 13-POLW-BS9, 13-POLW-BS10 and 13-POLW-BS11), which includes one (1) field duplicate sample (13-POLW-BS11 is a field duplicate of 13-POLW-BS5). Results of the laboratory analysis of soil samples for TPH/BTEX are presented in Table 5-1 in Appendix 5C.

With the exception of sample POLW-BS1, modified TPH was detected in each of the soil samples analyzed at concentrations ranging from 160 mg/kg to 37,000 mg/kg. The laboratory analytical reports indicated that products impacting the soil samples collected in the vicinity of the main PCB-impacted area (13-MB-BS4B, 13-MB-BS6, 13-MB-BS8 and 13-MB-BS9) resembled the weathered fuel oil fraction and products impacting the soil samples collected from the POL West area generally resembled the weathered fuel oil and lube oil fractions. The concentrations of modified TPH detected in soil samples 13-MB-BS4B (21,000 mg/kg), 13-MB-BS6 (5,900 mg/kg), 13-MB-BS8 (37,000 mg/kg) and 13-MB-BS9 (2,300 mg/kg) exceeded the TPH SSTL of 1,700 mg/kg.

BTEX parameters were not detected in any of the soil samples submitted for analysis.

PCBs in Soil

PCB analysis was conducted on 26 soil samples collected from Main Base in 2013 (13-MB-BS1 to 13-MB-BS17, 13-POLW-BS1, 13-POLW-BS3, 13-POLW-BS5, and 13-POLW-BS8 to 13-POLW-BS11), which includes two (2) field duplicate samples (13-MB-BS14 is a field duplicate of 13-MB-BS12 and 13-POLW-BS11 is a field duplicate of 13-POLW-BS5). Also, three (3) laboratory duplicate samples were analyzed (13-MB-BS2B Lab-Dup, 13-MB-BS9 Lab-Dup and 13-MB-BS15 Lab-Dup). Results of the laboratory analysis of soil samples for PCBs are presented in Table 5-2 in Appendix 5C.

Concentrations of PCBs were detected in 17 of the soil samples submitted for analysis. Detected concentrations of PCBs ranged from 0.15 mg/kg to 8,900 mg/kg. The concentrations of PCBs in soil samples 13-MB-BS1 (12 mg/kg), 13-MB-BS12 and its field duplicate sample (8,400 mg/kg and 8,900 mg/kg, respectively), 13-MB-BS13 (5,300 mg/kg) and 13-POLW-BS10 (22 mg/kg) exceeded the SSTL calculated for the Residential Area (9 mg/kg).

PAHs in Soil

PAH analysis was conducted on two (2) soil samples collected from the POL West portion of the Main Base in 2013 (13-POLW-BS4 and 13-POLW-BS8). Also, one (1) laboratory duplicate sample was analyzed (13-POLW-BS4 Lab-Dup). Results of the laboratory analysis of soil samples for PAHs are presented in Table 5-3 in Appendix 5C.

PAH parameters were not detected in either of the soil samples analyzed.

Available Metals in Soil

Available metals analysis was conducted on three (3) soil samples collected from the POL West portion of the Main Base in 2013 (13-POLW-BS2, 13-POLW-BS4 and 13-POLW-BS9). Results of the laboratory analysis of soil samples for available metals are presented in Table 5-4 in Appendix 5C.

Concentrations of various metals parameters were detected in the soil samples analyzed. The concentrations of chromium in soil samples 13-POLW-BS2 (23 mg/kg) and 13-POLW-BS4 (20 mg/kg) were equal to or exceeded the applicable SSTL of 20 mg/kg.

Petroleum Hydrocarbons in Groundwater

Petroleum hydrocarbon (TPH/BTEX) analysis was conducted on one (1) groundwater sample collected from the POL West portion of the Main Base in 2013 (MW-7). Results of the laboratory analysis of the groundwater sample for TPH/BTEX are presented in Table 5-5 in Appendix 5C.

Modified TPH was detected in groundwater sample MW-7 at a concentration of 0.45 mg/L. The laboratory analytical report indicated that products impacting the groundwater sample resembled one product in the fuel oil/lube oil range. The detected concentration of modified

TPH was below the Tier I RBSL for a residential site with non-potable groundwater, coarse grained soil and fuel oil impacts.

BTEX parameters were not detected in the groundwater sample.

PCBs in Groundwater

PCB analysis was conducted on one (1) groundwater sample collected from the POL West portion of the Main Base in 2013 (MW-7). Results of the laboratory analysis of the groundwater sample for PCBs are presented in Table 5-6 in Appendix 5C.

PCBs were not detected above the laboratory reportable detection limit (0.05 µg/L) in groundwater sample MW-7.

PAHs in Groundwater

PAH analysis was conducted on one (1) groundwater sample collected from the POL West portion of the Main Base in 2013 (MW-7). Results of the laboratory analysis of the groundwater sample for PAHs are presented in Table 5-7 in Appendix 5C.

PAH parameters were not detected above the laboratory reportable detection limits in groundwater sample MW-7.

5.4 Conclusions

Field work completed at the Main Base of the Former U.S. Military Site in Hopedale, NL in 2013 consisted of the additional delineation of PCB impacted soil and further analysis of soil and groundwater in the POL West area. Petroleum hydrocarbon odours were detected on select soil samples collected as part of the PCB delineation program, therefore additional TPH/BTEX analysis was also completed in that area as well. The conclusions of the 2013 field program are summarized below.

1. The Main Base has inconsistent soil coverage, with the thickness of soil cover over bedrock ranging from approximately 0.02 m to 0.5 m in the areas sampled in 2013. Overburden materials consisted primarily of dark brown silty sand and gravel, with some cobbles and organics. Vegetation in the areas sampled in 2013 consisted primarily of grasses and alders.
2. Groundwater was observed in test pits 13-MB-BS4, 13-MB-BS5 and 13-MB-BS8 at depths ranging from 0.3 to 0.5 mbgs. Groundwater seepage was not observed during the excavation of the remaining test pits. Based on local topography and site observations the direction of groundwater flow in the Main Base area is inferred to be in all directions, including to the northwest through the former sewage outfall and to the southeast towards Pit No. 2.
3. Buried debris was not encountered in any of the test pits excavated at the Main Base.

4. An area of un-remediated tar-like material was observed south of sample 13-MB-BS13 (ESG sample 22488).
5. The objective of the additional delineation program was to delineate PCB impacts in soil. Concentrations of PCBs in soil were compared to the SSTL calculated for the Residential Area (9 mg/kg).
6. The current and previous investigations have identified four (4) areas at the Main Base with PCB concentrations in soil exceeding the SSTL calculated for the Residential Area (9 mg/kg). The main (i.e., largest) PCB-impacted area is considered delineated. The estimated limits of the areas of soil requiring PCB-remediation have been updated on the site drawing.
7. Sludge in the former septic tank in the northern portion of Main Base contains PCB concentrations in exceedance of the SSTL calculated for the Residential Area (9 mg/kg).
8. Soil and groundwater sampling in the POL West portion of the Main Base revealed exceedances of the PCB and chromium applicable SSTLs in select soil samples. No issues were identified in the POL West area for petroleum hydrocarbons in soil and groundwater, PAHs in soil and groundwater, or PCBs in groundwater.

5.5 Summary of Environmental Concerns at Main Base

Based on the recommendations of the Phase II/III ESA, HHERA and RAP/RMP prepared by Stantec in 2010, remediation of PCB, TPH and chromium-impacted soil is recommended at the Main Base in order to obtain site-wide EPCs less than the applicable SSTLs. A summary of the estimated soil area and volume of soil requiring remediation is shown in Table 5.1. Depths of impacts were adjusted herein to more accurately reflect the average thickness of soil cover over bedrock.

Table 5.1 Summary of Soil Requiring Remediation - Main Base

Remedial Objectives	Other Issues Identified[1]	Sample Locations	Area (m^2)	Depth (m)	Volume (m^3)	Fully Delineated?	Maximum Concentration (mg/kg)	Priority Level[2]
PCBs, TPH	-	6514, 21484, 22420, 22424, 22435, 22443, 22444, 22469, 22470, 22471, 22478, 22479, 22482, 22483, 22484, 22488, 22492, 22493, 22494, 22496, 22538, 22705, BS110, MB-BS1, MB-BS3, MB-BS5, MB-BS10, 13-MB-BS12, 13-MB-BS13, 13-MB-BS1	2,665	0.3	800	Yes	PCBs: 41,000 TPH: 72,000	2

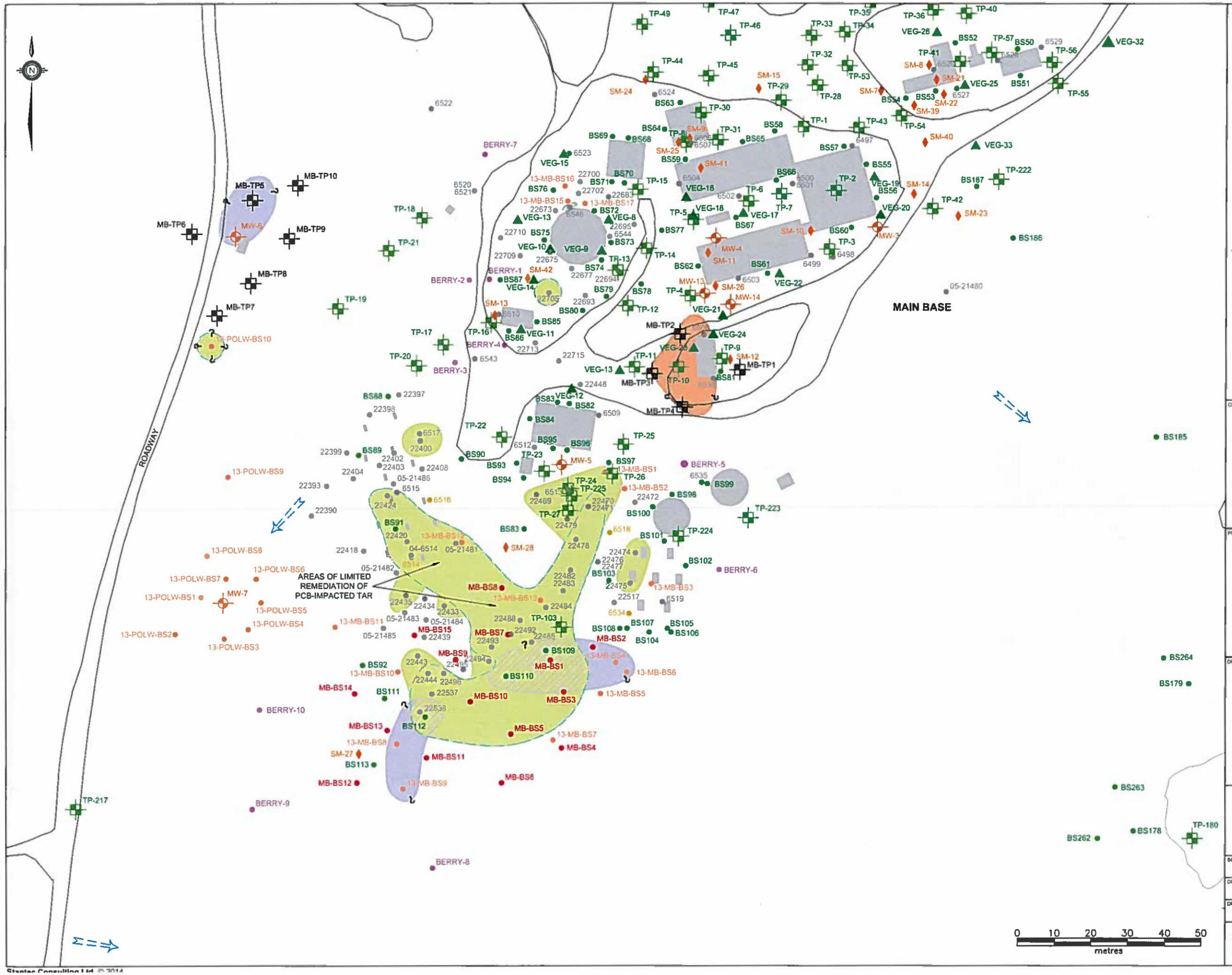
Remedial Objectives	Other Issues Identified[1]	Sample Locations	Area (m^2)	Depth (m)	Volume (m^3)	Fully Delineated?	Maximum Concentration (mg/kg)	Priority Level[2]
PCB	-	22400	50	0.1	5	No	PCBs: 15.7	2
PCB	-	22474, 22475	100	0.1	10	Yes	PCBs: 12.8	2
PCB	-	6546	5	0.2	1	Yes	PCBs: 33	2
PCB	-	22705	40	0.1	4	Yes	PCBs: 1,300	2
PCB	-	13-POLW-BS10	50	0.1	5	No	PCBs: 22	2
PCBs in septic tank sludge	Toluene TPH Tetrachloro-ethylene Antimony Copper Tin Zinc	Septic Tank	-	-	3	Yes	PCBs: 72 Toluene: 15 TPH: 10,000 Tetrachloro-ethylene: 0.5 Antimony: 25 Copper: 87 Tin: 250 Zinc: 1,500	2
TPH	-	MW6, MB-TP5	200	0.5	100	No	TPH: 12,000	3
TPH	-	13-MB-BS4, 13-MB-BS6	145	0.5	73	No	TPH: 21,000	3
TPH	-	13-MB-BS8, 13-MB-BS9	200	0.4	80	No	TPH: 37,000	3
Chromium	TPH, nickel	TP-10, MB-BS3, MB-BS5, MB-BS10	340	0.15	51	No	Chromium: 100 TPH: 2,200 Nickel: 81	4

Notes:
[1] Site data was screened against typical landfill acceptance criteria (1,000 mg/kg for TPH, 33 mg/kg and CCME Industrial guidelines for metals and PCBs). This information is required during the selection of disposal/treatment options. Exceedances of these values do not necessarily represent a risk to human or ecological health.
[2] Priority based on chemical of concern and location of impacts, with 1 being the highest priority and 4 being the lowest priority..

Drawing No. 121411777.610-EE-05 in Appendix 5A shows sample locations and the estimated areas of soil requiring remediation. Photos showing the areas requiring soil remediation are provided in Appendix 5B. Laboratory analytical summary tables for COCs at the Main Base (i.e., TPH/BTEX, PCBs and metals) are provided in Appendix 3C.

APPENDIX 5A

Site Plan – Main Base



LEGEND

- TEST PIT (STANTEC 2010)
- TEST PIT (STANTEC 2009)
- MONITOR WELL (STANTEC 2009)
- BULK SOIL SAMPLE (STANTEC 2013)
- BULK SOIL SAMPLE (STANTEC 2009)
- BULK SOIL SAMPLE (STANTEC 2010)
- BULK SOIL SAMPLE (ESG 2006)
- BULK SOIL SAMPLE (ESG 2004)
- BERRY SAMPLE (STANTEC 2009)
- VEGETATION SAMPLE (STANTEC 2009)
- SMALL MAMMALS (STANTEC 2009)
- UNKNOWN EXTENT OF IMPACTS
- INFERRED GROUNDWATER FLOW DIRECTION
- ESTIMATED AREA OF TPH IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF PCB IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF SOIL CONTAINING PCBs > 22 ppm
- ESTIMATED AREA OF METALS (CHROMIUM) IMPACTED SOIL REQUIRING REMEDIATION
- ESTIMATED AREA OF PCB & TPH IMPACTED SOIL REQUIRING REMEDIATION
- CONCRETE FOUNDATION

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

CLIENT

NEWFOUNDLAND AND LABRADOR DEPARTMENT OF ENVIRONMENT AND CONSERVATION

PROJECT TITLE:

ADDITIONAL DELINEATION AND UPDATED REMEDIAL ACTION PLAN, FORMER U.S. MILITARY SITE, HOPEDALE, NL

DRAWING TITLE:

SITE PLAN - MAIN BASE

Stantec Consulting Ltd.

SCALE:	DATE:	REV No.
1:1000	JULY 16, 2014	0
DRAWN BY: N.M.	EDITED BY: -	CHECKED BY: AR
DRAWING No: 121411777.610-EE-05	CAD FILE: 121411777_610-EE-05.DWG	

Stantec

16 JUL 14 2:00PM

APPENDIX 5B

Site Photos – Main Base

Site Photos – Main Base

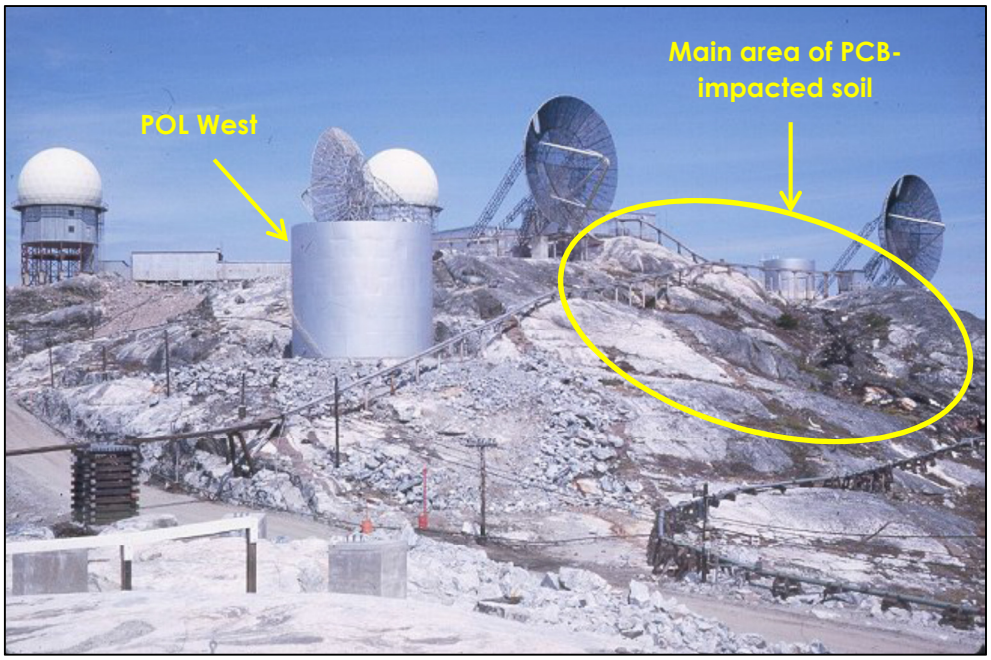


Photo 1. 1963 photo of Main Base, looking northeast. Image from ESG, 2007, courtesy of Millard Jones.

Photo 2. 1968 photograph of the Main Base, looking northwest. Image courtesy of Doug Consul.

Site Photos – Main Base

Photo 3. Concrete foundations currently remaining at Main Base, looking southwest.

Photo 4. Concrete foundations currently remaining at Main Base, looking northwest towards Big Lake

Site Photos – Main Base

Photo 5. Concrete foundations currently remaining at Main Base, looking northeast.

Photo 6. Concrete foundations currently remaining at Main Base, looking east.

Site Photos – Main Base

Photo 7. Road to POL West, looking south.

Photo 8. Former tank location at POL West, looking east. Monitor well MW-7 is visible in the center of the photo.

Site Photos – Main Base

Photo 9. 2009 photo of tar-like substance at Main Base prior to removal.

Photo 10. 2009 photo of tar-like substance in the vicinity of ESG sample 22488.

Site Photos – Main Base

Photo 11. 2009 photo of Main Base during removal of tar-like material, looking east.

Photo 12. 2009 photo of Main Base during removal of tar-like material, looking south.

Site Photos – Main Base

Photo 13. Area of chromium-impacted soil (TP-10, MB-TP2, MB-TP3) requiring removal, looking south-southeast.

Photo 14. Area of chromium-impacted soil (TP-10, MB-TP2, MB-TP3) requiring removal, looking east.

Site Photos – Main Base

Photo 15. Area of PCB/TPH-impacted soil requiring removal, looking south.

Photo 16. Area of PCB/TPH-impacted soil requiring removal, looking southeast.

Site Photos – Main Base

Photo 17. Area of PCB/TPH-impacted soil requiring removal, looking northeast.

Photo 18. Area of PCB/TPH-impacted soil requiring removal, looking east.

Site Photos – Main Base

Photo 19. Area of TPH-impacted soil (MW-6 and MB-TP5) requiring removal, looking northeast

Photo 20. 13-MB-BS4 sample location.

Site Photos – Main Base

Photo 21. 13-MB-BS12 sample location, looking south.

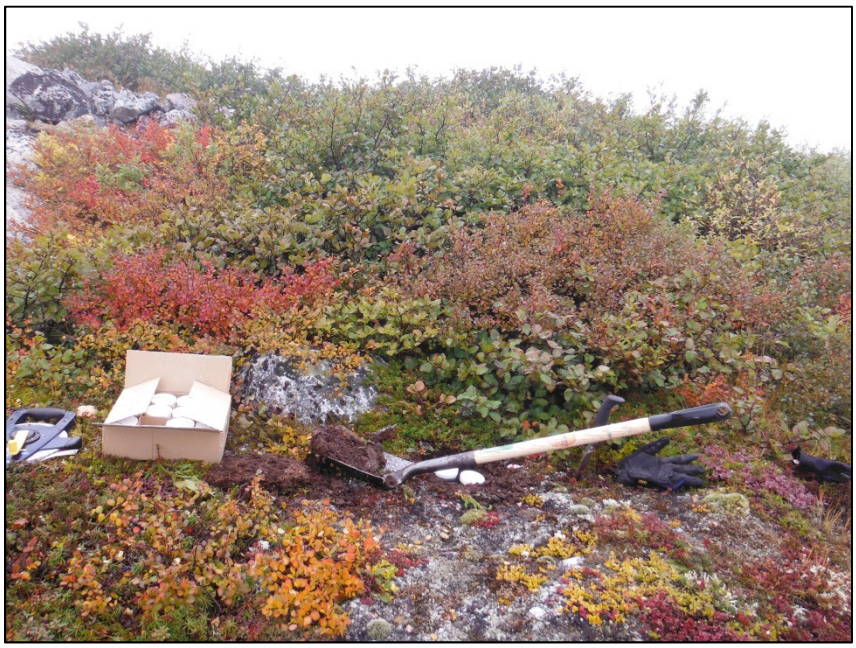


Photo 22. 13-MB-BS13 sample location, looking northeast.

Site Photos – Main Base

Photo 23. Typical substrate encountered at POL West (sample 13-POLW-BS1).

APPENDIX 5C

Analytical Summary Tables – Main Base

Table 5-1 Results of Laboratory Analysis of TPH/BTEX in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	BTEX Parameters				Total Petroleum Hydrocarbons					Reached Baseline at C_{32}?	Resemblence
		Benzene	Toluene	Ethyl-benzene	Xylenes	C_6-C_{10} (Gas Range)	C_{10}-C_{16} (Fuel Range)	C_{16}-C_{21} (Fuel Range)	C_{21}-C_{32} (Lube Range)	Modified TPH - Tier I[3]		
RDL (2009 - 2010)		0.03	0.03	0.03	0.05	3	15		15	20	-	-
RDL (2013)		0.025	0.025	0.025	0.05	2.5	10	10	15	15	-	-
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-
Tier I RBSLs[1]		0.099	77	30	8.8	-	-	-	-	270	-	-
SSTL[2]		-	-	-	-	-	-	-	-	1,700	-	-
2009 Sampling - Stantec												
TP3-BS2	0.8 - 0.9	<0.03	<0.03	<0.03	<0.05	<3	320		290	***600***	-	WFO, LO
TP6-BS2	0.5 - 0.6	<0.03	<0.03	<0.03	<0.05	<3	3,900		270	***4,200***	-	WFO, LO
TP7-BS2	0.6 - 0.8	<0.3	<0.3	***0.08*** (0.3)	***11*** (0.5)	490 (30)	17,000		3,800	***22,000*** (30)	-	FO, LO
TP10-BS1	0.0 - 0.2	<0.03	<0.03	<0.03	<0.05	<3	2,200		83	***2,200***	-	WFO
TP12-BS2	0.8 - 0.9	<0.03	<0.03	<0.03	<0.05	<3	31		81	110	-	FO/LO
TP15-BS2	0.4 - 0.5	<0.03	<0.03	<0.03	<0.05	<3	28		130	160	-	LO
TP15-BS2-Lab-Dup	0.4 - 0.5	-	-	-	-	-	27		150	-	-	-
TP16-BS1	0.1 - 0.3	<0.03	<0.03	<0.03	<0.05	<3	56		110	170	-	FO/LO
TP18-BS2	1.3 - 1.4	<0.03	<0.03	<0.03	<0.05	<3	170		350	***510***	-	FO/LO, LO
TP21-BS2	0.9 - 1.0	<0.03	<0.03	<0.03	<0.05	<3	210		310	***520***	-	FO/LO, LO
TP24-BS2	1.0 - 1.1	<0.03	<0.03	<0.03	<0.05	<3	2,400		290	***2,700***	-	FO/LO, LO
TP30-BS2	1.2 - 1.3	<0.03	4.7	<0.03	<0.05	<3	29		160	180	-	LO
TP33-BS2	1.7 - 1.8	<0.03	<0.03	<0.03	<0.05	<3	50		200	250	-	LO
TP36-BS3	1.4 - 1.5	<0.03	<0.03	<0.03	<0.05	<3	<15		<15	<20	-	NRG
TP36-BS3-Lab-Dup	1.4 - 1.5	<0.03	<0.03	<0.03	<0.05	<3	-		-	-	-	-
TP37-BS1	0.0 - 0.2	<0.03	0.07	<0.03	<0.05	<3	36		360	***400***	-	LO
TP41-BS1	0.6 - 0.8	<0.03	<0.03	<0.03	<0.05	<3	45		380	***420***	-	FO, LO
TP42-BS2	1.3 - 1.5	<0.03	<0.03	<0.03	<0.05	<3	170		450	***620***	-	FO, LO
TP43-BS2	1.5 - 1.7	<0.3	<0.3	<0.3	<0.5	800	22,000		2,300	***25,000*** (80)	-	FO, LO

Notes:

1 = Partnership in RBCA (Risk-Based Corrective Action) Implementation (PIRI) Tier I Risk Based Screening Levels (RBSLs) for a residential site with non-potable groundwater and coarse grained soil, fuel oil impacts (July 2012)

2 = SSTL calculated for TPH at the Former Radar Site (Stantec, 2010)

3 = Modified TPH - Tier I does not include BTEX

4 = From TPH fractionation results

5 = Triple silica gel cleanup was used on all 2013 samples to remove organic interferences from sample extract

RDL = Reportable Detection Limit for routine analysis

(#) = Elevated RDL shown in brackets

Lab-dup = Laboratory duplicate sample

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds generic criteria (i.e., Tier I RBSL) for a residential site with potable groundwater, coarse grained soil and fuel oil impacts

Shaded = Value exceeds SSTL calculated for TPH at Former Radar Site (Stantec, 2010)

Resemblance

FO = Fuel oil fraction

LO = Lube oil fraction

NRG = Does not resemble gasoline or diesel

WFO = Weathered fuel oil fraction

FO/LO = One product in fuel oil/lube oil range

Table 5-1 Results of Laboratory Analysis of TPH/BTEX in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	BTEX Parameters				Total Petroleum Hydrocarbons					Reached Baseline at C_{32}?	Resemblence
		Benzene	Toluene	Ethyl-benzene	Xylenes	C_6-C_{10} (Gas Range)	C_{10}-C_{16} (Fuel Range)	C_{16}-C_{21} (Fuel Range)	C_{21}-C_{32} (Lube Range)	Modified TPH - Tier I[3]		
RDL (2009 - 2010)		0.03	0.03	0.03	0.05	3	15		15	20	-	-
RDL (2013)		0.025	0.025	0.025	0.05	2.5	10	10	15	15	-	-
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-
Tier I RBSLs[1]		0.099	77	30	8.8	-	-	-	-	270	-	-
SSTL[2]		-	-	-	-	-	-	-	-	1,700	-	-
2009 Sampling - Stantec (...continued)												
TP44-BS2	1.7 - 1.9	<0.03	<0.03	<0.03	<0.05	<3	<15		<15	<20	-	NRG
TP52-BS1	0.1 - 0.2	<0.03	<0.03	<0.03	<0.05	<3	<15		20	20	-	Possible LO
TP53-BS1	0.4 - 0.6	<0.03	<0.03	<0.03	<0.05	<3	390		410	***800***	-	WFO, LO
TP54-BS2	1.2 - 1.3	<0.03	<0.03	<0.03	<0.05	<3	50		160	210	-	FO, LO
TP54-BS2-Lab-Dup	1.2 - 1.3	-	-	-	-	-	46		160	-	-	-
TP58-BS2	0.9 - 1.0	<0.03	<0.03	<0.03	<0.05	<3	180		1,200	***1,400***	-	FO/LO, LO
TP62-BS1	0.5 - 0.6	<0.03	<0.03	<0.03	<0.05	<3	48		160	210	-	FO/LO, LO
TP65-BS1	0.0 - 0.2	<0.03	<0.03	<0.03	<0.05	<3	20		69	89	-	Possible LO
TP68-BS2	0.7 - 0.9	<0.03	<0.03	<0.03	<0.05	<3	<15		44	44	-	NRG
TP69-BS2	1.3 - 1.4	<0.03	<0.03	<0.03	<0.05	<3	<15		50	50	-	Possible LO
TP214-BS1	0.6 - 0.7	<0.03	<0.03	<0.03	<0.05	<3	20		72	92	-	WFO, LO
TP214-BS1 Lab-Dup	0.6 - 0.7	<0.03	<0.03	<0.03	<0.05	<3	-		-	-	-	-
TP220-BS2	1.4 - 1.5	<0.03	<0.03	<0.03	<0.05	<3	22		110	130	-	LO
TP221-BS2	1.5 - 1.6	<0.03	<0.03	<0.03	<0.05	<3	580		2,000	***2,500***	-	LO
TP221-BS2-Lab-Dup	1.5 - 1.6	-	-	-	-	-	610		2,100	-	-	-
TP222-BS2	1.6 - 1.7	<0.03	<0.03	<0.03	<0.05	<3	60		300	***360***	-	LO
TP223-BS1	0.4 - 0.5	<0.03	<0.03	<0.03	<0.05	<3	<15		49	49	-	NRG
TP224-BS1	0.0 - 0.2	<0.03	<0.03	<0.03	<0.05	<3	160		32	200	-	WFO
TP225-BS2	1.6 - 1.7	<0.03	0.17	0.04	0.23	230	8,300		180	***8,700***	-	WFO

Notes:

1 = Partnership in RBCA (Risk-Based Corrective Action) Implementation (PIRI) Tier I Risk Based Screening Levels (RBSLs) for a residential site with non-potable groundwater and coarse grained soil, fuel oil impacts (July 2012)

2 = SSTL calculated for TPH at the Former Radar Site (Stantec, 2010)

3 = Modified TPH - Tier I does not include BTEX

4 = From TPH fractionation results

5 = Triple silica gel cleanup was used on all 2013 samples to remove organic interferences from sample extract

RDL = Reportable Detection Limit for routine analysis

(#) = Elevated RDL shown in brackets

Lab-dup = Laboratory duplicate sample

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds generic criteria (i.e., Tier I RBSL) for a residential site with potable groundwater, coarse grained soil and fuel oil impacts

Shaded = Value exceeds SSTL calculated for TPH at Former Radar Site (Stantec, 2010)

Resemblance

FO = Fuel oil fraction
LO = Lube oil fraction
NRG = Does not resemble gasoline or diesel
WFO = Weathered fuel oil fraction
FO/LO = One product in fuel oil/lube oil range

Table 5-1 Results of Laboratory Analysis of TPH/BTEX in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	BTEX Parameters				Total Petroleum Hydrocarbons					Reached Baseline at C_{32}?	Resemblence
		Benzene	Toluene	Ethyl-benzene	Xylenes	C_6-C_{10} (Gas Range)	C_{10}-C_{16} (Fuel Range)	C_{16}-C_{21} (Fuel Range)	C_{21}-C_{32} (Lube Range)	Modified TPH - Tier I[3]		
RDL (2009 - 2010)		0.03	0.03	0.03	0.05	3	15		15	20	-	-
RDL (2013)		0.025	0.025	0.025	0.05	2.5	10	10	15	15	-	-
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-
Tier I RBSLs[1]		0.099	77	30	8.8	-	-	-	-	270	-	-
SSTL[2]		-	-	-	-	-	-	-	-	1,700	-	-
2009 Sampling - Stantec (...continued)												
BS48	0.0 - 0.10	<0.03	<0.03	<0.03	<0.05	<3	62		490	***550***	-	LO, ULO
BS58	0.0 - 0.20	<0.03	<0.03	<0.03	<0.05	<3	<15		<15	<20	-	NRG
BS81	0.0 - 0.12	<0.03	<0.03	<0.03		9	1,900		260	***2,200***	-	WFO, Possible LO
BS97	0.0 - 0.15	<0.03	<0.03	<0.03	<0.05	<3	33		320	***360***	-	LO
BS104	0.0 - 0.05	0.04	0.14	<0.03	<0.05	<3	60		290	***350***	-	FO/LO, LO
BS110	0.0 - 0.20	<0.03	<0.03	<0.03	<0.05	<3	67,000		3,700	***71,000***	-	WFO, Possible LO
BS112	0.0 - 0.22	<0.03	<0.03	<0.03	<0.05	<3	9,900		2,100	***12,000***	-	WFO
BS265	Not	<0.03	<0.03	<0.03	<0.05	<3	76		670	***750***	-	LO
MW1-SS1	0.0 - 0.3	<0.03	<0.03	<0.03	<0.05	<3	270		290	***560***	-	FO/LO LO
MW2-SS1	0.0 - 0.5	<0.03	<0.03	<0.03	<0.05	<3	180		500	***680***	-	FO/LO LO
MW3-SS1	0.0 - 0.5	<0.03	<0.03	<0.03	<0.05	<3	400		590	***990***	-	WFO, LO
MW4-SS1	0.0 - 0.4	<0.03	<0.03	<0.03	<0.05	5	1,400		51	***1,500***	-	WFO, Possible LO
MW5-SS1	0.0 - 0.3	<0.03	<0.03	<0.03	<0.05	4	4,400		330	***4,700***	-	WFO, LO
MW6-SS1	0.0 - 0.6	<0.03	<0.03	<0.03	<0.05	40	12,000		460	***12,000***	-	WFO, LO
MW14-SS3[4]	1.21 - 1.37	<0.03	<0.03	0.09	0.18	-	-		-	***2,000*** (80)		G/FO
Septic Tank	0.0 - 0.1	<0.03	15	<0.03	0.34	21	3,700		6,700	***10,000***	-	FO/LO, UFO/LO

Notes:

1 = Partnership in RBCA (Risk-Based Corrective Action) Implementation (PIRI) Tier I Risk Based Screening Levels (RBSLs) for a residential site with non-potable groundwater and coarse grained soil, fuel oil impacts (July 2012)

2 = SSTL calculated for TPH at the Former Radar Site (Stantec, 2010)

3 = Modified TPH - Tier I does not include BTEX

4 = From TPH fractionation results

5 = Triple silica gel cleanup was used on all 2013 samples to remove organic interferences from sample extract

RDL = Reportable Detection Limit for routine analysis

(#) = Elevated RDL shown in brackets

Lab-dup = Laboratory duplicate sample

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds generic criteria (i.e., Tier I RBSL) for a residential site with potable groundwater, coarse grained soil and fuel oil impacts

Shaded = Value exceeds SSTL calculated for TPH at Former Radar Site (Stantec, 2010)

Resemblance

FO = Fuel oil fraction
LO = Lube oil fraction
FO/LO = One product in fuel oil/lube oil rang
UFO/LO = Unidentified compound(s) in fuel/lube oil range
WFO = Weathered fuel oil fraction
G/FO = One product in the gasoline/fuel oil ran
NRG = Does not resemble gasoline or diesel
ULO = Unidentified compound(s) in lube oil range

Table 5-1 Results of Laboratory Analysis of TPH/BTEX in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	BTEX Parameters				Total Petroleum Hydrocarbons					Reached Baseline at C_{32}?	Resemblence
		Benzene	Toluene	Ethyl-benzene	Xylenes	C_6-C_{10} (Gas Range)	C_{10}-C_{16} (Fuel Range)	C_{16}-C_{21} (Fuel Range)	C_{21}-C_{32} (Lube Range)	Modified TPH - Tier I[3]		
RDL (2009 - 2010)		0.03	0.03	0.03	0.05	3	15		15	20	-	-
RDL (2013)		0.025	0.025	0.025	0.05	2.5	10	10	15	15	-	-
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-
Tier I RBSLs[1]		0.099	77	30	8.8	-	-	-	-	270	-	-
SSTL[2]		-	-	-	-	-	-	-	-	1,700	-	-
2010 Sampling - Stantec												
MB-TP5 BS1	0.0 - 0.3	<0.03	<0.03	<0.03	<0.05	<3	9,400	1,900	940	***12,000***	-	WFO
MB-TP6 BS1	0.0 - 0.15	<0.03	<0.03	<0.03	<0.05	<3	14	12	140	160	-	WFO, LO
MB-TP8 BS1	0.0 - 0.15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	57	57	-	NRLO
MB-TP9 BS1	0.0 - 0.3	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	65	65	-	NRLO
MB-BS1	0.0 - 0.15	<0.03	<0.03	<0.03	<0.05	<3	93	73	17,000	***17,000***	-	NRLO
MB-BS5	0.0 - 0.15	<0.03	<0.03	<0.03	<0.05	<3	12	<10	510	***520***	-	NRLO, FO
MB-BS9	0.0 - 0.1	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	<15	<20	-	-
MB-BS10	0.0 - 0.1	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	200	200	-	NRLO
MB-BS11	0.0 - 0.2	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	60	60	-	NRLO
MB-BS13	0.0 - 0.15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	<15	<20	-	-
MB-BS13 Lab-Dup	0.0 - 0.15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	<15	-	-	-
MB-BS111	0.0 - 0.2	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	19	<20	-	NRLO

Notes:

1 = Partnership in RBCA (Risk-Based Corrective Action) Implementation (PIRI) Tier I Risk Based Screening Levels (RBSLs) for a residential site with non-potable groundwater and coarse grained soil, fuel oil impacts (July 2012)

2 = SSTL calculated for TPH at the Former Radar Site (Stantec, 2010)

3 = Modified TPH - Tier I does not include BTEX

4 = From TPH fractionation results

5 = Triple silica gel cleanup was used on all 2013 samples to remove organic interferences from sample extract

RDL = Reportable Detection Limit for routine analysis

(#) = Elevated RDL shown in brackets

Lab-dup = Laboratory duplicate sample

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds generic criteria (i.e., Tier I RBSL) for a residential site with potable groundwater, coarse grained soil and fuel oil impacts

Shaded = Value exceeds SSTL calculated for TPH at Former Radar Site (Stantec, 2010)

Resemblance

FO = Fuel oil fraction
LO = Lube oil fraction
FO/LO = One product in fuel oil/lube oil rang
UFO/LO = Unidentified compound(s) in fuel/lube oil range
WFO = Weathered fuel oil fraction
G/FO = One product in the gasoline/fuel oil ran
NRG = Does not resemble gasoline or diesel
ULO = Unidentified compound(s) in lube oil range

Table 5-1 Results of Laboratory Analysis of TPH/BTEX in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	BTEX Parameters				Total Petroleum Hydrocarbons					Reached Baseline at C_{32}?	Resemblence
		Benzene	Toluene	Ethyl-benzene	Xylenes	C_6-C_{10} (Gas Range)	C_{10}-C_{16} (Fuel Range)	C_{16}-C_{21} (Fuel Range)	C_{21}-C_{32} (Lube Range)	Modified TPH - Tier I[3]		
RDL (2009 - 2010)		0.03	0.03	0.03	0.05	3	15		15	20	-	-
RDL (2013)		0.025	0.025	0.025	0.05	2.5	10	10	15	15	-	-
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-
Tier I RBSLs[1]		0.099	77	30	8.8	-	-	-	-	270	-	-
SSTL[2]		-	-	-	-	-	-	-	-	1,700	-	-
2013 Sampling - Stantec[5]												
13-MB-BS4B	0.25 - 0.5	<0.025	<0.025	<0.025	<0.050	18	14,000	6,900	730	***21,000***	Yes	WFO
13-MB-BS6	0.2 - 0.4	<0.025	<0.025	<0.025	<0.050	<2.5	2,500	3,100	310	***5,900***	Yes	WFO
13-MB-BS8	0.3 - 0.4	<0.025	<0.025	<0.025	<0.050	24	26,000	11,000	880	***37,000***	Yes	WFO
13-MB-BS9	0.0 - 0.3	<0.025	<0.025	<0.025	<0.050	<2.5	1,300	880	120	***2,300***	Yes	WFO
13-POLW-BS1	0.0 - 0.1	<0.025	<0.025	<0.025	<0.050	<2.5	<10	<10	<15	<15	Yes	-
13-POLW-BS2	0.0 - 0.04	<0.025	<0.025	<0.025	<0.050	<2.5	81	480	150	***710***	Yes	FO/LO
13-POLW-BS3	0.0 - 0.1	<0.025	<0.025	<0.025	<0.050	<2.5	710	570	110	***1,400***	Yes	WFO
13-POLW-BS5	0.0 - 0.1	<0.025	<0.025	<0.025	<0.050	<2.5	27	75	80	180	No	WFO, LO
13-POLW-BS11 Field Dup. for 13-POLW-BS5	0.0 - 0.1	<0.025	<0.025	<0.025	<0.050	<2.5	20	47	93	160	No	WFO, LO
13-POLW-BS6	0.0 - 0.1	<0.025	<0.025	<0.025	<0.050	<2.5	110	280	66	***450***	Yes	WFO
13-POLW-BS7	0.0 - 0.1	<0.025	<0.025	<0.025	<0.050	<2.5	190	330	120	***640***	Yes	WFO
13-POLW-BS9	0.0 - 0.06	<0.025	<0.025	<0.025	<0.050	<2.5	<10	<10	97	97	No	NRLO
13-POLW-BS10	0.0 - 0.1	<0.025	<0.025	<0.025	<0.050	<2.5	<10	<10	78	78	No	Possible LO

Notes:

1 = Partnership in RBCA (Risk-Based Corrective Action) Implementation (PIRI) Tier I Risk Based Screening Levels (RBSLs) for a residential site with non-potable groundwater and coarse grained soil, fuel oil impacts (July 2012)

2 = SSTL calculated for TPH at the Former Radar Site (Stantec, 2010)

3 = Modified TPH - Tier I does not include BTEX

4 = From TPH fractionation results

5 = Triple silica gel cleanup was used on all 2013 samples to remove organic interferences from sample extract

RDL = Reportable Detection Limit for routine analysis

(#) = Elevated RDL shown in brackets

Lab-dup = Laboratory duplicate sample

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds generic criteria (i.e., Tier I RBSL) for a residential site with potable groundwater, coarse grained soil and fuel oil impacts

Shaded = Value exceeds SSTL calculated for TPH at Former Radar Site (Stantec, 2010)

Resemblance

FO = Fuel oil fraction

WFO = Weathered fuel oil fraction

LO = Lube oil fraction

FO/LO = One product in fuel oil/lube oil range

NRLO = No resemblance to petroleum products in the lube oil range

Table 5-2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	Generic Criteria[1]	1.3	-
	Remedial Target[2]	9	-
ESG 2005			
6514	0 - 0.1	***12,000***	-
6515*	0 - 0.1	nd	-
6516	0 - 0.1	nd	-
6517*	0 - 0.1	nd	-
6509*	0 - 0.1	***1.8***	-
6513*	0 - 0.1	***4.2***	-
6518	0 - 0.1	***3.5***	-
6519*	0 - 0.1	***2.2***	-
6534	0 - 0.1	***4.0***	-
6544	0 - 0.1	0.6	-
6546	0 - 0.1	***33***	-
6526*	0 - 0.1	nd	-
6527*	0 - 0.1	nd	-
6528*	0 - 0.1	nd	-
6529*	0 - 0.1	nd	-
6530	0 - 0.1	nd	-
6532*	0.3	nd	-
6533	0 - 0.1	***6.0***	-
6537*	0.3 - 0.4	nd	-
6538*	0 - 0.1	nd	-
6539*	0 - 0.1	nd	-
6540*	0.4 - 0.5	nd	-
6542*	0 - 0.1	nd	-
6497*	0 - 0.1	nd	-
6498*	0 - 0.1	nd	-
6499*	0 - 0.1	***1.7***	-
6500*	0 - 0.1	nd	-
6502*	0 - 0.1	***1.6***	-
6503*	0 - 0.1	nd	-
6504	0 - 0.1	0.6	-
6505*	0 - 0.1	nd	-
6506*	0 - 0.1	nd	-
6507*	0.3	nd	-
6508*	0 - 0.1	nd	-
6510*	0 - 0.1	nd	-
6512*	0 - 0.1	nd	-
6520*	0 - 0.1	nd	-
6522*	0 - 0.1	nd	-
6523*	0 - 0.1	nd	-
6524*	0 - 0.1	nd	-
6525*	0 - 0.1	nd	-
6535*	0 - 0.1	nd	-

Notes:
1 = CCME Canadian Soil Quality Guideline (CSQG) for a Residential/Parkland Site (CCME on-line 2014)
2 = SSTL calculated for PCBs in the Residential Area (Stantec, 2010)
* = Analysis carried out with field test kit
RDL = Reportable Detection Limit for routine analysis
Lab-dup = Laboratory duplicate sample
< # = Not detected above RDL noted
Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)
Shaded = Value exceeds SSTL calculated for PCBs at Former Radar Site (Stantec, 2010)

Table 5-2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	Generic Criteria[1]	1.3	-
	Remedial Target[2]	9	-
ESG 2005 (...continued)			
6536*	0 - 0.1	nd	-
6543*	0 - 0.1	nd	-
6545*	0 - 0.1	nd	-
6597*	0 - 0.1	nd	-
6598*	0 - 0.1	nd	-
6599*	0 - 0.1	nd	-
21480	0 - 0.1	***2.0***	-
21482	0 - 0.1	nd	-
21483	0 - 0.1	***2.4***	-
21484	0 - 0.1	***28***	-
21485	0 - 0.1	***2.7***	-
21486	0 - 0.1	***2.1***	-
21558	0 - 0.1	1.0	-
21559	0 - 0.1	nd	-
21562	0 - 0.1	***1.4***	-
21563	0 - 0.1	nd	-
21566	0 - 0.1	nd	-
21567	0 - 0.1	0.6	-
ESG 2007			
22390	0 - 0.1	0.6	-
22393	0 - 0.1	0.7	-
22397	0 - 0.1	nd	-
22398	0 - 0.1	0.6	-
22399	0 - 0.1	nd	-
22400	0 - 0.1	***15.7***	-
22402	0 - 0.1	***6.0***	-
22403	0 - 0.1	***2.0***	-
22404	0 - 0.1	nd	-
22408	0 - 0.1	***1.8***	-
22418	0 - 0.1	nd	-
22420	0 - 0.1	***33***	-
22424	0 - 0.1	***24.3***	-
22433	0 - 0.1	***9.2***	-
22434	0 - 0.1	nd	-
22435	0 - 0.1	***15.5***	-
22439	0 - 0.1	***1.5***	-
22443	0 - 0.1	***9.6***	-
22444	0 - 0.1	***1,480***	-
22448	0 - 0.1	nd	-
22469	0 - 0.1	***13.5***	-
22470	0 - 0.1	***22.5***	-
22471	0 - 0.1	***22.4***	-

Notes:
1 = CCME Canadian Soil Quality Guideline (CSQG) for a Residential/Parkland Site (CCME on-line 2014)
2 = SSTL calculated for PCBs in the Residential Area (Stantec, 2010)
* = Analysis carried out with field test kit
RDL = Reportable Detection Limit for routine analysis
Lab-dup = Laboratory duplicate sample
< # = Not detected above RDL noted
Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)
Shaded = Value exceeds SSTL calculated for PCBs at Former Radar Site (Stantec, 2010)

Table 5-2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	Generic Criteria[1]	1.3	-
	Remedial Target[2]	9	-
ESG 2007 (...continued)			
22472	0 - 0.1	nd	-
`	0 - 0.1	***12.8***	-
22475	0 - 0.1	***12.7***	-
22476	0 - 0.1	0.6	-
22477	0 - 0.1	nd	-
22478	0 - 0.1	***73.1***	-
22479	0 - 0.1	***10.4***	-
22482	0 - 0.1	***152***	-
22483	0 - 0.1	***30.6***	-
22484	0 - 0.1	***56.5***	-
22485	0 - 0.1	0.6	-
22488	0 - 0.1	***20,200***	-
22492	0 - 0.1	***6,370***	-
22493	0 - 0.1	***44.2***	-
22494	0 - 0.1	***14.9***	-
22495	0 - 0.1	***3.4***	-
22496	0 - 0.1	***30.8***	-
22517	0 - 0.1	***8.1***	-
22537	0 - 0.1	***7.2***	-
22538	0 - 0.1	***82.5***	-
22673	0 - 0.1	nd	-
22675	0 - 0.1	2.2	-
22677	0 - 0.1	4.6	-
22683	0 - 0.1	1	-
22693	0 - 0.1	1.3	-
22694	0 - 0.1	4.9	-
22695	0 - 0.1	nd	-
22700	0 - 0.1	nd	-
22705	0 - 0.1	***1,300***	-
22709	0 - 0.1	nd	-
22713	0 - 0.1	nd	-
22715	0 - 0.1	0.7	-

Notes:
1 = CCME Canadian Soil Quality Guideline (CSQG) for a Residential/Parkland Site (CCME on-line 2014)
2 = SSTL calculated for PCBs in the Residential Area (Stantec, 2010)
* = Analysis carried out with field test kit
RDL = Reportable Detection Limit for routine analysis
Lab-dup = Laboratory duplicate sample
< # = Not detected above RDL noted
Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)
Shaded = Value exceeds SSTL calculated for PCBs at Former Radar Site (Stantec, 2010)

Table 5-2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	Generic Criteria[1]	1.3	-
	Remedial Target[2]	9	-
2009 Sampling - Stantec			
TP7-BS2	0.6 - 0.8	<0.05	-
TP13-BS2	1.0 - 1.1	***2.3***	-
TP16-BS1	0.1 - 0.3	<0.05	-
TP20-BS2	0.4 - 1.3	***6.2***	-
TP21-BS2	0.9 - 1.0	***3.2***	-
TP24-BS2	1.0 - 1.1	<0.05	-
TP31-BS2	0.8 - 0.9	<0.05	-
TP37-BS1	0.0 - 0.2	<0.05	-
TP41-BS1	0.6 - 0.8	0.95	-
TP43-BS2	1.5 - 1.7	<0.05	-
TP52-BS1	0.1 - 0.2	<0.05	-
TP62-BS1	0.5 - 0.6	0.59	-
TP62-BS1-Lab-Dup	0.5 - 0.6	0.56	-
TP68-BS2	0.7 - 0.8	<0.05	-
TP69-BS2	1.3 - 1.4	0.51	-
TP214-BS1	0.6 - 0.7	<0.05	-
TP220-BS2	1.4 - 1.5	***3.4***	-
TP221-BS2	1.5 - 1.6	0.24	-
TP222-BS2	1.6 - 1.7	0.37	-
TP223-BS1	0.4 - 0.5	<0.05	-
TP224-BS1	0.0 - 0.2	<0.05	-
BS43	0.0 - 0.14	***1.7***	-
BS44	0.0 - 0.05	***2.2***	-
BS46	0.0 - 0.15	0.73	-
BS53	0.0 - 0.08	1.3	-
BS57	0.0 - 0.17	0.77	-
BS61	0.0 - 0.15	<0.05	-
BS65	0.0 - 0.15	0.38	-
BS68	0.0 - 0.22	<0.05	-
BS72	0.0 - 0.15	<0.05	-
BS75	0.0 - 0.05	0.30	-
BS76	0.0 - 0.04	0.09	-
BS78	0.0 - 0.10	0.06	-
BS81	0.0 - 0.12	***1.7***	-
BS84	0.0 - 0.10	0.81	-
BS91	0.0 - 0.12	1.3	-
BS95	0.0 - 0.05	***2.3***	-
BS95-Lab-Dup	0.0 - 0.05	***1.8***	-
BS100	0.0 - 0.15	***5.5***	-
BS110	0.0 - 0.20	***53***	-
BS113	0.0 - 0.18	***1.4***	-
BS265	Not recorded	1.1	-

Notes:
1 = CCME Canadian Soil Quality Guideline (CSQG) for a Residential/Parkland Site (CCME on-line 2014)
2 = SSTL calculated for PCBs in the Residential Area (Stantec, 2010)
* = Analysis carried out with field test kit
RDL = Reportable Detection Limit for routine analysis
Lab-dup = Laboratory duplicate sample
< # = Not detected above RDL noted
Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)
Shaded = Value exceeds SSTL calculated for PCBs at Former Radar Site (Stantec, 2010)

Table 5-2 Results of Laboratory Analysis of PCBs in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	Sample Depth (m)	Polychlorinated Biphenyls (PCBs)	Comments
	RDL	0.05	-
	Units	mg/kg	-
	Generic Criteria[1]	1.3	-
	Remedial Target[2]	9	-
2009 Sampling - Stantec (...continued)			
MW1-SS1	0.15 - 0.8	<0.05	-
MW14-SS3	1.2 - 1.4	<0.05	-
Septic Tank	0.0 - 0.1	***72***	-
2010 Sampling - Stantec			
MB-BS1	0.0 - 0.15	***41,000***	-
MB-BS1 Lab Dup	0.0 - 0.15	***39,000***	-
MB-BS3	0.0 - 0.15	***650***	-
MB-BS5	0.0 - 0.15	***1,600***	-
MB-BS7	0.0 - 0.1	***3.2***	-
MB-BS9	0.0 - 0.1	***6.4***	-
MB-BS10	0.0 - 0.1	***910***	-
2013 Sampling - Stantec			
13-MB-BS1	0.0 - 0.3	***12***	Tag No. 16
13-MB-BS2A	0.0 - 0.25	***3.0***	Tag No. 17
13-MB-BS2B	0.25 - 0.5	0.26	Tag No. 17
13-MB-BS2B Lab-Dup	0.25 - 0.5	0.33	Tag No. 17
13-MB-BS3	0.0 - 0.02	***2.8***	Tag No. 18
13-MB-BS4A	0.15 - 0.25	<0.050	Tag No. 19
13-MB-BS4B	0.25 - 0.5	<0.050	Tag No. 19
13-MB-BS5	0.3 - 0.5	<0.050	Tag No. 20
13-MB-BS6	0.2 - 0.4	<0.050	Tag No. 21
13-MB-BS7	0.0 - 0.05	<0.050	Tag No. 22
13-MB-BS8	0.3 - 0.4	<0.050	Tag No. 23
13-MB-BS9	0.0 - 0.3	<0.050	Tag No. 24
13-MB-BS9 Lab-Dup	0.0 - 0.1	<0.050	Tag No. 24
13-MB-BS10	0.0 - 0.1	0.28	Tag No. 25
13-MB-BS11	0.0 - 0.1	<0.050	Tag No. 26
13-MB-BS12	0.0 - 0.1	***8,400***	Tag No. 27
13-MB-BS14 (Field Dup. of 13-MB-BS12)	0.0 - 0.1	***8,900***	Tag No. 27
13-MB-BS13	0.0 - 0.1	***5,300***	Tag No. 28
13-MB-BS15	0.0 - 0.2	0.17	Tag No. 39
13-MB-BS15 Lab-Dup	0.0 - 0.2	0.30	Tag No. 39
13-MB-BS16	0.0 - 0.1	0.19	Tag No. 40
13-MB-BS17	0.0 - 0.1	0.16	Tag No. 41
13-POLW-BS1	0.0 - 0.1	0.15	Tag No. 33
13-POLW-BS3	0.0 - 0.1	<0.050	Tag No. 31
13-POLW-BS5	0.0 - 0.1	***2.4***	Tag No. 29
13-POLW-BS11 (Field Dup. of 13-POLW-BS5)	0.0 - 0.1	1.2	Tag No. 29
13-POLW-BS8	0.0 - 0.05	0.46	Tag No. 36
13-POLW-BS9	0.0 - 0.06	0.36	Tag No. 37
13-POLW-BS10	0.0 - 0.1	***22***	Tag No. 38

Notes:

1 = CCME Canadian Soil Quality Guideline (CSQG) for a Residential/Parkland Site (CCME on-line 2014)

2 = SSTL calculated for PCBs in the Residential Area (Stantec, 2010)

* = Analysis carried out with field test kit

RDL = Reportable Detection Limit for routine analysis

Lab-dup = Laboratory duplicate sample

< # = Not detected above RDL noted

Bold/Italics = Value exceeds generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for PCBs at Former Radar Site (Stantec, 2010)

Table 5-3 Results of Laboratory Analysis of PAHs in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Parameters	RDL (2009 and 2013 Test Pits)	RDL (2009 Monitor Wells)	Units	B(a)P PEF	CCME $CSQG_{HH}$ [1]	HH Guidelines - Other Jurisdictions [2]	CCME $CSQG_{EH}$ [1]	2009 Sampling - Stantec						
								TP7-BS2	TP8-BS2	TP13-BS2	TP17-BS2	TP21-BS2	TP24-BS2	TP24-BS2 Lab-Dup
Non-carcinogenic PAHs														
1-Methylnaphthalene	0.01	0.005	mg/kg	-	-	560*	-	29	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
2-Methylnaphthalene	0.01	0.005	mg/kg	-	-	560*	-	41 (0.05)	<0.01	<0.01	<0.01	0.05	<0.01	<0.01
Acenaphthene	0.01	0.005	mg/kg	-	-	96*	-	7.8	<0.01	<0.01	<0.01	0.05	<0.01	<0.01
Acenaphthylene	0.01	0.005	mg/kg	-	-	9.6*	-	0.91	<0.01	<0.01	<0.01	0.03	0.06	0.05
Anthracene	0.01	0.005	mg/kg	-	-	4,200*	2.5	2	<0.01	0.02	0.04	0.13	<0.04	<0.03
Fluoranthene	0.01	0.005	mg/kg	-	-	9.6*	50	7	<0.01	0.06	0.01	2.3	<0.01	<0.01
Fluorene	0.01	0.005	mg/kg	-	-	5,600*	-	7.3	<0.01	<0.01	<0.01	0.06	<0.01	<0.01
Naphthalene	0.01	0.005	mg/kg	-	-	2,800*	0.6	21	<0.01	<0.01	<0.01	0.07	<0.01	<0.01
Perylene	0.01	0.005	mg/kg	-	-	2,800**	-	0.1	<0.01	<0.01	<0.01	0.07	<0.01	<0.01
Phenanthrene	0.01	0.005	mg/kg	-	-	3,800**	5	16	<0.01	0.04	0.01	0.93	<0.01	<0.01
Pyrene	0.01	0.005	mg/kg	-	-	96*	10	5.2	<0.01	0.06	0.02	1.7	<0.01	<0.01
Carcinogenic PAHs														
Benzo(a)anthracene	0.01	0.005	mg/kg	0.1	-	-	1	***1.1***	<0.01	0.03	0.01	0.45	<0.01	<0.01
Benzo(a)pyrene	0.01	0.005	mg/kg	1	-	-	20	0.27	<0.01	0.03	0.01	0.24	<0.01	<0.01
Benzo(b)fluoranthene	0.01	0.005	mg/kg	0.1	-	-	1	0.4	<0.01	0.03	0.02	0.24	<0.01	<0.01
Benzo(j)fluoranthene	0.01	-	mg/kg	0.01	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	0.01	0.005	mg/kg	0.1	-	-	1	0.4	<0.01	0.03	0.02	0.24	<0.01	<0.01
Benzo(g,h,i)perylene	0.01	0.005	mg/kg	0.1	-	-	1	0.09	<0.01	0.03	0.05	0.20	<0.01	<0.01
Chrysene	0.01	0.005	mg/kg	0.01	-	-	-	1.4	<0.01	0.04	0.02	0.53	<0.01	<0.01
Dibenz(a,h,)anthracene	0.01	0.005	mg/kg	1	-	-	1	0.03	<0.01	<0.01	<0.01	0.05	<0.01	<0.01
Indeno(1,2,3-c,d) pyrene	0.01	0.005	mg/kg	0.1	-	-	1	0.12	<0.01	0.03	0.04	0.17	<0.01	<0.01
		Benzo (a)pyrene TPE		-	5.3 [1,3,4]	-	-	0.517	0.012	0.048	0.025	0.407	0.012	0.012

Notes:

1 = Canadian Counsel of Ministers of the Environment (CCME) Soil Quality Guidelines for the Protection of Environmental and Human Health (CSQG on-line 2014). As per CCME recommendations, soil samples are compared against the soil quality guidelines for the protection of human health and environmental health separately. Residential land use.

2 = Human Health Criteria for non-carcinogenic PAHs in soil. Guidelines from other jurisdictions applied in the absence of applicable CCME guidelines. Source guideline for specific PAH parameter:*Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.I of the Environmental Protection Act April 15, 2011. Soil Components for Table 3 – Full Depth, Non-potable Scenario (lowest applicable human health guideline); **Texas Risk Reduction Program (TRRP) Tier I protective concentration level (PCL), Table 5 (June 2012).

3 = Carcinogenic PAHs assessed as B[a]P TPE for Human Health

4 = Based on CCME guidelines for ingestion, inhalation and dermal exposures. Where a parameter is not detected, 1/2 of the RDL is used in the TPE calculation.

B(a)P TPE = Benzo(a)pyrene Total Potency Equivalent concentration.

B[a]P PEF = Benzo(a)pyrene Potency Equivalent Factor.

RDL = Reportable Detection Limit.

< # = Not detected above RDL noted

(#) = Elevated RDL shown in brackets

"-" = not analyzed, not applicable or no applicable guideline.

Bold/Italics = Value exceeds generic criteria for the protection of human health or ecological health

Table 5-3 Results of Laboratory Analysis of PAHs in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.600

Parameters	RDL (2009 and 2013 Test Pits)	RDL (2009 Monitor Wells)	Units	B(a)P PEF	CCME $CSQG_{HH}$[1]	HH Guidelines - Other Jurisdictions[2]	CCME $CSQG_{EH}$[1]	2009 Sampling - Stantec						
								TP25-BS2	TP37-BS1	TP43-BS2	TP49-BS2	TP57-BS1	TP58-BS2	MW14-SS3
Non-carcinogenic PAHs														
1-Methylnaphthalene	0.01	0.005	mg/kg	-	-	560*	-	0.11	<0.01	0.27	<0.01	<0.01	<0.01	2.6
2-Methylnaphthalene	0.01	0.005	mg/kg	-	-	560*	-	0.08	<0.01	0.58	<0.01	<0.01	<0.01	1.8
Acenaphthene	0.01	0.005	mg/kg	-	-	96*	-	0.89	<0.01	6.5	<0.01	<0.01	<0.01	0.15
Acenaphthylene	0.01	0.005	mg/kg	-	-	9.6*	-	0.10	0.02	0.31	0.03	<0.01	<0.01	<0.005
Anthracene	0.01	0.005	mg/kg	-	-	4,200*	2.5	0.59	0.03	2.4	0.06	<0.01	0.02	<0.005
Fluoranthene	0.01	0.005	mg/kg	-	-	9.6*	50	4.1	0.04	***33***	0.02	0.05	0.05	<0.005
Fluorene	0.01	0.005	mg/kg	-	-	5,600*	-	0.77	<0.01	0.06	<0.01	<0.01	<0.01	0.13
Naphthalene	0.01	0.005	mg/kg	-	-	2,800*	0.6	0.03	0.02	0.09	<0.01	<0.01	<0.01	***0.89***
Perylene	0.01	0.005	mg/kg	-	-	2,800**	-	0.66	0.05	4.6	0.04	<0.01	<0.01	<0.005
Phenanthrene	0.01	0.005	mg/kg	-	-	3,800**	5	3.2	0.03	2.4	<0.01	<0.01	0.02	0.068
Pyrene	0.01	0.005	mg/kg	-	-	96*	10	2.8	0.16	***42***	0.03	0.05	0.04	<0.005
Carcinogenic PAHs														
Benzo(a)anthracene	0.01	0.005	mg/kg	0.1	-	-	1	***2.0***	0.04	***17***	0.02	<0.01	0.03	<0.005
Benzo(a)pyrene	0.01	0.005	mg/kg	1	-	-	20	2.2	0.17	18	0.08	<0.01	0.02	<0.005
Benzo(b)fluoranthene	0.01	0.005	mg/kg	0.1	-	-	1	***2.0***	0.14	***17***	0.08	0.0	0.02	<0.005
Benzo(j)fluoranthene			mg/kg	0.01	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	0.01	0.005	mg/kg	0.1	-	-	1	***2.0***	0.14	***17***	0.09	0.0	0.02	<0.005
Benzo(g,h,i)perylene	0.01	0.005	mg/kg	0.1	-	-	1	***1.8***	0.18	***11***	0.07	0.02	0.05	<0.005
Chrysene	0.01	0.005	mg/kg	0.01	-	-	-	2.3	0.23	18	0.07	0.05	0.03	<0.005
Dibenz(a,h,)anthracene	0.01	0.005	mg/kg	1	-	-	1	0.50	0.06	***3.6***	0.02	<0.01	<0.01	<0.005
Indeno(1,2,3-c,d) pyrene	0.01	0.005	mg/kg	0.1	-	-	1	***2.1***	0.14	***12***	0.08	0.02	0.02	<0.005
		Benzo (a)pyrene TPE		-	5.3[1,3,4]	-	-	3.55	0.280	***28.2***	0.128	0.019	0.035	0.006

Notes:

1 = Canadian Counsel of Ministers of the Environment (CCME) Soil Quality Guidelines for the Protection of Environmental and Human Health (CSQG on-line 2014). As per CCME recommendations, soil samples are compared against the soil quality guidelines for the protection of human health and environmental health separately. Residential land use.

2 = Human Health Criteria for non-carcinogenic PAHs in soil. Guidelines from other jurisdictions applied in the absence of applicable CCME guidelines. Source guideline for specific PAH parameter:*Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.I of the Environmental Protection Act April 15, 2011. Soil Components for Table 3 – Full Depth, Non-potable Scenario (lowest applicable human health guideline); **Texas Risk Reduction Program (TRRP) Tier I protective concentration level (PCL), Table 5 (June 2012).

3 = Carcinogenic PAHs assessed as B[a]P TPE for Human Health

4 = Based on CCME guidelines for ingestion, inhalation and dermal exposures. Where a parameter is not detected, 1/2 of the RDL is used in the TPE calculation.

B(a)P TPE = Benzo(a)pyrene Total Potency Equivalent concentration.

B[a]P PEF = Benzo(a)pyrene Potency Equivalent Factor.

RDL = Reportable Detection Limit.

< # = Not detected above RDL noted

(#) = Elevated RDL shown in brackets

"-" = not analyzed, not applicable or no applicable guideline.

Bold/Italics = Value exceeds generic criteria for the protection of human health or ecological health

Table 5-3 Results of Laboratory Analysis of PAHs in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.600

Parameters	RDL (2009 and 2013 Test Pits)	RDL (2009 Monitor Wells)	Units	B(a)P PEF	CCME $CSQG_{HH}$ [1]	HH Guidelines - Other Jurisdictions [2]	CCME $CSQG_{EH}$ [1]	2009 Sampling - Stantec		2013 Sampling - Stantec		
								MW14-SS3 Lab-Dup	Septic Tank	13-POLW-BS4	13-POLW-BS4 Lab-Dup	13-POLW-BS8
Non-carcinogenic PAHs												
1-Methylnaphthalene	0.01	0.005	mg/kg	-	-	560*	-	2.9	1.7	<0.010	<0.010	<0.010
2-Methylnaphthalene	0.01	0.005	mg/kg	-	-	560*	-	2.0	2.2	<0.010	<0.010	<0.010
Acenaphthene	0.01	0.005	mg/kg	-	-	96*	-	0.16	0.4	<0.010	<0.010	<0.010
Acenaphthylene	0.01	0.005	mg/kg	-	-	9.6*	-	<0.005	<0.3	<0.010	<0.010	<0.010
Anthracene	0.01	0.005	mg/kg	-	-	4,200*	2.5	<0.005	1.3	<0.010	<0.010	<0.010
Fluoranthene	0.01	0.005	mg/kg	-	-	9.6*	50	<0.005	8.6	<0.010	<0.010	<0.010
Fluorene	0.01	0.005	mg/kg	-	-	5,600*	-	0.14	0.5	<0.010	<0.010	<0.010
Naphthalene	0.01	0.005	mg/kg	-	-	2,800*	0.6	***1.1***	***2.0***	<0.010	<0.010	<0.010
Perylene	0.01	0.005	mg/kg	-	-	2,800**	-	<0.005	<0.3	<0.010	<0.010	<0.010
Phenanthrene	0.01	0.005	mg/kg	-	-	3,800**	5	0.077	2.9	<0.010	<0.010	<0.010
Pyrene	0.01	0.005	mg/kg	-	-	96*	10	<0.005	5.0	<0.010	<0.010	<0.010
Carcinogenic PAHs												
Benzo(a)anthracene	0.01	0.005	mg/kg	0.1	-	-	1	<0.005	***2.0***	<0.010	<0.010	<0.010
Benzo(a)pyrene	0.01	0.005	mg/kg	1	-	-	20	<0.005	0.9	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	0.01	0.005	mg/kg	0.1	-	-	1	<0.005	0.7	<0.010	<0.010	<0.010
Benzo(j)fluoranthene			mg/kg	0.01	-	-	-	-	-	<0.010	<0.010	<0.010
Benzo(k)fluoranthene	0.01	0.005	mg/kg	0.1	-	-	1	<0.005	0.8	<0.010	<0.010	<0.010
Benzo(g,h,i)perylene	0.01	0.005	mg/kg	0.1	-	-	1	<0.005	0.5	<0.010	<0.010	<0.010
Chrysene	0.01	0.005	mg/kg	0.01	-	-	-	<0.005	1.9	<0.010	<0.010	<0.010
Dibenz(a,h,)anthracene	0.01	0.005	mg/kg	1	-	-	1	<0.005	<0.3	<0.010	<0.010	<0.010
Indeno(1,2,3-c,d) pyrene	0.01	0.005	mg/kg	0.1	-	-	1	<0.005	0.4	<0.010	<0.010	<0.010
			Benzo (a)pyrene TPE	-	5.3 [1,3,4]	-	-	0.006	1.46	0.013	0.013	0.013

Notes:

1 = Canadian Counsel of Ministers of the Environment (CCME) Soil Quality Guidelines for the Protection of Environmental and Human Health (CSQG on-line 2014). As per CCME recommendations, soil samples are compared against the soil quality guidelines for the protection of human health and environmental health separately. Residential

2 = Human Health Criteria for non-carcinogenic PAHs in soil. Guidelines from other jurisdictions applied in the absence of applicable CCME guidelines. Source guideline for specific PAH parameter:*Ontario Ministry of the Environment (MOE) Soil, Groundwater and Sediment Standards for Use Under Part XV.I of the Environmental Protection Act April 15, 2011. Soil Components for Table 3 – Full Depth, Non-potable Scenario (lowest applicable human health guideline); **Texas Risk Reduction Program (TRRP) Tier I protective concentration level (PCL), Table 5 (June 2012).

3 = Carcinogenic PAHs assessed as B[a]P TPE for Human Health

4 = Based on CCME guidelines for ingestion, inhalation and dermal exposures. Where a parameter is not detected, 1/2 of the RDL is used in the TPE calculation.
B(a)P TPE = Benzo(a)pyrene Total Potency Equivalent concentration.

B[a]P PEF = Benzo(a)pyrene Potency Equivalent Factor.

RDL = Reportable Detection Limit.

< # = Not detected above RDL noted

(#) = Elevated RDL shown in brackets

"-" = not analyzed, not applicable or no applicable guideline.
Bold/Italics = Value exceeds generic criteria for the protection of human health or ecological health

Table 5-4 Results of Laboratory Analysis of Available Metals in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Parameters	RDL	Units	Generic Criteria[1]	SSTL[2]	2009 Sampling - Stantec									
					TP1-BS2	TP1-BS2 Lab-Dup	TP2-BS2	TP7-BS2	TP8-BS2	TP10-BS1	TP12-BS2	TP13-BS2	TP16-BS1	TP17-BS2
				Sample Depth (m)	0.3 - 0.5	0.3 - 0.5	0.3 - 0.8	0.6 - 0.8	0.9 - 1.0	0.0 - 0.2	0.8 - 0.9	1.0 - 1.1	0.1 - 0.3	0.9 - 1.0
Aluminum	10	mg/kg	-	-	7,500	7,300	7,600	6,800	7,400	6,500	7,400	6,500	6,600	9,000
Antimony	2	mg/kg	20	5	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Arsenic	2	mg/kg	12	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Barium	5	mg/kg	500	-	40	38	29	30	15	45	33	27	43	39
Beryllium	2	mg/kg	4	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth	2	mg/kg	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron	5	mg/kg	-	-	<5	<5	<5	<5	<5	<5	<5	<5	6	<5
Cadmium	0.3	mg/kg	10	1.3	<0.3	<0.3	<0.3	<0.3	0.9	<0.3	<0.3	1.0	0.3	<0.3
Chromium	2	mg/kg	64	20	62	57	32	30	14	55	29	19	20	35
Cobalt	1	mg/kg	50	-	7	6	4	6	5	9	6	6	5	8
Copper	2	mg/kg	63	-	23	25	12	21	17	26	26	18	15	31
Iron	50	mg/kg	-	-	11,000	12,000	8,600	10,000	8,900	13,000	12,000	10,000	9,200	15,000
Lead	0.5	mg/kg	140	75	9.3	9.1	7.1	26	23	15	11	70	18	11
Lithium	2	mg/kg	-	-	10	9	8	7	5	10	9	8	6	9
Manganese	2	mg/kg	-	-	160	160	84	130	110	170	130	140	150	220
Mercury	0.1/0.2[3]	mg/kg	6.6	-	0.2	0.2	<0.1	0.1	<0.1	0.1	<0.1	<0.1	0.2	0
Molybdenum	2	mg/kg	10	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nickel	2	mg/kg	50	-	34	31	19	19	14	28	16	15	16	23
Rubidium	2	mg/kg	-	-	12	10	8	8	3	15	12	8	5	11
Selenium	2	mg/kg	1	-	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***
Silver	0.5	mg/kg	20	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium	5	mg/kg	-	-	37	41	9	16	8	13	9	8	15	28
Thallium	0.1	mg/kg	1	-	0.1	0.1	0.2	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Tin	2	mg/kg	50	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Uranium	0.1	mg/kg	23	-	0.2	0.2	0.4	0.4	0.4	0.5	0.4	0.3	0.4	0.5
Vanadium	2	mg/kg	130	-	20	19	23	18	17	23	26	18	18	29
Zinc	5	mg/kg	200	-	44	39	44	45	81	140	44	170	120	120

Notes:

1 = CCME Canadian Soil Quality Guidelines (CSQGs) for a Residential/Parkland Site (CCME on-line 2014)

2 = SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

3 = Elevated RDL due to matrix interferences

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds applicable generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

Table 5-4 Results of Laboratory Analysis of Available Metals in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Parameters	RDL	Units	Generic Criteria[1]	SSTL[2]	2009 Sampling - Stantec									
					TP18-BS2	TP21-BS2	TP23-BS2	TP30-BS2	TP37-BS2	TP41-BS1	TP42-BS2	TP43-BS2	TP44-BS2	TP49-BS2
				Sample Depth (m)	1.3 - 1.4	0.9 - 1.0	0.5 - 0.6	1.2 - 1.3	1.3 - 1.4	0.6 - 0.8	1.3 - 1.5	1.5 - 1.7	1.7 - 1.9	0.8 - 1.1
Aluminum	10	mg/kg	-	-	9,000	8,800	7,100	6,600	5,400	7,100	7,300	8,000	6,000	8,800
Antimony	2	mg/kg	20	5	3	4	<2	<2	3	10	<2	<2	<2	<2
Arsenic	2	mg/kg	12	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Barium	5	mg/kg	500	-	68	93	25	29	26	61	43	44	14	28
Beryllium	2	mg/kg	4	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth	2	mg/kg	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron	5	mg/kg	-	-	10	13	<5	7	8	10	<5	14	<5	<5
Cadmium	0.3	mg/kg	10	1.3	0.8	1.4	0.6	1.5	<0.3	0.5	<0.3	2.9	<0.3	<0.3
Chromium	2	mg/kg	64	20	33	28	21	19	15	22	36	34	10	***65***
Cobalt	1	mg/kg	50	-	7	6	5	5	4	4	6	5	4	7
Copper	2	mg/kg	63	-	36	48	23	31	14	***77***	26	24	10	38
Iron	50	mg/kg	-	-	13,000	12,000	11,000	10,000	8,300	9,600	12,000	12,000	7,500	12,000
Lead	0.5	mg/kg	140	75	63	120	9.7	30	28	***580***	14	25	2.1	7.8
Lithium	2	mg/kg	-	-	11	10	9	7	6	9	10	8	5	7
Manganese	2	mg/kg	-	-	220	230	130	140	130	260	150	140	95	230
Mercury	0.1/0.2[3]	mg/kg	6.6	-	0.2	0.1	0.2	0.2	<0.1	0.1	<0.1	0.7	<0.1	0.1
Molybdenum	2	mg/kg	10	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nickel	2	mg/kg	50	-	22	19	13	14	15	13	21	21	10	34
Rubidium	2	mg/kg	-	-	13	13	8	7	5	7	14	9	4	5
Selenium	2	mg/kg	1	-	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***
Silver	0.5	mg/kg	20	-	<0.5	<0.5	6.0	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium	5	mg/kg	-	-	38	56	14	10	16	28	16	14	7	19
Thallium	0.1	mg/kg	1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Tin	2	mg/kg	50	-	<2	2	<2	<2	<2	2	<2	<2	<2	<2
Uranium	0.1	mg/kg	23	-	0.5	0.5	0.5	0.4	0.3	0.6	0.3	0.5	0.5	0.7
Vanadium	2	mg/kg	130	-	27	25	21	17	27	25	22	19	12	21
Zinc	5	mg/kg	200	-	***400***	***550***	98	160	100	170	46	180	26	34

Notes:

1 = CCME Canadian Soil Quality Guidelines (CSQGs) for a Residential/Parkland Site (CCME on-line 2014)

2 = SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

3 = Elevated RDL due to matrix interferences

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds applicable generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

Table 5-4 Results of Laboratory Analysis of Available Metals in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Parameters	RDL	Units	Generic Criteria[1]	SSTL[2]	2009 Sampling - Stantec									
					TP57-BS1	TP58-BS2	TP62-BS1	TP65-BS1	TP69-BS2	BS47	BS47 Lab-Dup	BS58	BS59	BS65
				Sample Depth (m)	0.4 - 0.5	0.9 - 1.0	0.5 - 0.6	0.0 - 0.2	1.3 - 1.4	0.0 - 0.10	0.0 - .0.10	0.0 - 0.20	0.0 - 0.20	0.0 - 0.15
Aluminum	10	mg/kg	-	-	7,700	13,000	4,800	7,300	5,700	8,200	7,900	5,600	5,600	4,600
Antimony	2	mg/kg	20	5	<2	8	4	4	7	4	4	<2	<2	<2
Arsenic	2	mg/kg	12	-	<2	<2	***76***	<2	<2	<2	<2	<2	<2	<2
Barium	5	mg/kg	500	-	42	110	***2,700***	230	26	140	130	17	13	24
Beryllium	2	mg/kg	4	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth	2	mg/kg	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron	5	mg/kg	-	-	15	5	26	<5	<5	35	28	<5	<5	6
Cadmium	0.3	mg/kg	10	1.3	0.7	1.3	2.7	0.4	0.6	1.1	1.0	<0.3	<0.3	1.9
Chromium	2	mg/kg	64	20	18	34	13	22	17	30	29	14	13	21
Cobalt	1	mg/kg	50	-	6	9	11	5	4	5	5	5	4	6
Copper	2	mg/kg	63	-	***100***	***66***	***130***	22	35	30	38	13	12	54
Iron	50	mg/kg	-	-	13,000	17,000	27,000	10,000	11,000	11,000	14,000	8,400	7,800	10,000
Lead	0.5	mg/kg	140	75	120	***210***	***840***	31	23	***320***	130	2.5	4.1	120
Lithium	2	mg/kg	-	-	8	16	3	7	4	12	13	7	6	7
Manganese	2	mg/kg	-	-	190	230	2,500	190	140	260	290	120	100	170
Mercury	0.1/0.2[3]	mg/kg	6.6	-	0.1	0.2	0.2	0.2	0.3	<0.1	<0.1	<0.1	<0.1	<0.2[2]
Molybdenum	2	mg/kg	10	-	<2	<2	3	<2	<2	<2	<2	<2	<2	<2
Nickel	2	mg/kg	50	-	14	23	18	15	12	19	18	16	12	18
Rubidium	2	mg/kg	-	-	6	19	4	9	3	11	11	5	4	4
Selenium	2	mg/kg	1	-	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***
Silver	0.5	mg/kg	20	-	<0.5	<0.5	5.8	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium	5	mg/kg	-	-	19	25	74	19	15	27	27	8	7	7
Thallium	0.1	mg/kg	1	-	<0.1	0.2	0.5	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1
Tin	2	mg/kg	50	-	6	9	3	<2	13	3	2	<2	<2	13
Uranium	0.1	mg/kg	23	-	0.4	0.5	0.9	0.6	0.2	0.5	0.6	0.5	0.5	0.2
Vanadium	2	mg/kg	130	-	26	30	18	19	15	19	18	15	14	14
Zinc	5	mg/kg	200	-	150	***270***	***310***	87	***350***	190	200	23	21	***820***

Notes:

1 = CCME Canadian Soil Quality Guidelines (CSQGs) for a Residential/Parkland Site (CCME on-line 2014)

2 = SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

3 = Elevated RDL due to matrix interferences

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds applicable generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

Table 5-4 Results of Laboratory Analysis of Available Metals in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Parameters	RDL	Units	Generic Criteria[1]	SSTL[2]	2009 Sampling - Stantec								
					BS78	BS84	BS92	BS101	BS103	BS265	MW2-SS1	MW4-SS1	Septic Tank
				Sample Depth (m)	0.0 - 0.10	0.0 - 0.10	0.0 - 0.12	0.0 - 0.12	0.0 - 0.15	0.0 - 0.15	0.0 - 0.5	0.0 - 0.5	0.0 - 0.5
Aluminum	10	mg/kg	-	-	5,700	12,000	6,300	4,800	8,200	6,400	7,400	9,100	5,400
Antimony	2	mg/kg	20	5	<2	5	<2	<2	<2	<2	3	<2	***25***
Arsenic	2	mg/kg	12	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Barium	5	mg/kg	500	-	36	85	10	18	16	90	240	24	37
Beryllium	2	mg/kg	4	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth	2	mg/kg	-	-	<2	<2	<2	<2	<2	<2	<2	<2	7
Boron	5	mg/kg	-	-	<5	40	<5	<5	<5	6	<5	<5	6
Cadmium	0.3	mg/kg	10	1.3	<0.3	1.8	1.8	0.3	0.6	<0.3	0.4	<0.3	5
Chromium	2	mg/kg	64	20	15	40	15	24	15	22	19	24	29
Cobalt	1	mg/kg	50	-	5	8	2	3	3	5	5	7	3
Copper	2	mg/kg	63	-	18	***2,200***	12	11	17	41	15	20	***87***
Iron	50	mg/kg	-	-	12,000	15,000	9,200	9,300	6,300	8,600	13,000	14,000	6,900
Lead	0.5	mg/kg	140	75	21	82	4.4	10	5.1	50	86	11	87
Lithium	2	mg/kg	-	-	7	15	3	5	5	5	14	9	5
Manganese	2	mg/kg	-	-	160	380	45	84	71	120	190	200	80
Mercury	0.1/0.2[3]	mg/kg	6.6	-	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.1	<0.1	1.8
Molybdenum	2	mg/kg	10	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nickel	2	mg/kg	50	-	13	26	5	12	11	13	10	25	15
Rubidium	2	mg/kg	-	-	5	18	2	7	3	8	28	4	4
Selenium	2	mg/kg	1	-	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***
Silver	0.5	mg/kg	20	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	***21***
Strontium	5	mg/kg	-	-	29	33	7	11	13	40	14	15	15
Thallium	0.1	mg/kg	1	-	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0.2	<0.1	<0.1
Tin	2	mg/kg	50	-	<2	6	<2	<2	<2	<2	<2	<2	***250***
Uranium	0.1	mg/kg	23	-	0.4	1.3	0.4	0.7	0.6	0.4	0.2	0.2	0.6
Vanadium	2	mg/kg	130	-	17	40	24	21	17	15	25	24	11
Zinc	5	mg/kg	200	-	***210***	***800***	28	42	35	42	71	42	***1,500***

Notes:

1 = CCME Canadian Soil Quality Guidelines (CSQGs) for a Residential/Parkland Site (CCME on-line 2014)

2 = SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

3 = Elevated RDL due to matrix interferences

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds applicable generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

Table 5-4 Results of Laboratory Analysis of Available Metals in Soil - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Parameters	RDL	Units	Generic Criteria[1]	SSTL[2]	2010 Sampling - Stantec				2013 Sampling - Stantec		
					MB-TP1 BS1	MB-TP2 BS1	MB-TP3 BS1	MB-TP4 BS1	13-POLW-BS2	13-POLW-BS4	13-POLW-BS9
				Sample Depth (m)	0.0 - 0.15	0.0 - 0.15	0.0 - 0.1	0.0 - 0.3	0.0 - 0.4	0.0 - 0.04	0.0 - 0.06
Aluminum	10	mg/kg	-	-	6,500	11,000	7,500	9,300	11,000	9,900	9,700
Antimony	2	mg/kg	20	5	<2	<2	<2	<2	<2.0	<2.0	<2.0
Arsenic	2	mg/kg	12	-	<2	<2	<2	<2	<2.0	<2.0	<2.0
Barium	5	mg/kg	500	-	24	68	46	55	53	52	79
Beryllium	2	mg/kg	4	-	<2	<2	<2	<2	<2.0	<2.0	<2.0
Bismuth	2	mg/kg	-	-	<2	<2	<2	<2	<2.0	<2.0	<2.0
Boron	5	mg/kg	-	-	<5	<5	<5	<5	<50	<50	<50
Cadmium	0.3	mg/kg	10	1.3	0.3	<0.3	<0.3	0.5	<0.30	<0.30	<0.30
Chromium	2	mg/kg	64	20	27	***100***	42	***78***	23	20	18
Cobalt	1	mg/kg	50	-	6	12	7	8	6.4	6.9	7.9
Copper	2	mg/kg	63	-	22	27	23	38	19	22	28
Iron	50	mg/kg	-	-	9,600	15,000	13,000	16,000	15,000	15,000	17,000
Lead	0.5	mg/kg	140	75	51	14	37	38	13	10	34
Lithium	2	mg/kg	-	-	8	12	11	14	11	12	14
Manganese	2	mg/kg	-	-	130	210	190	240	170	190	220
Mercury	0.1/0.2[3]	mg/kg	6.6	-	0.2	<0.1	<0.1	0.3	<0.10	<0.10	<0.10
Molybdenum	2	mg/kg	10	-	<2	<2	<2	<2	<2.0	<2.0	<2.0
Nickel	2	mg/kg	50	-	22	***81***	30	40	16	17	17
Rubidium	2	mg/kg	-	-	7	25	16	23	19	22	28
Selenium	2	mg/kg	1	-	<2	<2	<2	<2	<1.0	<1.0	<1.0
Silver	0.5	mg/kg	20	-	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50
Strontium	5	mg/kg	-	-	9	14	11	12	19	19	8.7
Thallium	0.1	mg/kg	1	-	<0.1	0.2	0.1	0.2	0.15	0.17	0.24
Tin	2	mg/kg	50	-	<2	<2	<2	<2	<2.0	<2.0	<2.0
Uranium	0.1	mg/kg	23	-	0.4	0.3	0.4	0.4	0.69	0.47	0.56
Vanadium	2	mg/kg	130	-	21	32	25	31	35	29	36
Zinc	5	mg/kg	200	-	65	98	***230***	***230***	37	35	44

Notes:

1 = CCME Canadian Soil Quality Guidelines (CSQGs) for a Residential/Parkland Site (CCME on-line 2014)

2 = SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

3 = Elevated RDL due to matrix interferences

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds applicable generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

Table 5-5 Results of Laboratory Analysis of TPH/BTEX in Groundwater - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Sample ID	BTEX Parameters				Total Petroleum Hydrocarbons					Reached Baseline at C_{32}?	Resemblence
	Benzene	Toluene	Ethyl-benzene	Xylenes	C_6-C_{10} (Gas Range)	C_{10}-C_{16} (Fuel Range)	C_{16}-C_{21} (Fuel Range)	C_{21}-C_{32} (Lube Range)	Modified TPH - Tier I[2]		
RDL	0.001	0.001	0.001	0.002	0.01	0.05		0.1	0.1	-	-
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	-
Criteria[1]	2.6	20	20	20	-	-	-	-	20	-	-
2009 Sampling - Stantec											
MW-2	<0.001	0.006	0.001	0.005	<0.01	0.2		0.2	0.4	-	WFO
MW-3	0.001	0.017	0.013	0.091	0.26	1.8		0.3	2.4	-	WFO, LO
MW-4	<0.001	<0.001	<0.001	<0.002	0.02	5.1		0.4	5.6	-	WFO
MW-4 Field-Dup	<0.001	0.005	0.002	0.012	0.35	3.0		0.2	3.5	-	WFO, UFO
MW-5	<0.001	0.003	<0.001	0.002	<0.01	1.1		0.3	1.5	-	WFO
MW-6	0.002	0.007	0.003	0.017	0.07	2.2		0.2	2.5	-	WFO
MW-14	0.003	0.009	0.034	0.039	0.48	4.3		0.2	5	-	G/FO
MW-66	<0.001	0.007	0.001	0.006	<0.01	0.15		<0.1	0.1	-	WFO
MW-67	<0.001	0.007	0.001	0.006	<0.01	<0.05		<0.1	<0.1	-	-
2013 Sampling - Stantec											
MW-7	<0.0010	<0.0010	<0.0010	<0.0020	<0.010	0.14	0.21	0.11	0.45	Yes	FO/LO

Notes:

1 = Partnership in RBCA (Risk-Based Corrective Action) Implementation (PIRI) Tier I Risk Based Screening Levels (RBSLs) for a residential site with non-potable groundwater and coarse grained soil, fuel oil impacts (July 2012)

2 = Modified TPH - Tier I does not include BTEX

Field-Dup = Field duplicate sample

RDL = Reportable Detection Limit for routine analysis

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Resemblance

WFO = Weathered fuel oil fraction

G/FO = One product in the gasoline/fuel oil range

UFO/LO = Unidentified compound in fuel oil range

LO = Lube oil fraction

FO/LO = One product in fuel oil/lube oil range

Table 5-6 Results of Laboratory Analysis of PCBs in Groundwater Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Location	Polychlorinated Biphenyls (PCBs)
RDL	0.05
Units	µg/L
Criteria[1]	7.8
2009 Sampling - Stantec	
MW1	<0.05
MW2	<0.05
MW13	<0.05
MW14	<0.05
MW66	<0.05
MW67	<0.05
2013 Sampling - Stantec	
MW7	<0.05

Notes:

1 =Ontario Ministry of the Environment (MOE) Groundwater Standards for Use Under Part XV.1 of the Environmental Protection Act (April 2011). Groundwater components for Table 3 - Generic Site Site Condition Standards in a Non-Potable Ground Water Condition.

RDL = Reportable Detection Limit

na = No applicable guideline

< # = Not detected above RDL noted

Table 5-7 Results of Laboratory Analysis of PAHs in Groundwater - Main Base
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Parameter	RDL	Units	Criteria[1]	2009 Sampling - Stantec	2013 Sampling - Stantec
				MW67	MW7
1-Methylnaphthalene	0.05	µg/L	1,800	<0.05	<0.05
2-Methylnaphthalene	0.05	µg/L	1,800	<0.05	<0.05
Acenaphthene	0.01	µg/L	600	<0.01	<0.01
Acenaphthylene	0.01	µg/L	1.8	<0.01	<0.01
Anthracene	0.05	µg/L	2.4	<0.05	<0.01
Benz[a]anthracene	0.01	µg/L	4.7	<0.01	<0.01
Benzo[a]pyrene	0.01	µg/L	0.81	<0.01	<0.01
Benzo[b]fluoranthene	0.01	µg/L	0.75	<0.01	<0.01
Benzo[ghi]perylene	0.01	µg/L	0.2	<0.01	<0.01
Benzo[k]fluoranthene	0.01	µg/L	0.4	<0.01	<0.01
Chrysene	0.01	µg/L	1	<0.01	<0.01
Dibenzo[a,h]anthracene	0.01	µg/L	0.52	<0.01	<0.01
Fluoranthene	0.01	µg/L	130	<0.01	<0.01
Fluorene	0.01	µg/L	400	<0.01	<0.01
Indeno[1,2,3-cd]pyrene	0.01	µg/L	0.2	<0.01	<0.01
Naphthalene	0.2	µg/L	1,400	<0.2	<0.2
Perylene	0.01	µg/L	-	<0.01	<0.01
Phenanthrene	0.01	µg/L	580	<0.01	<0.01
Pyrene	0.01	µg/L	68	<0.01	<0.01
Quinoline	0.05	µg/L	-	<0.05	-

Notes:

1 =Ontario Ministry of the Environment (MOE) Groundwater Standards for Use Under Part XV.1 of the Environmental Protection Act (April 2011). Groundwater components for Table 3 - Generic Site Site Condition Standards in a Non-Potable Ground Water Condition.

RDL = Reportable Detection Limit for routine analysis

Lab-dup = Laboratory duplicate sample

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds applicable generic criteria (i.e., MOE Standard)

6.0 MID-CANADA LINE

6.1 Site Description

The Mid-Canada Line site is located approximately 700 m southeast of the Main Base on top of a hill. The area formerly included a Mid-Canada Line antenna and small buildings. The concrete foundations from the former antenna and buildings currently remain in the area. The area also currently includes two fenced antennae and a communications trailer.

Terrain in the vicinity of Mid-Canada Line is moderately sloped and surface drainage (apparent groundwater flow direction) appears to be to in all directions, including to the west towards Pit No. 2. Vegetation in the area is limited and consists of patches of grasses and some low bushes. Bedrock and boulder outcroppings are common at Mid-Canada Line.

6.2 Description of Site Work

No additional delineation or remediation work was completed at Mid-Canada Line between 2011 and 2013. A visual site inspection was performed to refine the estimated depth of impacts. Photos were taken of each area requiring remediation for future planning purposes and are provided in Appendix 6B.

6.3 Summary of Environmental Concerns at Mid-Canada Line

Based on the recommendations of the Phase II/III ESA, HHERA and RAP/RMP prepared by Stantec in 2010, remediation of cadmium, chromium and lead impacted soil is recommended at Mid-Canada Line in order to obtain site-wide EPCs less than the applicable SSTLs. A summary of the estimated areas and volumes of soil requiring remediation is shown in Table 6.1. Depths of impacts were adjusted herein to more accurately reflect the average thickness of soil cover over bedrock.

Table 6.1 Summary of Soil Requiring Remediation – Mid-Canada Line

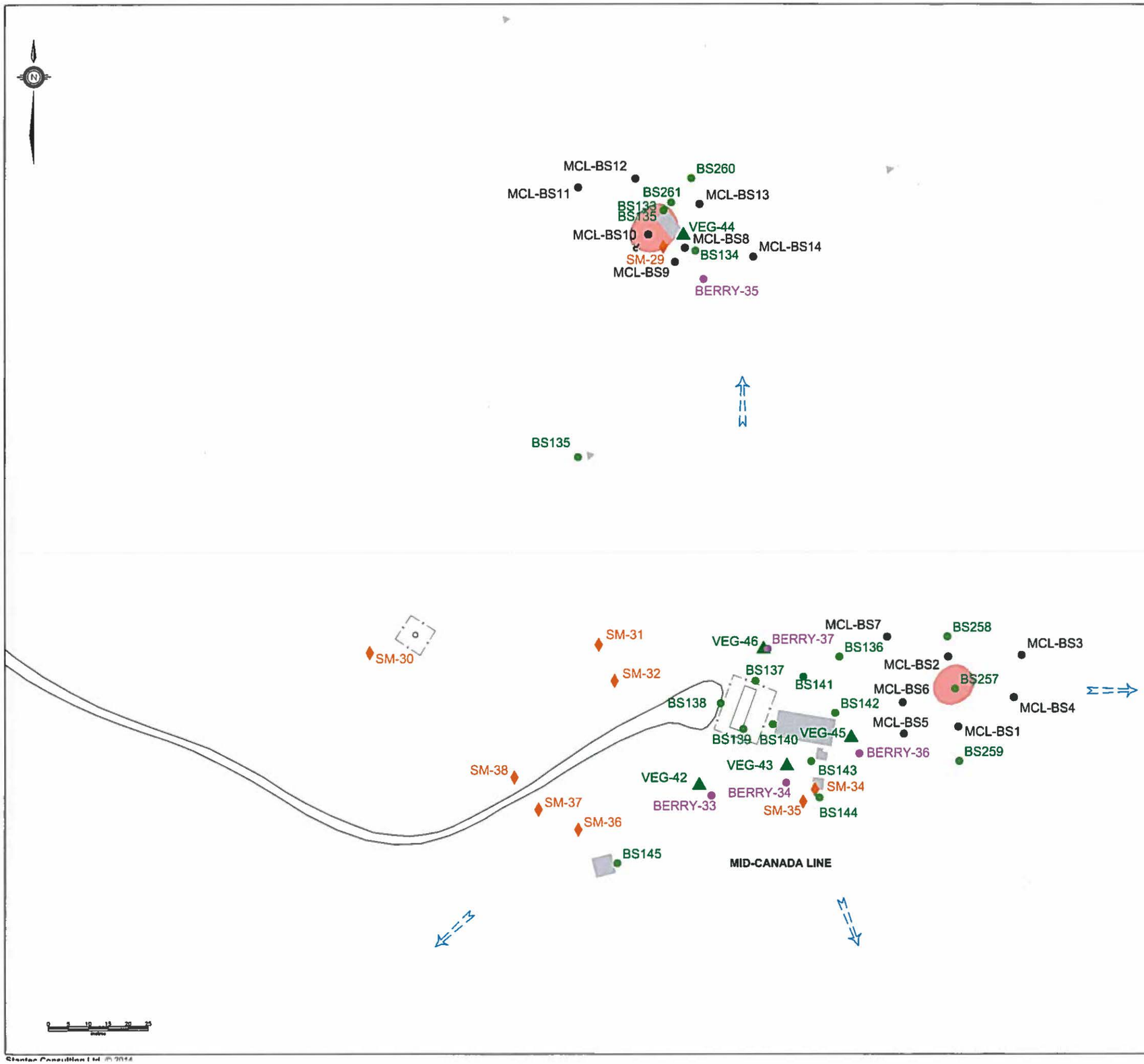
Remedial Objectives	Other Issues Identified[1]	Sample Locations	Area (m^2)	Depth (m)	Volume (m^3)	Fully Delineated?	Maximum Concentration (mg/kg)	Priority Level[2]
Cadmium, Chromium, Lead	Copper, Zinc	MCL-BS10, BS135	110	0.05	6	No	Cadmium: 12 Chromium: 1,200 Lead: 3,200 Copper: 210 Zinc: 22,000	4
Cadmium	-	BS257	75	0.05	4	Yes	Chromium: 64	4

Notes:
[1] Site data was screened against typical landfill acceptance criteria (1,000 mg/kg for TPH, 33 mg/kg and CCME Industrial guidelines for metals and PCBs). This information is required during the selection of disposal/treatment options. Exceedances of these values do not necessarily represent a risk to human or ecological health.
[2] Priority based on chemical of concern and location of impacts, with 1 being the highest priority and 4 being the lowest priority..

A site plan showing sample locations and the estimated area of soil requiring remediation is provided in Appendix 6A (Drawing No. 121411777.610-EE-06). Photos showing the areas requiring soil remediation are provided in Appendix 6B. A laboratory analytical summary table for COCs at Mid-Canada Line (i.e., metals) is provided in Appendix 6C.

APPENDIX 6A

Site Plan – Mid-Canada Line



LEGEND

- BULK SOIL SAMPLE (STANTEC 2010)
- BULK SOIL SAMPLE (STANTEC 2009)
- BERRY SAMPLE (STANTEC 2009)
- VEGETATION SAMPLE (STANTEC 2009)
- SMALL MAMMALS (STANTEC 2009)
- UNKNOWN EXTENT OF IMPACTS
- ESTIMATED AREA OF METALS (CADMIUM, CHROMIUM, AND LEAD) IMPACTED SOIL REQUIRING REMEDIATION
- CONCRETE FOUNDATION
- INFERRED GROUNDWATER FLOW DIRECTION

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

CLIENT:

NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF ENVIRONMENT
AND CONSERVATION

PROJECT TITLE:

ADDITIONAL DELINEATION AND UPDATED REMEDIAL ACTION PLAN, FORMER U.S. MILITARY SITE, HOPEDALE, NL

DRAWING TITLE:

SITE PLAN - MID-CANADA LINE

Stantec Consulting Ltd.

SCALE:	DATE:	REV No.
1:1000	JUNE 2, 2014	0
DRAWN BY:	EDITED BY:	CHECKED BY:
N.M.	-	AR
DRAWING No:	CAD FILE:	
121411777.610-EE-06	121411777_610-EE-06.DWG	

Stantec

APPENDIX 6B

Site Photos – Mid-Canada Line

Site Photos – Mid-Canada Line

Photo 1. Area of cadmium, chromium and lead-impacted soil requiring remediation (MCL-BS10 and BS135), looking north.

Photo 2. Area of cadmium, chromium and lead-impacted soil requiring remediation (MCL-BS10 and BS135), looking west.

Site Photos – Mid-Canada Line

Photo 3. Area of cadmium-impacted soil requiring remediation (BS257), looking southwest.

Photo 4. Area of cadmium-impacted soil requiring remediation (BS257), looking southwest.

APPENDIX 6C

Analytical Summary Tables – Mid-Canada Line

Table 6-1 Results of Laboratory Analysis of Available Metals in Soil - Mid-Canada Line
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Parameters	RDL	Units	Generic Criteria[1]	SSTL[2]	2009 Sampling - Stantec										
					BS135	BS139	BS140	BS142	BS144	BS145	BS257	BS258	BS259	BS260	BS261
				Sample Depth (m)	0.0 - 0.10	0.0 - 0.05	0.0 - 0.05	0.0 - 0.07	0.0 - 0.10	0.0 - 0.05	0.0 - 0.15	0.0 - 0.15	0.0 - 0.15	0.0 - 0.15	0.0 - 0.15
Aluminum	10	mg/kg	-	-	7,900	4,700	2,100	6,500	3,900	3,700	10,000	2,800	10,000	7,000	6,200
Antimony	2	mg/kg	20	5	<2	<2	5	2	<2	<2	<2	<2	<2	<2	2
Arsenic	2	mg/kg	12	-	4	2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Barium	5	mg/kg	500	-	32	25	17	52	36	13	9	18	21	36	33
Beryllium	2	mg/kg	4	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth	2	mg/kg	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron	5	mg/kg	-	-	<5	<5	<5	5	<5	<5	<5	<5	<5	<5	<5
Cadmium	0.3	mg/kg	10	1.3	***13***	4.9	<0.3	0.7	<0.3	<0.3	<0.3	<0.3	<0.3	0.5	1.9
Chromium	2	mg/kg	64	20	***1,200***	15	12	23	14	21	64	6	27	10	23
Cobalt	1	mg/kg	50	-	11	4	5	4	3	3	2	1	4	1	2
Copper	2	mg/kg	63	-	***210***	10	***140***	59	43	21	3	8	9	9	***130***
Iron	50	mg/kg	-	-	15,000	9,200	6,900	8,700	8,500	7,100	33,000	3,200	12,000	4,200	9,300
Lead	0.5	mg/kg	140	75	***3,200*** (5)	16	57	***440***	24	11	4.1	6.0	7.8	8.9	82
Lithium	2	mg/kg	-	-	10	8	3	10	7	5	3	<2	13	2	5
Manganese	2	mg/kg	-	-	270	130	78	250	85	59	25	8	83	22	67
Mercury	0.1	mg/kg	6.6	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	0.1	0.1
Molybdenum	2	mg/kg	10	-	***81***	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nickel	2	mg/kg	50	-	14	14	13	14	11	14	10	4	14	4	14
Rubidium	2	mg/kg	-	-	6	4	3	13	11	6	4	2	9	2	8
Selenium	2	mg/kg	1	-	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***<2***	***2***
Silver	0.5	mg/kg	20	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium	5	mg/kg	-	-	64	11	<5	31	<5	<5	<5	9	5	<5	8
Thallium	0.1	mg/kg	1	-	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	2	mg/kg	50	-	2	<2	23	4	<2	<2	<2	<2	<2	<2	<2
Uranium	0.1	mg/kg	23	-	0.6	0.2	0.1	0.7	0.2	0.2	1.4	0.5	0.6	2.5	1.3
Vanadium	2	mg/kg	130	-	19	13	8	19	12	17	39	5	27	13	17
Zinc	5	mg/kg	200	-	***22,000***	84	***470***	***450***	110	44	10	28	34	26	57

Notes:

1 = CCME Canadian Soil Quality Guidelines (CSQGs) for a Residential/ Parkland Site (CCME on-line, 2014)

2 = SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

RDL = Reportable Detection Limit for routine analysis

(#) = Elevated RDL shown in brackets

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds applicable generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTLcalculated for metals at the Former Radar Site (Stantec, 2010)

Table 6-1 Results of Laboratory Analysis of Available Metals in Soil - Mid-Canada Line
Additional Delineation and Updated Remedial Action Plan
Former U.S. Military Site, Hopedale, Labrador
Project No. 121411777.610

Parameters	RDL	Units	Generic Criteria[1]	SSTL[2]	2010 Sampling - Stantec								
					MCL-BS1-10	MCL-BS2-10	MCL-BS4-10	MCL-BS6-10	MCL-BS8-10	MCL-BS8-10 Lab-Dup	MCL-BS10-10	MCL-BS12-10	MCL-BS13 10
				Sample Depth (m)	0.0 - 0.15	0.0 - 0.2	0.0 - 0.15	0.0 - 0.15	0.0 - 0.2	0.0 - 0.2	Not recorded		
Aluminum	10	mg/kg	-	-	5,100	2,000	2900	4,600	4,100	3,900	3,100	4,000	3,500
Antimony	2	mg/kg	20	5	<2	<2	<2	9	<2	<2	<2	<2	2
Arsenic	2	mg/kg	12	-	<2	<2	<2	<2	<2	2	<2	<2	<2
Barium	5	mg/kg	500	-	17	10	12	88	99	100	21	16	25
Beryllium	2	mg/kg	4	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth	2	mg/kg	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron	5	mg/kg	-	-	<5	<5	<5	10	<5	<5	<5	<5	<5
Cadmium	0.3	mg/kg	10	1.3	<0.3	<0.3	<0.3	5.1	4	4.7	9	0.4	2.2
Chromium	2	mg/kg	64	20	23	11	13	25	30	33	4	11	45
Cobalt	1	mg/kg	50	-	2	<1	1	3	4	5	2	2	1
Copper	2	mg/kg	63	-	7	49	4	***210***	***320***	***200***	31	22	33
Iron	50	mg/kg	-	-	12,000	3,300	5900	7,600	10,000	11,000	5,400	6,000	5,500
Lead	0.5	mg/kg	140	75	7.4	46	6	***310***	83	87	5	19	100
Lithium	2	mg/kg	-	-	4	<2	<2	7	9	8	2	3	<2
Manganese	2	mg/kg	-	-	45	14	22	68	220	280	28	40	21
Mercury	0.1	mg/kg	6.6	-	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.1
Molybdenum	2	mg/kg	10	-	<2	<2	<2	<2	2	<2	<2	<2	<2
Nickel	2	mg/kg	50	-	10	3	4	21	8	8	2	4	3
Rubidium	2	mg/kg	-	-	14	4	7	10	5	5	7	6	3
Selenium	2	mg/kg	1	-	***<5***	***<5***	***<5***	***<5***	***<5***	***<5***	***<5***	***<5***	***<5***
Silver	0.5	mg/kg	20	-	<0.5	<0.5	<0.5	3.8	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium	5	mg/kg	-	-	<5	<5	<5	8	<5	5	<5	10	54
Thallium	0.1	mg/kg	1	-	0.2	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Tin	2	mg/kg	50	-	<2	<2	<2	***62***	<2	<2	<2	<2	<2
Uranium	0.1	mg/kg	23	-	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.8	0.9
Vanadium	2	mg/kg	130	-	23	9	12	13	12	13	11	14	8
Zinc	5	mg/kg	200	-	20	29	12	***260***	96	110	17	31	100

Notes:

1 = CCME Canadian Soil Quality Guidelines (CSQGs) for a Residential/ Parkland Site (CCME on-line, 2014)

2 = SSTL calculated for metals at the Former Radar Site (Stantec, 2010)

RDL = Reportable Detection Limit for routine analysis

(#) = Elevated RDL shown in brackets

< # = Not detected above RDL noted

"-" = indicates value is not available or does not apply

Bold/Italics = Value exceeds applicable generic criteria (i.e., CCME CSQG)

Shaded = Value exceeds SSTLcalculated for metals at the Former Radar Site (Stantec, 2010)