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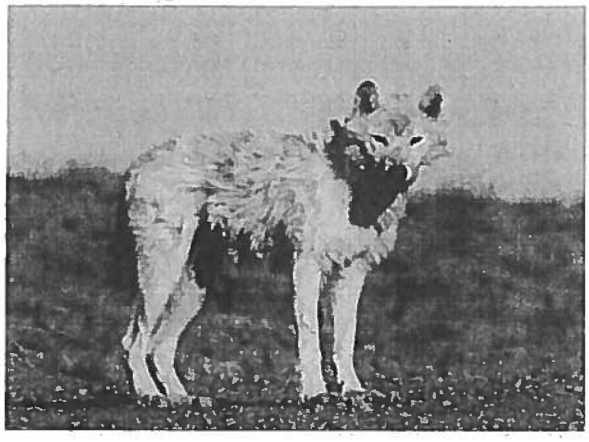
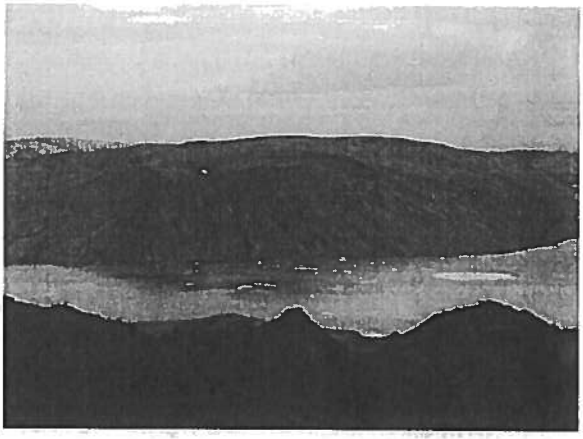
DETAILED CHARACTERIZATION AND ECONET UPDATE OF MULTIPLE SITES AT CFS-EUREKA AND CFS-ALERT, NUNAVUT
Volume III – CFS-EUREKA

Final Report 2007/08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March 31, 2008

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4.6 S-10527 NORTH AIRSTRIP APRON

4.6.1 Location and Site Description

The North Airstrip Apron is located on the northwest side of the airstrip runway (Figure 9). This area contains 4 aboveground diesel fuel storage tanks installed in 1999 to replace 2 diesel fuel bladders of 90,000 L capacity (Photograph 15, Appendix A). The diesel tanks are currently not surrounded by berms. During the 2006/07 and 2007/08 sampling campaigns, 2 fuel bladders were still on-site located adjacent to, and north of the new fuel tanks. A fuel pump and hoses were also present on this site, and several barrels were temporarily stored on the site.

During the 2006/07 campaign, several trenches were noted on site, suggesting that soil samples were recently collected. Also, during this campaign, the bladders appeared to be in active use as transfer hoses were seen to be attached. DND has indicated that the location of the 4 diesel fuel storage tanks is likely to changed in the near future.

The topography of the site is mainly level and the soil is composed of clay and silt. A pool of standing water was noted in 2006/07 and 2007/08, but no drainage pathway was recorded on site. The North Airstrip Apron site is located approximately 1,100 m from Slidre Fiord.

4.6.2 Summary of Previous BRI Investigations

In 2006/07, 10 soil samples, including 1 duplicate pair, were collected at various depths and were analyzed for TPH and BTEX. The samples were collected on the south edge of the site, downgradient from the diesel fuel tanks. Each soil sample contained a variety of petroleum hydrocarbons at concentrations exceeding the applicable CCME guidelines (Table 12). Concentrations of TPH Fractions 1 and 2 above CCME guidelines were detected in 9 and 10 samples, respectively. Significant benzene concentrations, 1,900 times above CCME guidelines, were measured in 1 soil sample. Toluene, ethylbenzene and total xylene concentrations above the CCME guidelines were found in 4, 6, and 6 soil samples, respectively.

Table 12. (S-10527) Previous contaminated soil samples.

Sample Name	Sample Type	Depth (cm)	Contaminant	Guideline (mg/kg)	Concentration (mg/kg)
06NA0115	SOIL	15-20	TOLUENE	0.37	0.40
	SOIL	15-20	ETHYLBENZENE	0.08	0.5
	SOIL	15-20	TOTAL XYLENE	11	18
	SOIL	15-20	TPH / F1	310	1,400
	SOIL	15-20	TPH / F2	760	6,100
06NA0116	SOIL	15-20	ETHYLBENZENE	0.08	1.2
	SOIL	15-20	TOTAL XYLENE	11	20
	SOIL	15-20	TPH / F1	310	2,200
	SOIL	15-20	TPH / F2	760	8,900
06NA0117	SOIL	50	BENZENE	0.03	59
	SOIL	50	TOLUENE	0.37	350
	SOIL	50	ETHYLBENZENE	0.08	91
	SOIL	50	TOTAL XYLENE	11	730
	SOIL	50	TPH / F1	310	9,000
	SOIL	50	TPH / F2	760	9,200
06NA0118	SOIL	15	TPH / F1	310	1,800
	SOIL	15	TPH / F2	760	10,000
06NA0119	SOIL	0-10	ETHYLBENZENE	0.08	1.2
	SOIL	0-10	TOTAL XYLENE	11	20
	SOIL	0-10	TPH / F1	310	680
	SOIL	0-10	TPH / F2	760	2,100
06NA0120	SOIL	0-10	TPH / F2	760	2,300
06NA0122	SOIL	0-10	TPH / F1	310	450
	SOIL	0-10	TPH / F2	760	4,000
06NA0123	SOIL	0-10	TPH / F1	310	480
	SOIL	0-10	TPH / F2	760	2,400
06NA0124	SOIL	40	TOLUENE	0.37	1.5
	SOIL	40	ETHYLBENZENE	0.08	8.7
	SOIL	40	TOTAL XYLENE	11	61
	SOIL	40	TPH / F1	310	2,400
	SOIL	40	TPH / F2	760	6,500

4.6.3 Nature and Extent of Contamination

In 2007/08, 25 subsurface soil samples, including 1 duplicate pair, were collected and analyzed for TPH, BTEX and PAHs (Table 13) (Photographs 16 to 18, Appendix A). TPH Fractions 1, 2 and 3 at concentrations above the CCME guidelines were measured in 12, 11 and 1 soil sample, respectively. Benzene, toluene, ethylbenzene and total xylene concentrations exceeding the CCME guidelines were detected in 5, 3, 10 and 5 soil samples, respectively. PAHs were detected in 10 soil samples, but only naphthalene in one sample was above the CCME guidelines. The results indicated the presence of 2 to 3 hydrocarbon contaminated areas. These areas were located between the 4 diesel fuel storage tanks and the airstrip.

The FCSAP classification based on the above results classifies the North Airstrip Apron as a Class 1 site with a score of 80.5. The estimated volume of contaminated soil is 1,755 m^3. This indicates that action is required to address the contamination on site.

4.6.4 Recommendations

The area surrounding the existing fuel storage tanks and bladders was sampled and TPH contamination was detected in the area between the fuel tanks and the airstrip. The contamination appears to be divided into 2 to 3 areas. The majority of the contamination was TPH Fractions 1 and 2, with several sites having some or all components of BTEX above the CCME guidelines. TPH Fraction 3 and PAH (naphthalene) contamination was detected in 1 sample for each contaminant (2 samples total).

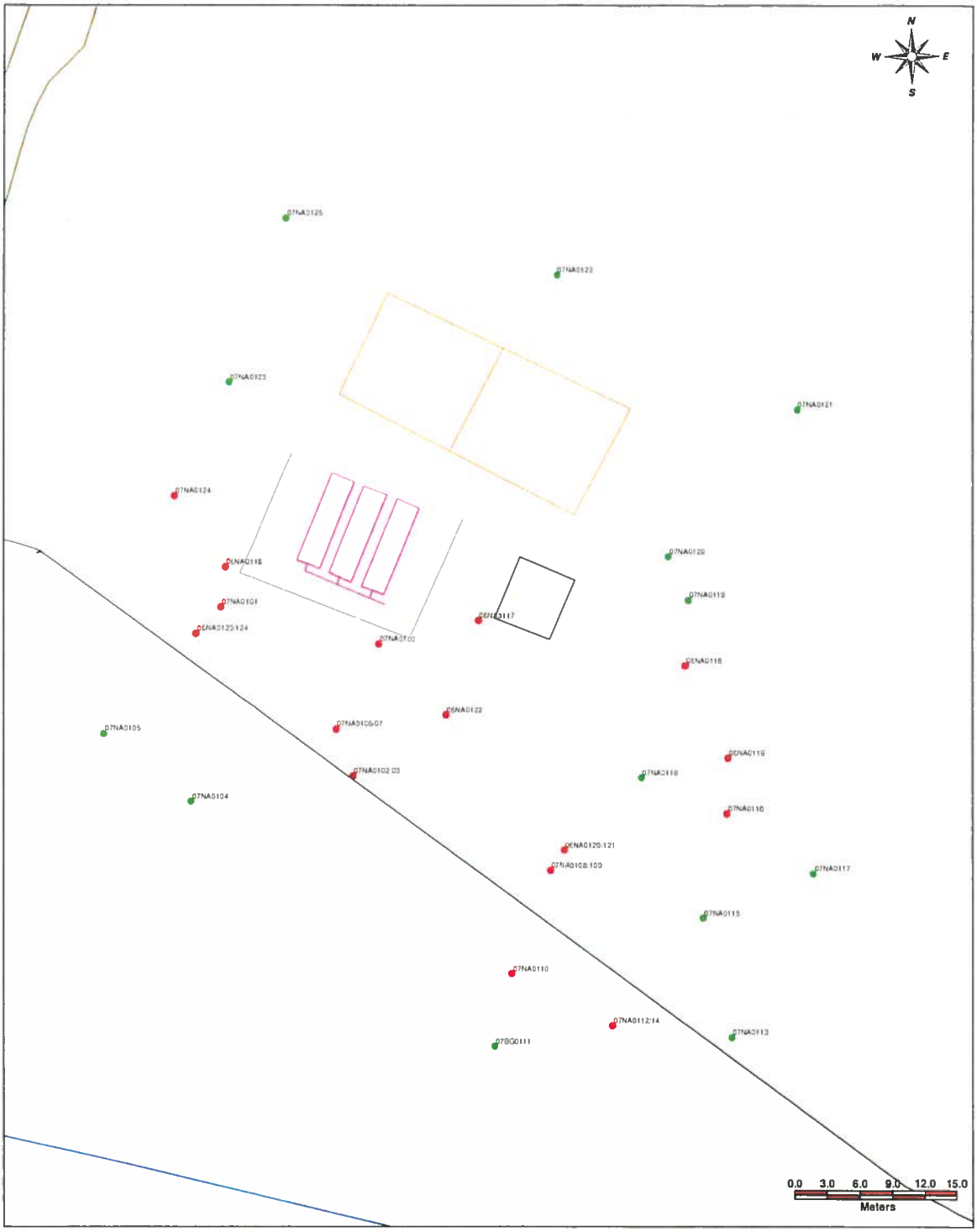
The current location of the fuel storage tanks may change, in which case treatment should be delayed until all modifications at the site are completed. This would enable a single treatment program vs. multiple smaller programs.

Addressing the contamination at this site will require careful coordination as this area is in frequent use by both light (eg. Twin Otter) and heavy (C-130 Hercules) aircraft for refueling. The most appropriate approach is the excavation of the contaminated soil followed by immediate

back-filling to minimize thawing of the permafrost. The excavated soil would then be treated in an *ex situ* biopile with nutrient amendments.

NORTH AIRSTRIP APRON (S-10527)

SAMPLES COLLECTED 2006-2008 / CFS-EUREKA
CHARACTERIZATION OF CONTAMINATED SITES



Legend

- Uncontaminated sample
- Contaminated sample
- Area
- Buildings
- P.O.L. Line / tanks
- Line / road
- Runway
- Debris area
- Bladder

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FIGURE 9

DRAWN BY : JOSEE SIROIS
VERIFIED BY : DAVID JUCK
DATE : 7 FEBRUARY, 2008
REVISION : 0

Table 13. (S-10527) North Airstrip Apron 2007/08 results.

	PARAMETERS	UNITS	SOIL INDUSTRIAL GUIDELINE (Course)	SOIL DETECTION LIMIT	North Airstrip Apron (S-10527) SOIL 07NA0100 130 cm 7/27/2007	07NA0101 130 cm 7/27/2007	07NA0102 90 cm 7/27/2007	07NA0103 30 cm 7/27/2007	07NA0104 90 cm 7/27/2007	07NA0105 90 cm 7/27/2007	07NA0106 Dup 107 70 cm 7/27/2007	07NA0107 70 cm 7/27/2007	07NA0108 60 cm 7/27/2007	07NA0109 110 cm 7/27/2007	07NA0110 105 cm 7/27/2007	07NA0112 110 cm 7/27/2007
TPH	Benzene	mg/kg	0.03	0.02	6.4	4.0	2.5	<0.1	<0.1	<0.1	2.5	0.5	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.37	0.02	48.2	12.6	13.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1
	Ethylbenzene	mg/kg	0.082	0.02	17.1	4.8	7.7	<0.1	<0.1	<0.1	3.7	2.2	4.6	1.5	7.0	0.2
	Total Xylene	mg/kg	11	0.04	85.6	31.2	44.6	0.4	<0.1	<0.1	6.4	4.8	28.9	10.8	72.5	1.5
	F1 (C6-C10)	mg/kg	310	10	2,470	989	1,350	361	25	11	542	859	733	258	1,030	654
	F2 (C10-C16)	mg/kg	760	10	1,560	34.2	812	2,700	6.4	5.5	4,190	11,200	7,410	1,590	5,700	6,000
	F3 (C16-C34)	mg/kg	1,700	10	509	200	378	249	95	74.9	1,030	3,140	367	212	398	388
	F4 (C34-C50)	mg/kg	3,300	10	61	66	74.9	71.4	49	48	79.8	40	42	64.7	70.5	90

	PARAMETERS	UNITS	SOIL INDUSTRIAL GUIDELINE (Course)	SOIL DETECTION LIMIT	SOIL 07NA0113 90 cm 7/27/2007	07NA0114 110 cm 7/27/2007	07NA0115 90 cm 7/27/2007	07NA0116 90 cm 7/27/2007	07NA0117 90 cm 7/27/2007	07NA0118 65 cm 7/27/2007	E07NA0119 80 cm 27/07/2007	07NA0120 80 cm 7/27/2007	07NA0121 90 cm 7/27/2007	07NA0122 80 cm 7/27/2007	07NA0123 90 cm 7/27/2007	07NA0124 90 cm 7/27/2007	07NA0125 90 cm 7/27/2007
TPH	Benzene	mg/kg	0.03	0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<3.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.37	0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Ethylbenzene	mg/kg	0.082	0.02	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	117	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Total Xylene	mg/kg	11	0.04	<0.1	1.6	<0.1	0.2	<0.1	<0.1	29	<0.1	<0.1	<0.1	<0.1	1.00	<0.1
	F1 (C6-C10)	mg/kg	310	10	5	462	8.5	901	4	5.2	<0.1	<3.5	<4.2	<5.2	<3.2	163	<4.3
	F2 (C10-C16)	mg/kg	760	10	<2.3	2,000	5.1	5,580	<2.3	2.8	<0.1	2.4	4.2	4.7	<1.9	185	3.1
	F3 (C16-C34)	mg/kg	1,700	10	180	209	73.1	338	78.4	101	<0.1	79.7	113	144	107	79.8	124
	F4 (C34-C50)	mg/kg	3,300	10	94.1	39	24	32	25	27	<0.1	26	25	32	29	22	28

NA Not available
Higher than the criteria

CANADIAN COUNCIL OF MINISTERS OF THE ENVIRONMENT (CCME)
SOIL Following the Canadian Soil Quality Guidelines for the Protection of Human and/or Environmental Health in Industrial land uses, of the CCME. (2006)
F1-F4 Following the Technical Supplement of the Petroleum Hydrocarbons (PHCs) in soil (Industrial/Eco Soil Contact), endorsed by the CCME. (January 2001)

Table 13. (S-10527) North Airstrip Apron 2007/08 results (cont.).

	PARAMETERS	SOIL			North Airstrip Apron (S-10527)												
					SOIL												
		UNITS	INDUSTRIAL GUIDELINES (Coarse)	DETECTION LIMIT	07NA0100 130 cm 7/27/2007	07NA0101 130 cm 7/27/2007	07NA0102 90 cm 7/27/2007	07NA0103 30 cm 7/27/2007	07NA0104 90 cm 7/27/2007	07NA0105 90 cm 7/27/2007	07NA0106 70 cm dup 107 7/27/2007	07NA0107 70 cm 7/27/2007	07NA0108 60 cm 7/27/2007	07NA0109 110 cm 7/27/2007	07NA0110 105 cm 7/27/2007	07NA0112 110 cm 7/27/2007	07NA0113 90 cm 7/27/2007
PAH	Naphthalene	mg/kg	22	0.008	1.3	<0.1	0.2	<0.1	<0.1	<0.1	7.4	12.4	16.5	2.9	17.7	9.3	<0.1
	2-methylnaphthalene	mg/kg	---	0.005	2.4	<0.1	0.2	<0.1	<0.1	<0.1	30.3	49.2	77.3	4.8	32.9	16	<0.1
	1-methylnaphthalene	mg/kg	---	0.005	1.4	<0.1	0.1	<0.1	<0.1	<0.1	23.9	33.5	44.4	2.7	19.4	9.7	<0.1
	1,3-Dimethylnaphthalene	mg/kg	---	0.005	4.9	<0.1	0.6	<0.1	<0.1	<0.1	32.4	37.8	34.7	2.2	16.6	8.1	<0.1
	Acenaphthylene	mg/kg	---	0.004	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.4	0.4	<0.1	0.2	<0.1	<0.1
	Acenaphthene	mg/kg	---	0.004	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	1.1	1.5	1.2	<0.1	0.6	0.3	<0.1
	2,3,5-trimethylnaphthalene	mg/kg	---	0.007	1.1	<0.1	0.1	<0.1	<0.1	<0.1	5	6.8	3.4	0.1	1	0.5	<0.1
	Fluorene	mg/kg	---	0.007	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	2	2.7	0.7	<0.1	0.5	0.2	<0.1
	Phenanthrene	mg/kg	50	0.01	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.7	1	0.2	<0.1	0.2	<0.1	<0.1
	Anthracene	mg/kg	---	0.004	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Fluoranthene	mg/kg	---	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Pyrene	mg/kg	100	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo(c)Phenanthrene	mg/kg	---	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo(a)Anthracene	mg/kg	10	0.007	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Chrysene	mg/kg	---	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	[illegible]	mg/kg	---	0.005	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo(b,j,k)fluoranthene	mg/kg	10	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.7	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	3-methylcholanthrene	mg/kg	---	0.022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Indeno(1,2,3-cd)pyrene	mg/kg	10	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Dibenzo(a,h)anthracene	mg/kg	10	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo(g,h,i)perylene	mg/kg	---	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Dibenzo (a,l) pyrene	mg/kg	---	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Dibenzo (a,i) pyrene	mg/kg	---	0.007	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Dibenzo (a,h) pyrene	mg/kg	---	0.008	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

NA Not available
Higher than the criteria

CANADIAN COUNCIL OF MINISTERS OF THE ENVIRONMENT (CCME)
SOIL Following the Canadian Soil Quality Guidelines for the Protection of Human and/or Environmental Health in Industrial land uses, of the CCME (2006)

Table 13. (S-10527) North Airstrip Apron 2007/08 results (cont.).

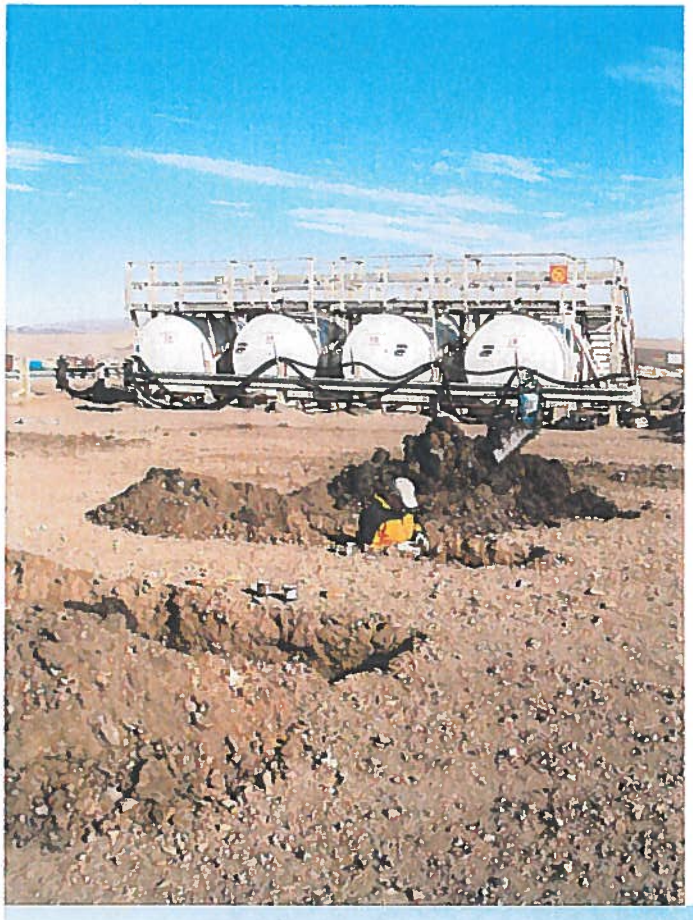
	PARAMETERS	SOIL UNITS	SOIL INDUSTRIAL GUIDELINES (Coarse)	SOIL DETECTION LIMIT	SOIL 07NAB114 110 cm 7/27/2007	07NAB115 90 cm 7/27/2007	07NAB116 90 cm 7/27/2007	07NAB117 90 cm 7/27/2007	07NAB118 60 cm 7/27/2007	07NAB120 20 cm 7/27/2007	07NAB121 20 cm 7/27/2007	07NAB122 20 cm 7/27/2007	07NAB123 50 cm 7/27/2007	07NAB124 90 cm 7/27/2007	07NAB125 90 cm 7/27/2007
PAH	Naphthalene	mg/kg	22	0.003	2.5	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	2-methylnaphthalene	mg/kg	---	0.005	5.2	<0.1	1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
	1-methylnaphthalene	mg/kg	---	0.005	3	<0.1	2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	1,3-Dimethylnaphthalene	mg/kg	---	0.005	2.3	<0.1	3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Acenaphthylene	mg/kg	---	0.004	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Acenaphthene	mg/kg	---	0.004	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	2,3,5-trimethylnaphthalene	mg/kg	---	0.007	0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Fluorene	mg/kg	---	0.007	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Phenanthrene	mg/kg	50	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Anthracene	mg/kg	---	0.004	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Fluoranthene	mg/kg	---	0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Pyrene	mg/kg	100	0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo(c)Phenanthrene	mg/kg	---	0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo(a)Anthracene	mg/kg	10	0.007	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Chrysene	mg/kg	---	0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	7,12-Dimethylbenz[a]anthracene	mg/kg	---	0.006	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo(b,j,k)fluoranthene	mg/kg	10	0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.7	0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	3-methylcholanthrene	mg/kg	---	0.022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Indeno(1,2,3-cd)pyrene	mg/kg	10	0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Dibenzo(a,h)anthracene	mg/kg	10	0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo(g,h,i)perylene	mg/kg	---	0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Dibenzo (a,l) pyrene	mg/kg	---	0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
	Dibenzo (a,i) pyrene	mg/kg	---	0.007	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Dibenzo (a,h) pyrene	mg/kg	---	0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

NA Not available
Higher than the criteria

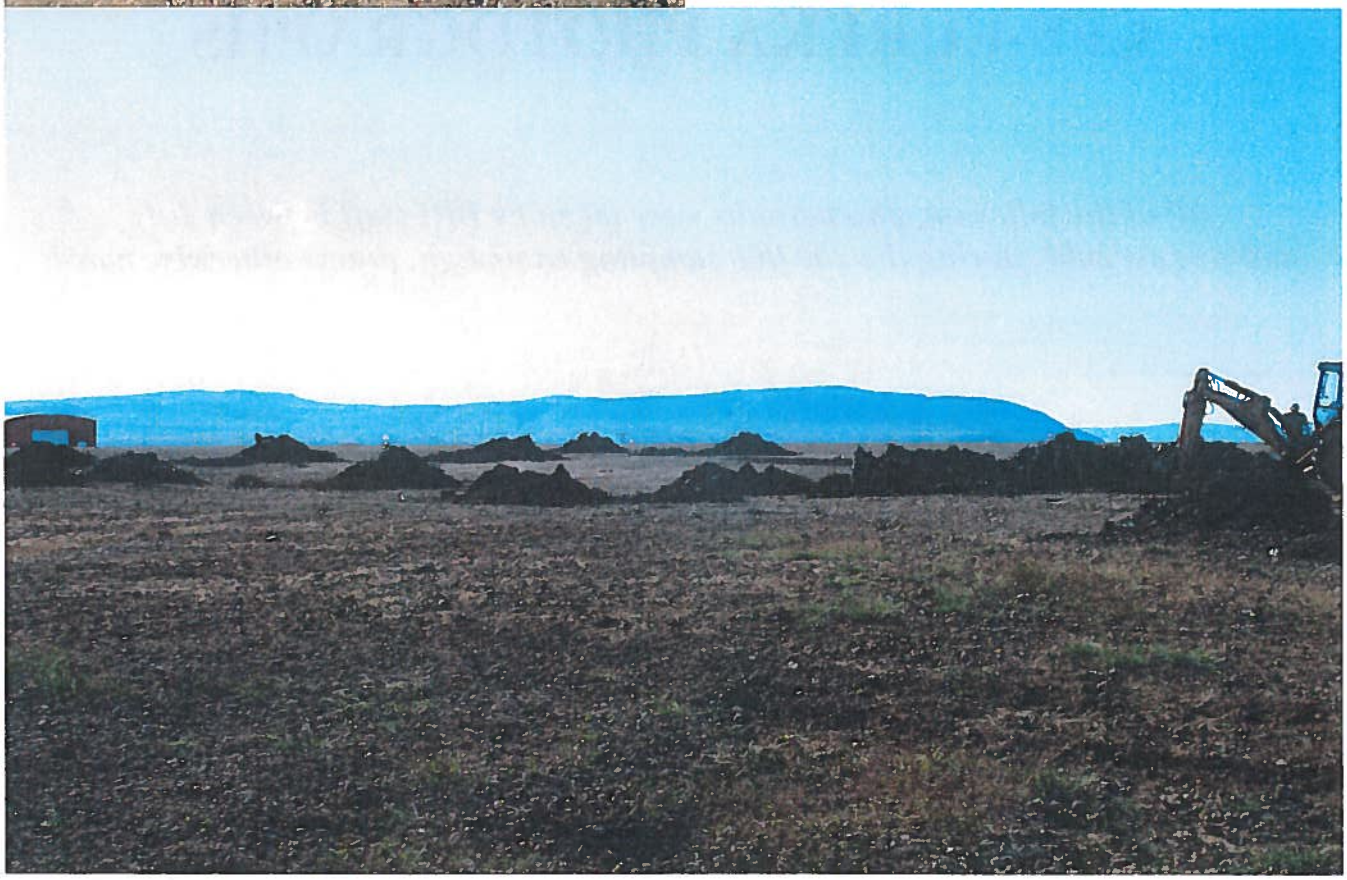
CANADIAN COUNCIL OF MINISTERS OF THE ENVIRONMENT (CCME)
SOIL Following the Canadian Soil Quality Guidelines for the Protection of Human and/or Environmental Health in Industrial land uses, of the CCME (2006)

CFS-EUREKA PHOTOGRAPHS

All of the following photographs were taken by BRI staff between July and August 2007, during the 2007/08 sampling campaign, unless otherwise noted.



Photograph 15. (North Airstrip Apron, S-10527) Trenches dug in front of the refuelling tanks.



Photograph 16. (North Airstrip Apron, S-10527) Delineated area located south of the 4 tanks.

Photograph 17. (North Airstrip Apron, S-10527) Another view of trenches delineating the east edge of the contaminated area.

Photograph. 18. (North Airstrip Apron, S-10527) View of the east edge of the contaminated area from the runway.

VI. S-10527 NORTH AIRSTRIP APRON

SAMPLE NUMBER : **B07-NA-0100**
MATRIX : Soil
DESCRIPTION : Silty clay with trace of sand, strong fuel odor, depth 130 cm, permafrost at 130 cm.
LOCATION : Southeast of the tanks.

SAMPLE NUMBER : **B07-NA-0101**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 130 cm, permafrost at 130 cm.
LOCATION : Southwest of the tanks.

SAMPLE NUMBER : **B07-NA-0102**
MATRIX : Soil
DESCRIPTION : Silty clay with trace of sand, light fuel odor, depth 90 cm, permafrost at 130 cm.
LOCATION : Few meters southeast of the tanks.

SAMPLE NUMBER : **B07-NA-0103**
MATRIX : Soil
DESCRIPTION : Sand with trace of clay, no odor, depth 30 cm, permafrost at 130 cm.
LOCATION : Few meters southeast of the tanks.

SAMPLE NUMBER : **B07-NA-0104**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 90 cm, permafrost at 130 cm.
LOCATION : Few meters southwest of the tanks.

SAMPLE NUMBER : **B07-NA-0105**
MATRIX : Soil
DESCRIPTION : Silt clay, no odor, depth 90 cm, permafrost at 130 cm.
LOCATION : Few meters southwest of the tanks, +/- 40 m. north of the runway.

SAMPLE NUMBER : **B07-NA-0106/107**
MATRIX : Soil
DESCRIPTION : Silty clay with trace of sand, moderate fuel odor, depth 70 cm, permafrost at 130 cm.
LOCATION : Few meters southeast of the tanks.

SAMPLE NUMBER : **B07-NA-0108**
MATRIX : Soil
DESCRIPTION : Compact silty clay, moderate fuel odor, depth 60 cm, permafrost at 130 cm.
LOCATION : Few meters south of the shed located east side of the tanks.

SAMPLE NUMBER : **B07-NA-0109**
MATRIX : Soil
DESCRIPTION : Compact silty clay, moderate fuel odor, depth 110 cm, permafrost at 130 cm.
LOCATION : Few meters south of the shed located east side of the tanks.

SAMPLE NUMBER : **B07-NA-0110**
MATRIX : Soil
DESCRIPTION : Compact silty clay, moderate to strong fuel odor, depth 105 cm, permafrost at 130 cm.
LOCATION : Few meters south of the shed located east side of the tanks, few meters north of the runway.

SAMPLE NUMBER : **B07-NA-0111 BG**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 90 cm, permafrost at 130 cm.
LOCATION : +/- 20 m. north of the runway, south limit of the 2007 delineation.

SAMPLE NUMBER : **B07-NA-0112/114**
MATRIX : Soil
DESCRIPTION : Silty clay, light to moderate fuel odor, depth 110 cm, permafrost at 130 cm.
LOCATION : Few meters southeast of the shed located east side of the tanks, +/- 20 m. north of the runway.

SAMPLE NUMBER : **B07-NA-0113**
MATRIX : Soil
DESCRIPTION : Silty clay with few sand, no odor, depth 90 cm, permafrost at 130 cm.
LOCATION : Few meters southeast of the shed located east side of the tanks, few meters north of the runway, southeast limit of the 2007 delineation.

SAMPLE NUMBER : **B07-NA-0115**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 90 cm, permafrost at 130 cm.
LOCATION : Few meters southeast of the shed located east side of the tanks, few meters north of the runway.

SAMPLE NUMBER : **B07-NA-0116**
MATRIX : Soil
DESCRIPTION : Silty clay with few sand, moderate odor, depth 90 cm, permafrost at 100 cm.
LOCATION : Few meters southeast of the shed located east side of the tanks, few meters north of the runway.

SAMPLE NUMBER : **B07-NA-0117**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 90 cm, permafrost at 100 cm.
LOCATION : +/- 30 m. southeast of the shed located east side of the tanks, few meters north of the runway, east limit of the 2007 delineation.

SAMPLE NUMBER : **B07-NA-0118**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 65 cm, permafrost at 85 cm.
LOCATION : Few meters east of the shed located east of the tanks.

SAMPLE NUMBER : **B07-NA-0119 BG**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 80 cm, permafrost at 90 cm.
LOCATION : +/- 20 m. east of the shed located east of the tanks.

SAMPLE NUMBER : **B07-NA-0120**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 80 cm, permafrost at 100 cm.
LOCATION : Few meters northeast of the shed located east of the tanks.

SAMPLE NUMBER : **B07-NA-0121**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 80 cm, permafrost at 90 cm.
LOCATION : Few meters northeast of the bladders located north of the tanks.

SAMPLE NUMBER : **B07-NA-0122**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 80 cm, permafrost at 90 cm.
LOCATION : +/-10 m. north of the bladders located north of the tanks, +/- 90 m. north of the runway.

SAMPLE NUMBER : **B07-NA-0123**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 90 cm, permafrost at 110 cm.
LOCATION : Few meters west of the bladders located north of the tanks.

SAMPLE NUMBER : **B07-NA-0124**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 90 cm, permafrost at 110 cm.
LOCATION : +/- 15 m. west of the tanks, west limit of the 2007 delineation.

SAMPLE NUMBER : **B07-NA-0125**
MATRIX : Soil
DESCRIPTION : Silty clay, no odor, depth 90 cm, permafrost at 110 cm.
LOCATION : +/- 10 m. northwest of the bladders located north of the tanks, north limit of the 2007 delineation.

Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337401**	**1337402**	**1337403**	**1337404**
Your Reference	07NA0100	07NA0101	07NA0102	07NA0103
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06

Parameter(s) Method Reference					
BTEX	Preparation	2007-08-08	2007-08-08	2007-08-08	2007-08-08
Volatile Organic Compounds (GC-MS) Result on dry weight PON-13-12-97 (REF MA 400 - COV 1 1, CEAEQ)	Analysis	2007-08-08	2007-08-08	2007-08-08	2007-08-08
	Sequential No	132032	132032	132032	132032
Benzene	mg/kg	6.4 (>D)	4.0 (B-C)	2.5 (B-C)	< 0.1 (<A)
Toluene	mg/kg	48.8 (>D)	12.6 (B-C)	13.3 (B-C)	< 0.1 (<A)
Ethylbenzene	mg/kg	17.1 (B-C)	4.8 (A-B)	7.7 (B-C)	< 0.1 (<A)
Xylenes	mg/kg	85.6 (>D)	31.2 (B-C)	44.6 (B-C)	0.4 (A-B)
Recuperation %					
Dibromofluoromethane	%	91%	100%	101%	96%
D8-Toluene	%	126%	124%	121%	118%
1-Bromo-4-fluorobenzene	%	114%	112%	109%	105%
Polycyclic aromatic hydrocarbons	Preparation	2007-08-09	2007-08-09	2007-08-09	2007-08-09
PAH & phenols by GC-MS Result on dry weight PON-13-11-96 (REF. MA 40 -HAP 1 1, MA 408-PHE 1.0)	Analysis	2007-08-09	2007-08-09	2007-08-09	2007-08-09
	Sequential No	132092	132092	132092	132092
Naphthalene	mg/kg	1.3 (A-B)	< 0.1 (<A)	0.2 (A-B)	< 0.1 (<A)
2-Methylnaphthalene	mg/kg	2.4 (B-C)	< 0.1 (<A)	0.2 (A-B)	< 0.1 (<A)
1-Methylnaphthalene	mg/kg	1.4 (B-C)	< 0.1 (<A)	0.1 (A)	< 0.1 (<A)
1,3-Dimethylnaphthalene	mg/kg	4.9 (B-C)	< 0.1 (<A)	0.6 (A-B)	< 0.1 (<A)
Acenaphthylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Acenaphthene	mg/kg	0.2 (A-B)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
2,3,5-Trimethylnaphthalene	mg/kg	1.1 (B-C)	< 0.1 (<A)	0.1 (A)	< 0.1 (<A)
Fluorene	mg/kg	0.2 (A-B)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Phenanthrene	mg/kg	0.1 (A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(c) Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Chrysene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
7,12-Dimethylbenzo(a)anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)

Bodycote Groupe d'Essais
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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337401**	**1337402**	**1337403**	**1337404**
Your Reference	07NA0100	07NA0101	07NA0102	07NA0103
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06

Parameter(s) Method Reference					
Benzo(b,j,k)Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
3-Methylcholanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Indeno(1,2,3-cd)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo(a,h)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(g,h,i)Perylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,l) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a, i)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,h) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
PAH Total	mg/kg	11.7	ND	1.2	ND
Recuperation %					
D10-Fluorene	%	93 %	105 %	85 %	100 %
D10-Pyrene	%	90 %	94 %	80 %	96 %
D12-Benzo[a]pyrene	%	95 %	97 %	78 %	94 %

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Request Number: 07-280431

Client: CONSEIL NATIONAL DE RECHERCHES Canada, IR

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

		Sample(s)			
	Lab. No.	**1337405**	**1337406**	**1337407**	**1337408**
	Your Reference	07NA0104	07NA0105	07NA0106	07NA0107
	Matrix	Soil	Soil	Soil	Soil
	Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
	Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
	Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
	Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06
Parameter(s) Method Reference					
BTEX	Preparation	2007-08-08	2007-08-08	2007-08-08	2007-08-08
Volatile Organic Compounds (GC-MS) Result on dry weight PON-13-12-97 (REF:MA. 400 - COV 1.1, CEAEQ)	Analysis	2007-08-08	2007-08-08	2007-08-08	2007-08-08
	Sequential No.	132032	132032	132032	132032
Benzene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	2.5 (B-C)	0.5 (B)
Toluene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Ethylbenzene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	3.7 (A-B)	2.2 (A-B)
Xylenes	mg/kg	< 0.1 (<A)	< 0.1 (<A)	6.4 (B-C)	4.8 (A-B)
Recuperation %					
Dibromofluoromethane	%	94%	97%	97%	99%
D8-Toluene	%	115%	121%	123%	123%
1-Bromo-4-fluorobenzene	%	103%	108%	109%	111%
Polycyclic aromatic hydrocarbons	Preparation	2007-08-09	2007-08-09	2007-08-09	2007-08-09
PAH & phenols by GC-MS Result on dry weight PON-13-11-96 (REF: MA 40 -HAP 1.1, MA 408-PHE 1.0)	Analysis	2007-08-09	2007-08-09	2007-08-09	2007-08-09
	Sequential No.	132092	132092	132092	132092
Naphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	7.4 (B-C)	12.4 (B-C)
2-Methylnaphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	30.3 (C-D)	49.2 (C-D)
1-Methylnaphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	23.9 (C-D)	33.5 (C-D)
1,3-Dimethylnaphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	32.4 (C-D)	37.8 (C-D)
Acenaphthylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	0.3 (A-B)	0.4 (A-B)
Acenaphthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	1.1 (A-B)	1.5 (A-B)
2,3,5-Trimethylnaphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	5.0 (B-C)	6.8 (B-C)
Fluorene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	2.0 (A-B)	2.7 (A-B)
Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	0.7 (A-B)	1.0 (A-B)
Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(c) Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Chrysene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
7,12-Dimethylbenzo(a)anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)

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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337405**	**1337406**	**1337407**	**1337408**
Your Reference	07NA0104	07NA0105	07NA0106	07NA0107
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06

Parameter(s) Method Reference					
Benzo(b,j,k)Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
3-Methylcholanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Indeno(1,2,3-cd)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo(a,h)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(g,h,i)Perylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,l) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a, i)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,h) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
PAH Total	mg/kg	ND	ND	103	145
Recuperation %					
D10-Fluorene	%	101 %	95 %	89 %	80 %
D10-Pyrene	%	96 %	91 %	98 %	90 %
D12-Benzo[a]pyrene	%	99 %	93 %	87 %	72 %

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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337409**	**1337410**	**1337411**	**1337412**
Your Reference	07NA0108	07NA0109	07NA0110	07NA0111-BG
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06
Parameter(s) Method Reference				
BTEX	Preparation	2007-08-08	2007-08-08	2007-08-08	2007-08-08
Volatile Organic Compounds (GC-MS) Result on dry weight PON-13-12-97 (REF MA 400 - COV 1.1, CEAEQ)	Analysis	2007-08-08	2007-08-08	2007-08-08	2007-08-08
	Sequential No.	132032	132032	132032	132032
Benzene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.8 (<C)	< 0.1 (<A)
Toluene	mg/kg	< 0.1 (<A)	0.3 (A-B)	< 0.8 (<B)	< 0.1 (<A)
Ethylbenzene	mg/kg	4.6 (A-B)	1.5 (A-B)	7.0 (B-C)	< 0.1 (<A)
Xylenes	mg/kg	28.9 (B-C)	10.8 (B-C)	72.5 (>D)	< 0.1 (<A)
Recuperation %					
Dibromofluoromethane	%	94%	95%	85%	94%
D8-Toluene	%	122%	127%	122%	123%
1-Bromo-4-fluorobenzene	%	106%	113%	115%	110%
Polycyclic aromatic hydrocarbons	Preparation	2007-08-09	2007-08-09	2007-08-09	2007-08-09
PAH & phenols by GC-MS Result on dry weight PON-13-11-96 (REF MA 40 -HAP 1.1, MA 408-PHE 1.0)	Analysis	2007-08-09	2007-08-09	2007-08-09	2007-08-09
	Sequential No.	132092	132092	132092	132092
Naphthalene	mg/kg	36.5 (B-C)	2.9 (A-B)	17.7 (B-C)	< 0.1 (<A)
2-Methylnaphthalene	mg/kg	77.3 (>D)	4.8 (B-C)	32.9 (C-D)	< 0.1 (<A)
1-Methylnaphthalene	mg/kg	44.4 (C-D)	2.7 (B-C)	19.4 (C-D)	< 0.1 (<A)
1,3-Dimethylnaphthalene	mg/kg	34.7 (C-D)	2.2 (B-C)	16.6 (C-D)	< 0.1 (<A)
Acenaphthylene	mg/kg	0.4 (A-B)	< 0.1 (<A)	0.2 (A-B)	< 0.1 (<A)
Acenaphthene	mg/kg	1.2 (A-B)	< 0.1 (<A)	0.6 (A-B)	< 0.1 (<A)
2,3,5-Trimethylnaphthalene	mg/kg	3.4 (B-C)	0.1 (A)	1.0 (B)	< 0.1 (<A)
Fluorene	mg/kg	0.7 (A-B)	< 0.1 (<A)	0.5 (A-B)	< 0.1 (<A)
Phenanthrene	mg/kg	0.2 (A-B)	< 0.1 (<A)	0.2 (A-B)	< 0.1 (<A)
Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(c) Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Chrysene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
7,12-Dimethylbenzo(a)anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)

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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337409**	**1337410**	**1337411**	**1337412**
Your Reference	07NA0108	07NA0109	07NA0110	07NA0111-BG
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06

Parameter(s) Method Reference					
Benzo(b,j,k)Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
3-Methylcholanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Indeno(1,2,3-cd)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo(a,h)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(g,h,i)Perylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,l) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a, i)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,h) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
PAH Total	mg/kg	199	12.6	88.9	ND
Recuperation %					
D10-Fluorene	%	81 %	100 %	89 %	89 %
D10-Pyrene	%	98 %	95 %	90 %	89 %
D12-Benzo[a]pyrene	%	88 %	95 %	91 %	88 %

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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337413**	**1337414**	**1337415**	**1337416**
Your Reference	07NA0112	07NA0113	07NA0114	07NA0115
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06

Parameter(s) Method Reference					
BTEX	Preparation	2007-08-08	2007-08-08	2007-08-08	2007-08-09
Volatile Organic Compounds (GC-MS) Result on dry weight PON-13-12-97 (REF MA 400 - COV 1.1, CEAEQ)	Analysis	2007-08-08	2007-08-08	2007-08-08	2007-08-09
	Sequential No.	132032	132032	132032	132105
Benzene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Toluene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Ethylbenzene	mg/kg	0.2 (A)	< 0.1 (<A)	0.2 (A)	< 0.1 (<A)
Xylenes	mg/kg	1.5 (A-B)	< 0.1 (<A)	1.6 (A-B)	< 0.1 (<A)
Recuperation %					
Dibromofluoromethane	%	94%	92%	93%	104%
D8-Toluene	%	126%	121%	127%	101%
1-Bromo-4-fluorobenzene	%	113%	106%	114%	94%
Polycyclic aromatic hydrocarbons	Preparation	2007-08-09	2007-08-09	2007-08-09	2007-08-09
PAH & phenols by GC-MS Result on dry weight PON-13-11-96 (REF MA 40 -HAP 1.1, MA 408-PHÉ 1.0)	Analysis	2007-08-09	2007-08-09	2007-08-09	2007-08-09
	Sequential No.	132092	132092	132092	132093
Naphthalene	mg/kg	9.3 (B-C)	< 0.1 (<A)	2.5 (A-B)	< 0.1 (<A)
2-Methylnaphthalene	mg/kg	16.0 (C-D)	< 0.1 (<A)	5.2 (B-C)	< 0.1 (<A)
1-Methylnaphthalene	mg/kg	9.7 (B-C)	< 0.1 (<A)	3.0 (B-C)	< 0.1 (<A)
1,3-Dimethylnaphthalene	mg/kg	8.1 (B-C)	< 0.1 (<A)	2.3 (B-C)	< 0.1 (<A)
Acenaphthylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Acenaphthene	mg/kg	0.3 (A-B)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
2,3,5-Trimethylnaphthalene	mg/kg	0.5 (A-B)	< 0.1 (<A)	0.1 (A)	< 0.1 (<A)
Fluorene	mg/kg	0.2 (A-B)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(c) Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Chrysene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
7,12-Dimethylbenzo(a)anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)

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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337413**	**1337414**	**1337415**	**1337416**
Your Reference	07NA0112	07NA0113	07NA0114	07NA0115
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06

Parameter(s) Method Reference					
Benzo(b,j,k)Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
3-Methylcholanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Indeno(1,2,3-cd)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo(a,h)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(g,h,i)Perylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,l) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a, i)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,h) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
PAH Total	mg/kg	44.0	ND	13.2	ND
Recuperation %					
D10-Fluorene	%	95 %	104 %	99 %	92 %
D10-Pyrene	%	97 %	101 %	98 %	99 %
D12-Benzo[a]pyrene	%	93 %	104 %	96 %	87 %

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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337417**	**1337418**	**1337419**	**1337420**
Your Reference	07NA0116	07NA0117	07NA0118	07NA0119-BG
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06

Parameter(s) Method Reference					
BTEX	Preparation	2007-08-09	2007-08-09	2007-08-09	2007-08-09
Volatile Organic Compounds (GC-MS) Result on dry weight PON-13-12-97 (REF MA 400 - COV 1.1, CEAEQ)	Analysis	2007-08-09	2007-08-09	2007-08-09	2007-08-09
	Sequential No.	132105	132105	132105	132105
Benzene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Toluene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Ethylbenzene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Xylenes	mg/kg	0.2 (A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Recuperation %					
Dibromofluoromethane	%	101%	105%	103%	100%
D8-Toluene	%	110%	109%	108%	104%
1-Bromo-4-fluorobenzene	%	119%	101%	100%	98%
Polycyclic aromatic hydrocarbons	Preparation	2007-08-09	2007-08-09	2007-08-09	2007-08-09
PAH & phenols by GC-MS Result on dry weight PON-13-11-96 (REF. MA 40 -HAP 1.1, MA 408-PHÉ 1.0)	Analysis	2007-08-09	2007-08-09	2007-08-09	2007-08-09
	Sequential No.	132093	132093	132093	132093
Naphthalene	mg/kg	0.4 (A-B)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
2-Methylnaphthalene	mg/kg	1.1 (B-C)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
1-Methylnaphthalene	mg/kg	2.0 (B-C)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
1,3-Dimethylnaphthalene	mg/kg	3.0 (B-C)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Acenaphthylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Acenaphthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
2,3,5-Trimethylnaphthalene	mg/kg	0.3 (A-B)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Fluorene	mg/kg	0.1 (A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(c) Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Chrysene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
7,12-Dimethylbenzo(a)anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)

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Request Number: 07-280431

Client: CONSEIL NATIONAL DE RECHERCHES Canada, IR

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337417**	**1337418**	**1337419**	**1337420**
Your Reference	07NA0116	07NA0117	07NA0118	07NA0119-BG
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06

Parameter(s) Method Reference					
Benzo(b,j,k)Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
3-Methylcholanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Indeno(1,2,3-cd)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo(a,h)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(g,h,i)Perylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,l) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a, i)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,h) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
PAH Total	mg/kg	7.0	ND	ND	ND
Recuperation %					
D10-Fluorene	%	90 %	87 %	92 %	91 %
D10-Pyrene	%	93 %	93 %	98 %	98 %
D12-Benzo[a]pyrene	%	81 %	82 %	87 %	86 %

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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337421**	**1337422**	**1337423**	**1337424**
Your Reference	07NA0120	07NA0121	07NA0122	07NA0123
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06

Parameter(s) Method Reference					
BTEX	Preparation	2007-08-09	2007-08-09	2007-08-09	2007-08-09
Volatile Organic Compounds (GC-MS). Result on dry weight. PON-13-12-97 (REF MA 400 - COV 1.1, CEAEQ)	Analysis	2007-08-09	2007-08-09	2007-08-09	2007-08-09
	Sequential No.	132105	132105	132105	132105
Benzene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Toluene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Ethylbenzene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Xylenes	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Recuperation %					
Dibromofluoromethane	%	98%	103%	106%	104%
D8-Toluene	%	102%	115%	118%	110%
1-Bromo-4-fluorobenzene	%	99%	109%	106%	106%
Polycyclic aromatic hydrocarbons	Preparation	2007-08-09	2007-08-09	2007-08-09	2007-08-09
PAH & phenols by GC-MS. Result on dry weight. PON-13-11-96 (REF MA 40 -HAP 1.1, MA 408-PHE 1.0)	Analysis	2007-08-09	2007-08-09	2007-08-09	2007-08-09
	Sequential No.	132093	132093	132093	132093
Naphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
2-Methylnaphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
1-Methylnaphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
1,3-Dimethylnaphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Acenaphthylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Acenaphthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
2,3,5-Trimethylnaphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Fluorene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(c) Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Chrysene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
7,12-Dimethylbenzo(a)anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)

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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337421**	**1337422**	**1337423**	**1337424**
Your Reference	07NA0120	07NA0121	07NA0122	07NA0123
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-27
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06

Parameter(s) Method Reference					
Benzo(b,j,k)Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(a)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
3-Methylcholanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Indeno(1,2,3-cd)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo(a,h)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Benzo(g,h,i)Perylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,l) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a, i)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
Dibenzo (a,h) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)
PAH Total	mg/kg	ND	ND	ND	ND
Recuperation %					
D10-Fluorene	%	96 %	99 %	90 %	87 %
D10-Pyrene	%	103 %	108 %	101 %	97 %
D12-Benzo[a]pyrene	%	90 %	92 %	89 %	87 %

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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

		Sample(s)			
	Lab. No.	**1337425**	**1337426**	**1337427**	**1337428**
	Your Reference	07NA0124	07NA0125	FB07-S10527	07MC0126-BG
	Matrix	Soil	Soil	Soil	Soil
	Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
	Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
	Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-28
	Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06
Parameter(s) Method Ref. Reference					
BTEX	Preparation	2007-08-09	2007-08-09	-	2007-08-08
Volatile Organic Compounds (GC-MS) Result on dry weight PON-13-12-97 (REF:MA 400 - COV 1 1, CEAEQ)	Analysis	2007-08-09	2007-08-09	-	2007-08-08
	Sequential No.	132105	132105	-	132024
Benzene	mg/kg	0.1 (A)	< 0.1 (<A)	-	< 0.1 (<A)
Toluene	mg/kg	0.3 (A-B)	< 0.1 (<A)	-	< 0.1 (<A)
Ethylbenzene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	-	< 0.1 (<A)
Xylenes	mg/kg	1.0 (A-B)	< 0.1 (<A)	-	< 0.1 (<A)
Recuperation %					
Dibromofluoromethane	%	98%	118%	-	110%
D8-Toluene	%	100%	116%	-	103%
1-Bromo-4-fluorobenzene	%	92%	114%	-	96%
Monocyclic aromatic hydrocarbons (MAH)	Preparation	-	-	2007-08-08	-
Volatile Organic Compounds (GC-MS) Result on dry weight. PON-13-12-97 (REF:MA 400 - COV 1 1, CEAEQ)	Analysis	-	-	2007-08-08	-
	Sequential No.	-	-	132030	-
Benzene	mg/kg	-	-	< 0.1 (<A)	-
Ethylbenzene	mg/kg	-	-	< 0.1 (<A)	-
Chlorobenzene	mg/kg	-	-	< 0.1 (<A)	-
Toluene	mg/kg	-	-	< 0.1 (<A)	-
Xylenes	mg/kg	-	-	< 0.1 (<A)	-
Styrene	mg/kg	-	-	< 0.1 (<A)	-
1,2-Dichlorobenzene	mg/kg	-	-	< 0.1 (<A)	-
1,3-Dichlorobenzene	mg/kg	-	-	< 0.1 (<A)	-
1,4-Dichlorobenzene	mg/kg	-	-	< 0.1 (<A)	-
Recuperation %					
Dibromofluoromethane	%	-	-	112%	-
D8-Toluene	%	-	-	102%	-
1-Bromo-4-fluorobenzene	%	-	-	116%	-

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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

	Sample(s)			
Lab. No.	**1337425**	**1337426**	**1337427**	**1337428**
Your Reference	07NA0124	07NA0125	FB07-S10527	07MC0126-BG
Matrix	Soil	Soil	Soil	Soil
Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-28
Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06

Parameter(s) Method Reference					
Polycyclic aromatic hydrocarbons	Preparation	2007-08-09	2007-08-09	2007-08-09	-
PAH & phenols by GC-MS Result on dry weight PON-13-11-96 (REF MA 40 -HAP 1.1, MA 408-PHÉ 1.0)	Analysis	2007-08-09	2007-08-09	2007-08-09	-
	Sequential No	132093	132093	132093	-
Naphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
2-Methylnaphthalene	mg/kg	0.1 (A)	< 0.1 (<A)	< 0.1 (<A)	-
1-Methylnaphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
1,3-Dimethylnaphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Acenaphthylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Acenaphthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
2,3,5-Trimethylnaphthalene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Fluorene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Benzo(c) Phenanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Benzo(a)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Chrysene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
7,12-Dimethylbenzo(a)anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Benzo(b,j,k)Fluoranthene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Benzo(a)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
3-Methylcholanthrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Indeno(1,2,3-cd)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Dibenzo(a,h)Anthracene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Benzo(g,h,i)Perylene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Dibenzo (a,l) Pyrene	mg/kg	< 0.1 (<A)	0.1 (A)	< 0.1 (<A)	-
Dibenzo (a, i)Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
Dibenzo (a,h) Pyrene	mg/kg	< 0.1 (<A)	< 0.1 (<A)	< 0.1 (<A)	-
PAH Total	mg/kg	0.1	0.1	ND	-

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Request Number: 07-280431

Client: **CONSEIL NATIONAL DE RECHERCHES Canada, IR**

P.O. Number	Your Project ID.	Project Manager
641 538	Eureka 07 (38794à99,38083,800)	J. Sirois / M. Désilets

		Sample(s)			
	Lab. No.	**1337425**	**1337426**	**1337427**	**1337428**
	Your Reference	07NA0124	07NA0125	FB07-S10527	07MC0126-BG
	Matrix	Soil	Soil	Soil	Soil
	Sampled by	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.	J.S. / D.J.
	Site sampled	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island	Eureka, Ellesmere Island
	Date sampled	2007-07-27	2007-07-27	2007-07-27	2007-07-28
	Date received	2007-08-06	2007-08-06	2007-08-06	2007-08-06
Parameter(s) Method / Ref. Reference					
Recuperation %					
D10-Fluorene	%	94 %	96 %	93 %	-
D10-Pyrene	%	102 %	105 %	98 %	-
D12-Benzo[a]pyrene	%	89 %	94 %	92 %	-
THH	Preparation	-	-	2007-08-08	-
Volatile Organic Compounds (GC-MS) Result on dry weight PON-13-12-97 (REF MA 400 - COV 1 1, CEAEQ)	Analysis	-	-	2007-08-08	-
	Sequential No.	-	-	132030	-
Vinyl Chloride	mg/kg	-	-	< 0.4 (<A)	-
1,1-Dichloroethene	mg/kg	-	-	< 0.1 (<A)	-
Dichloromethane	mg/kg	-	-	< 0.1 (<B)	-
trans-1,2-Dichloroethene	mg/kg	-	-	< 0.1 (<A)	-
1,1-Dichloroethane	mg/kg	-	-	< 0.1 (<A)	-
cis-1,2-dichloroethene	mg/kg	-	-	< 0.1 (<A)	-
Chloroform	mg/kg	-	-	< 0.1 (<A)	-
1,1,1-Trichloroethane	mg/kg	-	-	< 0.1 (<A)	-
Carbon Tetrachloride	mg/kg	-	-	< 0.1 (<A)	-
1,2-Dichloroethane	mg/kg	-	-	< 0.1 (<A)	-
Trichloroethene	mg/kg	-	-	< 0.1 (<A)	-
1,2-Dichloropropane	mg/kg	-	-	< 0.1 (<A)	-
cis-1,3-Dichloropropene	mg/kg	-	-	< 0.1 (<A)	-
trans-1,3-Dichloropropene	mg/kg	-	-	< 0.1 (<A)	-
1,1,2-Trichloroethane	mg/kg	-	-	< 0.1 (<A)	-
Tetrachloroethene	mg/kg	-	-	< 0.1 (<A)	-
1,1,2,2-Tetrachloroethane	mg/kg	-	-	< 0.1 (<A)	-
Recuperation %					
Dibromofluoromethane	%	-	-	112%	-
D8-Toluene	%	-	-	102%	-
1-Bromo-4-fluorobenzene	%	-	-	116%	-

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ARCTIC *IN SITU* BIOREMEDIATION AND SITE CHARACTERIZATION: SITE WORK SUMMARIES FOR CFS-ALERT AND CFS-EUREKA, NUNAVUT

Final Report

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Canada

3.9. S-10257 North Airstrip Apron

History and Location

The North Airstrip Apron is located on the northwest side of the airstrip runway. This area contains 4 aboveground diesel fuel storage tanks installed in 1999 to replace 2 diesel fuel bladders of 90,000 L capacity. The diesel tanks are currently not surrounded by berms. During the 2006 and 2007 sampling campaigns, 2 fuel bladders were still on-site located adjacent to, and north of the new fuel tanks. A fuel pump and hoses were also present on this site, and several barrels were temporarily stored on the site.

During the 2006 sampling campaign, several trenches were noted on site, suggesting that soil samples were recently collected. Also, during this campaign, the bladders appeared to be in active use as transfer hoses were seen to be attached. DND has indicated that the location of the 4 diesel fuel storage tanks is likely to change in the near future.

The topography of the site is mainly level and the soil is composed of clay and silt. A pool of standing water was noted in 2006 and 2007, but no drainage pathway was recorded on site. The North Airstrip Apron site is located approximately 1,100 m from Slidre Fiord.

Latitude and Longitude

79.9966N -85.8410W

BRI Field Work Summary

In 2006, 10 soil samples, including 1 duplicate pair, were collected at various depths and were analyzed for F1-F4 and BTEX. The samples were collected on the south edge of the site, downgradient from the diesel fuel tanks.

In 2007 a detailed site characterization was performed. A total of 25 subsurface soil samples, including 1 duplicate pair, were collected and analyzed for F1-F4, BTEX and PAHs.

Summary of Site Characterization

Each soil sample collected in 2006 contained a variety of petroleum hydrocarbons at concentrations exceeding the applicable CCME guidelines. Concentrations of F1 and F2 above CCME guidelines were detected in 9 and 10 samples, respectively. Significant benzene concentrations, 1,900 times above CCME guidelines, were measured in 1 soil sample. Toluene, ethylbenzene and total xylene concentrations above the CCME guidelines were found in 4, 6, and 6 soil samples, respectively.

Of the samples collected in 2007, F1, F2 and F3 at concentrations above the CCME guidelines were measured in 12, 11 and 1 soil samples, respectively. Benzene, toluene, ethylbenzene and total xylene concentrations exceeding the CCME guidelines were detected in 5, 3, 10 and 5 soil samples, respectively. PAHs were detected in 10 soil samples, but only naphthalene in one sample was above the CCME guidelines. The results indicated the presence of 2 to 3 hydrocarbon contaminated areas. These areas were located between the 4 diesel fuel storage tanks and the airstrip.

Quantity of Contaminated Soil

1,755 m^3

Recommendations

The area surrounding the existing fuel storage tanks and bladders was sampled and PHC contamination was detected in the area between the fuel tanks and the airstrip. The contamination appears to be divided into 2 to 3 areas. The majority of the contamination was F1 and F2, with several sites having some or all components of BTEX above the CCME guidelines. F3 and PAH (naphthalene) contamination was detected in 1 sample for each contaminant (2 samples total).

The current location of the fuel storage tanks may change, in which case treatment should be delayed until all modifications at the site are completed. This would enable a single treatment program vs. multiple smaller programs.

Addressing the contamination at this site will require careful coordination as this area is in frequent use by both light (eg. Twin Otter) and heavy (e.g. C-130 Hercules) aircraft for refueling. The most appropriate approach is the excavation of the contaminated soil followed by immediate back-filling

to minimize thawing of the permafrost. The excavated soil would then be treated in an *ex situ* biopile with nutrient amendments.

NCS Score

60.0, Class 2

FCSAP Step

Step 8

3.10. S-10528 South Airstrip Dump

History and Location

The South Airstrip Dump is located on the south side of the airstrip, just west of the East Airstrip Landfill and part of the area that has been proposed for a new series of landfill cells that would receive the barrels of ash that are produced by the AES incinerator. This dump contains mostly demolition debris along with domestic garbage and ash from burning garbage and is currently inactive. The land in this area slopes to the south toward Slidre Fiord.

Previous investigations in 1998 (ESG) detected copper, lead and zinc at or above guidelines in one sample (out of 7) collected from a pile of ash where garbage was burnt.

Latitude and Longitude

79.9921N -85.7814W

BRI Field Work Summary

Three surface soil samples were collected in the summer of 2006 and analyzed for metals.

Summary of Site Characterization

None of the samples contained metals above CCME guidelines.

Quantity of Contaminated Soil

$1\ m^3$

Recommendations

Only one contaminated sample was detected during the previous sampling campaign (ESG) and no migration of contaminants was been detected. Due to these results, no further characterization work is required for this site. Excavation of the metals contaminated hotspot and interment into a secure landfill would permit closure of this site.

NCS Score

34.6, Class N

FCSAP Step

Step 8

ARCTIC *IN SITU* AND *EX SITU* SITE REMEDIATION AT CFS-ALERT AND SITE CHARACTERIZATION AT CFS-EUREKA

Final Report FY12-13

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March 5, 2013

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significantly above the background nickel concentrations and will significantly reduce the number of sites considered contaminated.

4) *In situ* bioremediation. Field work at the Oxidator Building (S-349) and Baker's Dozen (S-10216) sites including sample collection and nutrient amendment was successfully completed. Laboratory analyses of these T=0 samples revealed important concentrations of F2 remain on site. Continuation of the annual treatment regime with aggressive turning of the soil is fully recommended.

5) Glycol monitoring of Runway De-Icing Area. Sampling of the drainage channels leading away from the Runway De-Icing area towards Dumbell Bay was completed and no glycols were detected in any of the samples. It is recommended that glycol sampling be performed on an annual basis during the spring freshet to ensure glycol migration towards Dumbell Bay is not occurring.

6) CFS-Eureka North Airstrip Apron (S-10527) delineation. Sample collection in and around the bermed area for the previously installed fuel bladders was successfully completed. Laboratory analyses revealed that two samples collected adjacent to the berm site were impacted by F2 and one of these samples also possessed benzene and ethylbenzene above CCME guidelines. One localized area within the berm was also contaminated with F2. Due to permafrost and soil stability issues in the area, the most promising treatment approach would be *ex situ* bioremediation of the soils once an engineered biopile system can be created in the CFS-Eureka area.

9 CFS-Eureka North Airstrip Apron (S-10527) Delineation

9.1 History

The North Airstrip Apron (S-10527) at CFS-Eureka is located on the northwest side of the airstrip runway. This area contains 4 aboveground diesel fuel storage tanks installed in 1999 to replace 2 diesel fuel bladders of 90,000 L capacity. The diesel tanks are currently not surrounded by berms. During the 2006 and 2007 sampling campaigns, 2 fuel bladders were still on-site located adjacent to, and north of the new fuel tanks. These fuel bladders were surrounded by an elevated berm, the base of which was approximately 1 m above ground and the berm sides extended approximately 50 cm above the base

The two fuel bladders were removed (in ca. 2010) and the area immediately surrounding the bermed area was targeted for sampling during the 2012 field campaign.

9.2 Field Work and Results

Sampling of the area immediately surrounding and within the bermed area was performed on July 9, 2012. A total of ten test pits were dug using a backhoe and 11 samples (including one field duplicate) were collected along the side walls manually. Samples were collected and analyzed for the following parameters: BTEX and F1-F4. The depth to permafrost in the area surrounding the berm was approximately 80-100 cm. The locations of the collected samples are shown in Figure 15, and the results of chemical analyses are presented in Table 19.

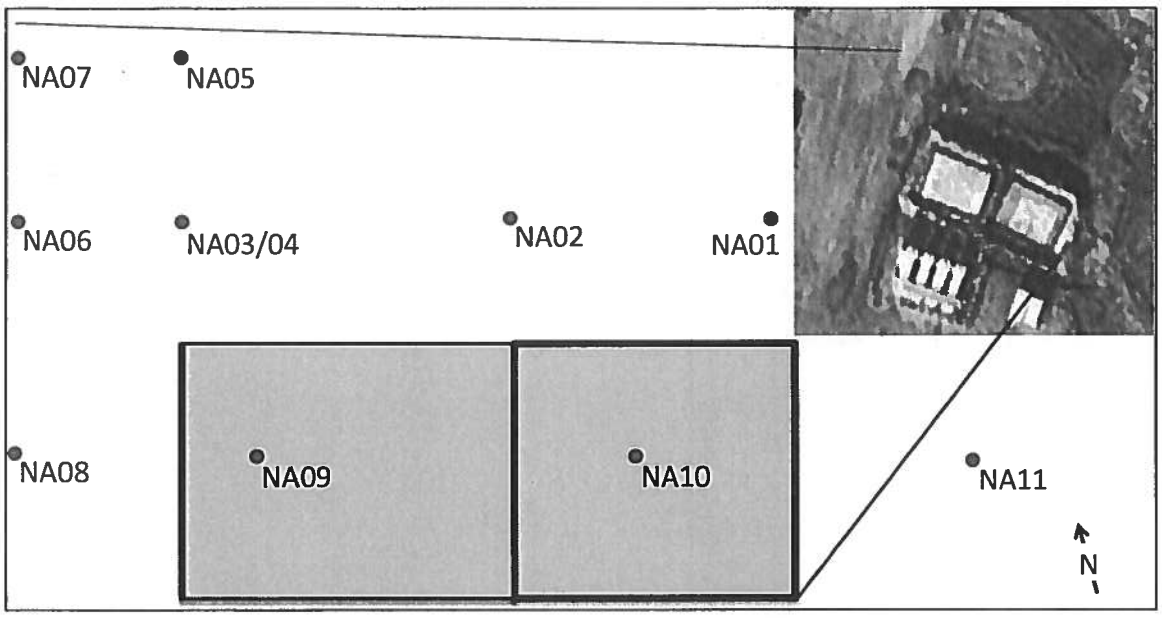

Figure 15. North Airstrip Apron (S-10527) sample locations.

The analytical chemistry results indicate that of the 11 samples collected, one exceeded CCME guidelines for F1 (B12-NA03), three exceeded CCME guidelines for F2 (B12-NA06, B12-NA08 and B12-NA10), and one sample exceeded CCME guidelines for both benzene and ethylbenzene (B12-NA06).

It is suspected that PHC contamination may be present in the area immediately to the west of B12-NA06, but due to the presence of an active roadway, excavation in this area was not possible. The contamination observed in B12-NA10 was not present in the upper sand layer composing the berm base, but rather in the layer immediately under the sand base which also contained buried barrels. The depth of the sample in this area was limited to 15 cm due to the presence of the buried barrels.

Table 19. North Airstrip Apron (S-10527) analytical chemistry results.

Contaminant	Guidelin (mg/kg)	Sample name/Sampling date (mg/kg)											
	CCME [1]	B12-NA01	B12-NA02	B12-NA03	B12-NA04	B12-NA05	B12-NA06	B12-NA07	B12-NA08	B12-NA09	B12-NA10	B12-NA11	RDL
		10/07/2012	10/07/2012	10/07/2012	dup. B12-NA03	10/07/2012	10/07/2012	10/07/2012	10/07/2012	10/07/2012	10/07/2012	10/07/2012	
F1 Petroleum Hydrocarbons (C6 - C10) [a]	320	<10	<10	480	48	<10	110	<10	<10	<10	39	39	10
F2 Petroleum Hydrocarbons (C10 - C16) [a]	260	<10	<10	14	11	<10	470	<10	330	<10	910	<10	10
F3 Petroleum Hydrocarbons (C16 - C34) [a]	1,700	26	48	60	50	89	140	37	320	44	48	41	10
F4 Petroleum Hydrocarbons (C34 - C50) [a]	3,300	<10	<10	12	16	13	110	22	560	25	<10	21	10

1) CCME Petroleum Hydrocarbons in Soil - Technical Supplement, Table 3. Tier 1 PHCs (mg/kg soil) for Industrial, coarse-grained surface soils (January 2008).

<## Less than the method detection limit

Concentration is over the CCME guideline (2008)

Contaminant	Guidelin (mg/kg)	Sample name/Sampling date (mg/kg)											
	CCME [1]	B12-NA01	B12-NA02	B12-NA03	B12-NA04	B12-NA05	B12-NA06	B12-NA07	B12-NA08	B12-NA09	B12-NA10	B12-NA11	RDL
		10/07/2012	10/07/2012	10/07/2012	dup. B12-NA03	10/07/2012	10/07/2012	10/07/2012	10/07/2012	10/07/2012	10/07/2012	10/07/2012	
Benzene	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	0.02
Toluene	0.37	<0.02	<0.02	0.09	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02
Ethylbenzene	0.082	<0.02	<0.02	0.07	<0.02	<0.02	0.43	<0.02	<0.02	<0.02	<0.02	<0.02	0.02
Total Xylenes	11	<0.04	<0.04	3.9	1.1	<0.04	0.81	<0.04	<0.04	<0.04	<0.04	<0.04	0.04

1) CCME Canadian Soils Quality Guidelines (industrial, coarse texture) for the Environment and Human Health (1999, rev. 2007).

<## Less than the method detection limit

Concentration is over the CCME guideline (2007)

9.3 Recommendations

Due to the active nature of this area for plane refueling and equipment storage, there exist two remediation options. The first is to employ an *in situ* bioremediation approach to address the contamination in the bermed area and possibly the apron area immediately to the south of the aboveground diesel fuel tanks. The use of this approach is complicated by the fact that effective delivery of treatment amendments would require disturbance of the soil on one or both sides of the aboveground diesel fuel tanks, including the runway apron. The size of the tanks and the issues associated with disturbing the runway area which has already been identified as prone to durability issues, does not currently make this an attractive approach. On the other hand, relocation of the refueling and apron areas for excavation and treatment of the identified contamination would involve a significant investment, not only in relocation but the construction of an engineered biopile, but may be more the more effective solution in the medium to long term.

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Le succès par la science

Maxxam Job #: B237778
Report Date: 2012/07/25

CONSEIL NATIONAL DE RECHERCHE (CNRC-NRC)
Client Project #: ALERT

Your P.O. #: 760322
Sampler Initials: DJ

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID					R62369		R62370		R62370		R62372			
Sampling Date					2012/07/07		2012/07/07		2012/07/07		2012/07/10			
COC Number					7866304		7866304		7866304		7866304			
	Units	**A**	**B**	**C**	**B12-S1**	**CR**	**B12-S2**	**CR**	**B12-S2 Lab-Dup**	**CR**	**B12-NA 01**	**CR**	**RDL**	**QC Batch**
% Moisture	%	-	-	-	10		9.7		9.7		16			
VOLATILES														
Benzene	mg/kg	0.1	0.5	5	<0.02		<0.02		<0.02		<0.02		0.02	1031046
Toluene	mg/kg	0.2	3	30	<0.02		<0.02		<0.02		<0.02		0.02	1031046
Ethylbenzene	mg/kg	0.2	5	50	<0.02		<0.02		<0.02		<0.02		0.02	1031046
p+m-Xylene	mg/kg	-	-	-	<0.04		<0.04		<0.04		<0.04		0.04	1031046
o-Xylene	mg/kg	-	-	-	0.15		<0.02		<0.02		<0.02		0.02	1031046
Total_Xylenes	mg/kg	0.2	5	50	0.15	<A	<0.04		<0.04		<0.04		0.04	1031046
F1 (C6-C10)	mg/kg	-	-	-	48		11		<10		<10		10	1031046
F1 (C6-C10) - BTEX	mg/kg	-	-	-	48		11		<10		<10		10	1031046
Surrogate Recovery (%)														
1,4-Difluorobenzene	%	-	-	-	99		100		99		100			1031046
4-Bromofluorobenzene	%	-	-	-	96		95		95		96			1031046
D10-Ethylbenzene	%	-	-	-	111		115		114		115			1031046
D4-1,2-Dichloroethane	%	-	-	-	95		95		96		95			1031046

RDL = Reportable Detection Limit

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Le succès par la science

Maxxam Job #: B237778
Report Date: 2012/07/25

CONSEIL NATIONAL DE RECHERCHE (CNRC-NRC)
Client Project #: ALERT

Your P.O. #: 760322
Sampler Initials: DJ

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID					R62373		R62374		R62375		R62376			
Sampling Date					2012/07/10		2012/07/10		2012/07/10		2012/07/10			
COC Number					7866304		7866304		7866304		7866304			
	Units	A	B	C	B12-NA 02	CR	B12-NA 03	CR	B12-NA 04	CR	B12-NA 05	CR	RDL	QC Batch
% Moisture	%	-	-	-	18		19		19		25			
VOLATILES														
Benzene	mg/kg	0.1	0.5	5	<0.02		<0.02		<0.02		<0.02		0.02	1031046
Toluene	mg/kg	0.2	3	30	<0.02		0.09	<A	0.04	<A	<0.02		0.02	1031046
Ethylbenzene	mg/kg	0.2	5	50	<0.02		0.07	<A	<0.02		<0.02		0.02	1031046
p+m-Xylene	mg/kg	-	-	-	<0.04		1.0		0.26		<0.04		0.04	1031046
o-Xylene	mg/kg	-	-	-	<0.02		2.9		0.86		<0.02		0.02	1031046
Total_Xylenes	mg/kg	0.2	5	50	<0.04		3.9	A-B	1.1	A-B	<0.04		0.04	1031046
F1 (C6-C10)	mg/kg	-	-	-	<10		480		48		<10		10	1031046
F1 (C6-C10) - BTEX	mg/kg	-	-	-	<10		480		47		<10		10	1031046
Surrogate Recovery (%)														
1,4-Difluorobenzene	%	-	-	-	99		99		99		99			1031046
4-Bromofluorobenzene	%	-	-	-	96		97		97		98			1031046
D10-Ethylbenzene	%	-	-	-	118		115		117		121			1031046
D4-1,2-Dichloroethane	%	-	-	-	96		96		95		98			1031046

RDL = Reportable Detection Limit

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Report Date: 2012/07/25

CONSEIL NATIONAL DE RECHERCHE (CNRC-NRC)
Client Project #: ALERT

Your P.O. #: 760322
Sampler Initials: DJ

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID					R62377		R62378		R62379		R62380			
Sampling Date					2012/07/10		2012/07/10		2012/07/10		2012/07/10			
COC Number					7866304		7866304		7866304		7866304			
	Units	A	B	C	B12-NA 06	CR	B12-NA 07	CR	B12-NA 08	CR	B12-NA 09	CR	RDL	QC Batch
% Moisture	%	-	-	-	17		18		16		21			
VOLATILES														
Benzene	mg/kg	0.1	0.5	5	0.12	A-B	<0.02		<0.02		<0.02		0.02	1031046
Toluene	mg/kg	0.2	3	30	<0.02		<0.02		<0.02		<0.02		0.02	1031046
Ethylbenzene	mg/kg	0.2	5	50	0.43	A-B	<0.02		<0.02		<0.02		0.02	1031046
p+m-Xylene	mg/kg	-	-	-	0.78		<0.04		<0.04		<0.04		0.04	1031046
o-Xylene	mg/kg	-	-	-	0.03		<0.02		<0.02		<0.02		0.02	1031046
Total_Xylenes	mg/kg	0.2	5	50	0.81	A-B	<0.04		<0.04		<0.04		0.04	1031046
F1 (C6-C10)	mg/kg	-	-	-	110		<10		<10		<10		10	1031046
F1 (C6-C10) - BTEX	mg/kg	-	-	-	110		<10		<10		<10		10	1031046
Surrogate Recovery (%)														
1,4-Difluorobenzene	%	-	-	-	99		99		100		100			1031046
4-Bromofluorobenzene	%	-	-	-	98		97		97		97			1031046
D10-Ethylbenzene	%	-	-	-	114		114		119		125			1031046
D4-1,2-Dichloroethane	%	-	-	-	96		97		97		95			1031046

RDL = Reportable Detection Limit

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Sampler Initials: DJ

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID					R62381		R62389		R62391			
Sampling Date					2012/07/10		2012/07/07		2012/07/07			
COC Number					7866304		7866304		7866304			
	Units	A	B	C	B12-NA 10	CR	B12-CTRL	CR	B12-FB02-12JN07-231	CR	RDL	QC Batch
% Moisture	%	-	-	-	9.0		12		0			
VOLATILES												
Benzene	mg/kg	0.1	0.5	5	<0.02		<0.02		<0.02		0.02	1031046
Toluene	mg/kg	0.2	3	30	<0.02		<0.02		<0.02		0.02	1031046
Ethylbenzene	mg/kg	0.2	5	50	<0.02		<0.02		<0.02		0.02	1031046
p+m-Xylene	mg/kg	-	-	-	<0.04		<0.04		<0.04		0.04	1031046
o-Xylene	mg/kg	-	-	-	0.02		<0.02		<0.02		0.02	1031046
Total_Xylenes	mg/kg	0.2	5	50	<0.04		<0.04		<0.04		0.04	1031046
F1 (C8-C10)	mg/kg	-	-	-	39		20		<10		10	1031046
F1 (C6-C10) - BTEX	mg/kg	-	-	-	39		20		<10		10	1031046
Surrogate Recovery (%)												
1,4-Difluorobenzene	%	-	-	-	100		99		100			1031046
4-Bromofluorobenzene	%	-	-	-	98		97		96			1031046
D10-Ethylbenzene	%	-	-	-	116		116		114			1031046
D4-1,2-Dichloroethane	%	-	-	-	97		97		95			1031046

RDL = Reportable Detection Limit

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BORDEREAU DE TRANSMISSION D'ÉCHANTILLONS

INFORMATION FACTURATION:
Compagnie: #535 CONSEIL NATIONAL DE RECHERCHE CN
Attention de: David Juck
Adresse: 6100, Royal Mount
Montreal PQ H4P 2R2
Téléphone: (514)496-6100 Téléc: (514)496-6265
Courriel: david.juck@cnrc-nrc.gc.ca

INFORMATION PROJET:
N° de citation: A83022
Nom du projet: Eureka & Alert
Échantillonné par: DJ & AM

À l'usage du laboratoire seulement:
CHARGÉ(E) DE PROJETS: LORENA DI BENEDETTO

ANALYSES REQUISES: Eau potable réglementée ? (O/N); Métaux à filtrer au labo ? (O/N); Hydrocarb. pétro. CCME F1 & BTEX; Hydrocarbures pétroliers (F2-F4); Hydrocarbures aromatiques polycycliques; Benzène, toluène, éthylbenzène, xylène; Glycole

	Identification de l'échantillon	Date Prélevé	Heure	Matrice	Hydrocarb. pétro. CCME F1 & BTEX	Hydrocarbures pétroliers (F2-F4)	Commentaires
1	B12-WA11	10/07/12		Sol	✓	✓	Report in English
2	B12-TBE01	"		"	✓	✓	
3	~~FB~~ B12-FBE01	"		"	✓	✓	
4	B12-FB03	"		"	✓	✓	7,7,6/5,4,6
5	B12-FB01	7/07/12		"	✓	✓	REÇU le 17 JUIL 2012 Rép: [illegible] 16:00
6	B12-TB02	11/07/12		"	✓	✓	
7	B12-TB03	11/07/12		"	✓	✓	
8							
9							
10							

REMIS PAR: (Signature) [signature] Date: 11/07/12

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BORDEREAU DE TRANSMISSION D'ÉCHANTILLONS

INFORMATION FACTURATION:		INFORMATION RAPPORT	INFORMATION PROJET:		À l'usage du laboratoire seulement:	
Compagnie	#536 CONSEIL NATIONAL DE RECHERCHE (CN	Compagnie	N° de cotation	A80022	# DOSSIER MAXXAM:	# COMMANDE BOUTEILLES
Attention de	David Juck	Attention de	N° de commande			78063
Adresse	6100, Royal Mount	Adresse	N° de projet		# CHAÎNE DE RESPONSABILITÉ:	CHARGÉ(S) DE PROJETS
	Montreal PQ H4P 2R2		Nom du projet	Eureka	C#78063-03-01	LORENA DI BENEDETTO
Téléphone	(514)496-6100 Téléc. (514)496-6265	Téléphone / Téléc.	# de site			
Courriel	david.juck@cnrc-nrc.gc.ca	Courriel	Échantillonneur	DJ & AM		

INSTRUCTIONS SPÉCIALES

ANALYSES REQUISES

DÉLAIS REQUIS

#	Identification de l'échantillon	Date Prélevé	Heure	Matrice	Hydrocarb. pétro. CCME F1 & BTEX	Hydrocarbures pétroliers (F2-F4)	Hydrocarbures aromatiques polycycliques	Benzène, toluène, éthylbenzène, xylène	Glycols	# de contenants	Commentaires
1	B12-NA01	10/07/12		Soil	✓	✓				2	Report in English
2	B12-NA02	"		"	✓	✓				2	
3	B12-NA03	"		"	✓	✓				2	
4	B12-NA04	"		"	✓	✓				2	7.7, 6 / 5.4, 6
5	B12-NA05	"		"	✓	✓				2	REÇU
6	B12-NA06	"		"	✓	✓				2	17 JUIL. 2012
7	B12-NA07	"		"	✓	✓				2	
8	B12-NA08	"		"	✓	✓				2	
9	B12-NA09	"		"	✓	✓				2	
10	B12-NA10	"		"	✓	✓				2	

Date: 11/07/12

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04-NOV-2013
Contaminated Sites Datasheet Report (PRIN:S-10527)

SITE GENERAL INFORMATION

Province
Nunavut

Base
CFS Eureka

Command
Air Command

Other Province

Area

Contamination Confirmed?
Yes

Is the site part of an FCSAP Project?
Yes

Property Type
Canada Lands

DGE Number

Other Number

PRIN Name (Internal Department Reference)
Eureka - North Airstrip Apron

Prin Name(French)
Eureka — Aire de trafic de la bande d'atterrissage du nord

Primary Reference PRIN

Primary Location Code

Affected Reference PRIN(s)

Location Code(s)

Location of Contamination on the Property (English)

Location of Contamination on the Property (French)

Location ID(s)

GPS Longitude
-85.840627

GPS Latitude
79.997711

DFRP Number	Federal Site Identifier	Creation Date	Last Update
	70069014	02-SEP-2004	12-APR-2012

PROPERTY INFORMATION

Reason for Federal Involvement
Other Canada Lands

Liable Federal Third Party (other than DND)

Liable Non-Federal Third Party

For Non-Federal Property

Owner

Owner Address

Non Federal Owner Type

LAND USE

Site Land Use
Industrial / Commercial

Surrounding Land Use
Industrial / Commercial

Legacy Site
No

Status
Under assessment

Status Date
10-APR-2008

Management Type
Additional Assessment
Other Management Type
Remediation

Contamination Source
Accidental fuel spill

Associated PRIN(s)

Corporate Priority

Base Priority
High

CCME NCS

Classification Rating
Action Likely Required (Class 2)

Total NCS Score
60

NCS Date
15-SEP-2009

NCS Year Version
2008

Rating Clarification

Scoring completed by DCC, Jenelle Ramnath

Classification Rating
Action Likely Required (Class 2)

Total NCS Score	NCS Date	NCS Year Version
59	10-JUL-2008	2008

Rating Clarification

Classification Rating
Action Required (Class 1)

Total NCS Score	NCS Date	NCS Year Version
73	27-NOV-2007	1992

Rating Clarification

Classification Rating
Action Likely Required (Class 2)

Total NCS Score	NCS Date	NCS Year Version
66	13-MAR-2007	1992

Rating Clarification

Classification Rating
Action Likely Required (Class 2)

Total NCS Score	NCS Date	NCS Year Version
53	31-JUL-2004	1992

Rating Clarification

FCSAP INFORMATION

FCSAP #	FCSAP Score	FCSAP Date
70069014		13-MAR-2007

Fiscal Year	Assessment Expenditure ($)	Remediation Expenditure ($)
2007-2008	18,071.72	0.00
2006-2007	4,468.24	0.00

AFFECTED MEDIA

Affected Media
Soil

Media Status
Confirmed

On-Site Receptors
Confirmed Ecological

Off-Site Receptors
Suspected

Contaminant Category
PHCs(petroleum hydrocarbons)
BTEXs(benzene, toluene, ethybenzene and xylene)
PAHs(polycyclic aromatic hydrocarbons)

Criteria Used to Assess Contamination
CCME Environmental Quality Guidelines
Canadian Wide Standards for Petroleum Hydrocarbons

Criteria Used to Develop Remediation Objectives
CCME Environmental Quality Guidelines(CCME Method 1)

Surpass Guidelines
Surpass Federal Guidelines

Estimated Extent of Contamination
1755 Cubic Meters

Extent of Remediation

Fiscal Year	Actual Extent

SPECIFIC CONTAMINANTS

Affected Media	Contaminant	Maximum Concentration
Soil	Total Petroleum Hydrocarbons (TPH)	16000 mg/kg
Soil	Benzene	6.4 mg/kg
Soil	Ethylbenzene	17.1 mg/kg
Soil	Toluene	48.8 mg/kg
Soil	Xylene	85.6 mg/kg
Soil	Naphthalene	36.5 mg/kg

PROJECT STEP INFORMATION

Project Step	Planned Fiscal Year	Status	Completion Fiscal Year	Planned Completion Date
Identify Suspect Sites	1999-2000	Completed	2006-2007	
Historical Review	1999-2000	Completed	2006-2007	
Initial Testing Program	2005-2006	Completed	2006-2007	
Classify Contaminated Site using the CCME NCS	2005-2006	Completed	2006-2007	
Detail Testing Program				
Reclassify Site using the CCME NCS				
Develop Remediation/Risk Management Strategy				04-APR-2013
Implement Remediation/Risk Management Strategy				04-APR-2013
Confirmatory Sampling and Final Reporting				04-APR-2013
Long Term Monitoring (Optional)				

Last Step Completed
Classify Contaminated Site using the CCME NCS

Action Plan
Further Assessment in FY12/13.

REPORTS & REFERENCES

Year	Title	Author	Reference Number	Comments
1999	Eureka: An Environmental Study of DND Facilities	Environmental Sciences Group, Royal Military College		

File Name (Attachment)

Year	Title	Author	Reference Number	Comments
2000	Eureka Delineation of Hydrocarbon Contaminated Soils 1999	Environmental Sciences Group, Royal Military College		

File Name (Attachment)

Year	Title	Author	Reference Number	Comments
2011	Arctic in situ bioremediation and site characterization: site work summaries	BRI	CTS-ALT-39A	

File Name (Attachment)

Year	Title	Author	Reference Number	Comments
2006	Characterization of Contaminated Sites: CFS Alert and CFS Eureka, Nunavut	Karine Drouin, Josée Sirois, Nancy Lee Fortin, Serge Delisle, Dave Juck		

File Name (Attachment)

ADDITIONAL INFORMATION & LINKED OBJECTS

Date	Provided By	Relevant to DFRP
12-APR-2012	Mr/Ms McRae, Chris	No

Title
Alert Proposal 12/13

Additional Information
Cost proposal/summary for CFS Alert works in FY 12/13, taken from the 11/12 report submission "Artic In Situ and Ex Situ Site Remediation at CFS Alert and Site Characterization at CFS Eureka".

File Name (Attachment)
Alert Proposal_12-13.doc

MONITORING WELLS

Well Number	Well Type	Diameter(m)	Depth(m)

Location Information

Notes/Comments
GPS
Longitude:
Latitude: