Appendix B

Historical Marine Sediment Sampling Programs

August 12, 2011

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Marine Sediment Sampling Program, Glace Bay Small Craft Harbour, Cape Breton Regional Municipality (CBRM), NS – Final Report – Including Low Level Detection Limits for Polycyclic Aromatic Hydrocarbons (PAHs), Results of Creosote/Coal Tar Resemblance and Sediment Leachate Results.

Dear Ms. Galante,

Dillon Consulting Limited (Dillon) is pleased to provide Public Works and Government Services Canada (PWGSC) – Environmental Services with the findings of a marine sediment sampling program (MSSP) undertaken at Glace Bay Small Craft Harbour, CBRM, Nova Scotia. The purpose of this program was to characterize the marine sediment within the harbour basin to facilitate decisions regarding the future management of dredged material from the harbour.

Scope and Methodology

The sediment sampling program was conducted on October 31, 2010, at Glace Bay Small Craft Harbour. As specified in the Terms of Reference (TOR), sediment samples were collected from two (2) areas; the inner harbour basin and the channel, six (6)samples plus a blind duplicate were collected within the basin area and three (3) samples were collected from the channel area (refer to Figures 1 and 2)

The sample collection, preparation, and analyses were conducted in accordance with Environment Canada's publication *Guidance Document on Collection and Preparation of Sediments for Physicochemical Characterization and Biological Testing, December 1994* and guidelines defined by provincial Occupational Health and Safety Standards. Scubatech Ltd., of Sydney, NS, was retained to collect the sediment samples.

Sample Area 1

PRIVATE WHARF

BOATS

FISH PLANT BUILDING

PRIVATE WHARF

RANGE LIGHT

CONCRETE LAUNCH RAMP

BOATS

PRIVATE WHARF

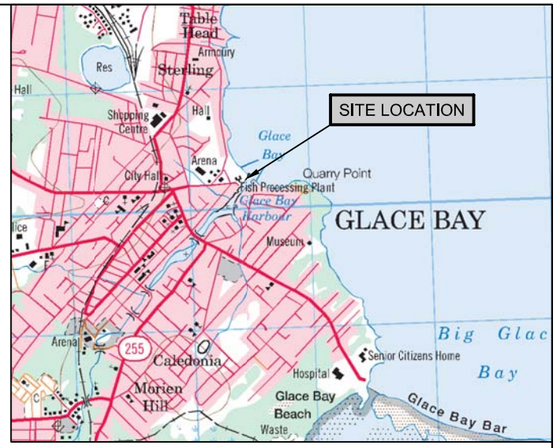
PRIVATE WHARF

PRIVATE WHARF

FISH PLANT

MARGINAL WHARF

RETAINING WALL



SITE LOCATION MAP

LEGEND

7m x 7m GRID

SAMPLE LOCATIONS

Sample Coordinates NAD 83 Longs/Lats		
Point	Longitude	Latitude
42	59 57 2.11	46 11 44.453
91	59 57 3.599	46 11 43.835
106	59 57 0.158	46 11 41.345
170	59 57 4.471	46 11 42.28
219	59 57 7.618	46 11 42.018
270	59 57 10.345	46 11 40.638

0 10 20 30 40 50m

SCALE 1:1000

DILLON CONSULTING

DATE OCTOBER 2010

TITLE **SEDIMENT SAMPLE LOCATIONS - SAMPLE AREA 1**

PROJECT **GLACE BAY, CAPE BRETON COUNTY, NS PWGSC**

PROJECT No. **10-3343**

FIGURE No. **1**

E 272 350

E 272 400

E 272 450

E 272 500

E 272 550

N 5 120 250

N 5 120 200

N 5 120 150

Sample Area 2

PUBLIC WHARF (MARGINAL)

TOE OF ARMOUR STONE

CONCRETE BREAKWATER

ARMOUR STONE

TOE OF BREAKWATER

C.H.S.87N9154

ARMOUR STONE

APPROXIMATE HIGH WATERLINE

STA.PARK

PUBLIC WHARF

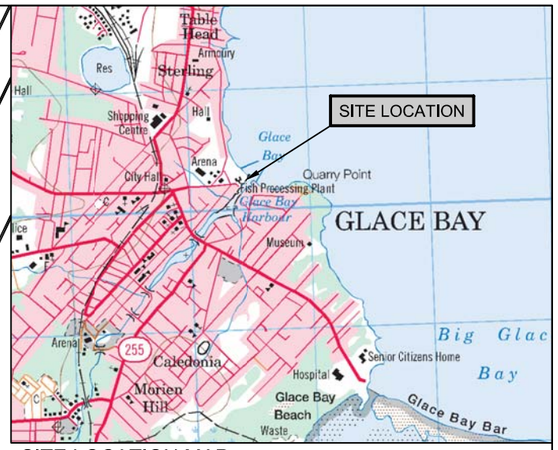
RANGE LIGHT

PRIVATE WHARF

FISH PLANT BUILDING

PRIVATE WHARF

BOATS



SITE LOCATION MAP

LEGEND

7m x 7m GRID

SAMPLE LOCATIONS

Sample Coordinates NAD 83 Longs/Lats		
Point	Longitude	Latitude
22	59 57 0.643	46 11 46.757
105	59 56 56.842	46 11 50.747
149	59 56 53.828	46 11 52.256

0 10 20 30 40 50m

SCALE 1:1000

DILLON CONSULTING

DATE OCTOBER 2010

TITLE **SEDIMENT SAMPLE LOCATIONS - SAMPLE AREA 2**

PROJECT **GLACE BAY, CAPE BRETON COUNTY, NS PWGSC**

PROJECT No. **10-3343**

FIGURE No. **2**

Diving services were conducted in accordance with the Canadian Standards Association (CSA) Standard *Z-275.2/92 Occupational Safety Code for Diving Operations*.

A Garmin 2 Plus™ Global Positioning System (GPS) was used to georeference the sampling locations. Dillon provided the divers the coordinates for each of nine (9) sample locations (including the blind field duplicate sample). The coordinates are listed in Table No. 1 as latitude and longitude (hdd°mm"ss') and UTM (Easting/Northing) (Datum: NAD83). A blind duplicate sample, called GB-Basin-Field Dup-Primary was collected from the harbour. It was arbitrarily collected at the same location as GB - Basin-1-PRIMARY and sent to the lab for analysis.

Table No. 1 Sampling Program Coordinates, Glace Bay, NS

Sample Point / Sample ID	Latitude	Longitude	UTM Easting Zone 21T	UTM Northing Zone 21T
42/GB-Basin-1-Primary	N46°11' 44.453"	W 59°57' 2.11"	272340	5120022
91/GB-Basin--2-Primary	N46°11' 43.835"	W 59°57' 3.599"	272307	5120064
106/GB-Basin--3-Primary	N46°11' 41.345"	W 59°57' 0.158"	272378	5119924
170/GB-Basin--4-Primary	N46°11' 42.28"	W 59°57' 4.471"	272287	5119957
219/GB-Basin--5-Primary	N46°11' 42.018"	W 59°57' 7.618"	272219	5119951
270/GB-Basin--6-Primary	N46°11' 40.638"	W 59°57' 10.345"	272159	5119911
GB-Basin-FIELD DUP-Primary (duplicate of GB-Basin-1-PRIMARY)	N46°11' 44.453"	W 59°57' 2.11"	272340	5120022
22/GB – Channel – 1-Primary	N46°11' 46.757"	W 59°57' 0.643"	272354	5120092
105GB – Channel – 2-Primary	N46°11' 50.747"	W 59°56'56.842"	271174	5120260
149/GB – Channel – 3-Primary	N46°11' 52.256"	W 59°56' 53.828"	272527	5120256

The marine surface sediment grab samples were collected by Scubatech Ltd. at the site. Once on station, the diver used a PVC tube to penetrate the substrate, as much as is practical, to a depth of 2.5 metres. The material was retrieved with the assistance of a winch and deposited into a bucket at the surface. The homogenized sample was then collected in laboratory supplied jars. As per laboratory protocol, two (2) 250 ml jars of

sediment were collected at each sample location. Duplicate samples were collected from each of the designated sampling locations to guard against sample loss during transportation.

Following sample collection, Dillon personnel delivered the samples to Maxxam Analytics Inc. (Maxxam) in Bedford, NS for select chemical analyses. Maxxam is an international standard ISO/IEC 17025 accredited laboratory certified by the Standards Council of Canada. Duplicate samples were stored at Maxxam for 30 days. At the request of PWGSC, the nine (9) sediment samples plus the blind field duplicate were analyzed for ICP 23 metals scan plus mercury and hexavalent chromium, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), benzene, toluene, ethylbenzene, and xylenes (BTEX), total petroleum hydrocarbons (TPH), creosote/coal tar resemblance, total dichloro-diphenyl-trichloroethane (DDT), total inorganic carbon/total organic carbon (TIC/TOC), and grain size. Select sediment samples were also analyzed for benzene, PAH and metals (low level detection limits) in leachate following the USEPA Method 1312 "Synthetic Precipitate Leaching Procedure" (SPLP). Select samples were also subject to toxicity characterization leaching procedure (TCLP) and SPLP for metals.

To identify future disposal requirements, the analyzed marine samples were compared to soil (land based disposal) guidelines. The PAH parameters for land based disposal were compared to the 2010 environmental and human health guidelines for PAH applications including:

- CCME Soil Quality Guidelines (SQGs) for the protection of potable water;
- CCME Index of Additive Cancer Risk (IACR) Guideline;
- CCME SQGs for the protection of freshwater life; and,
- CCME SQGs for the protection of Environmental Health for agricultural, residential/parkland, and commercial/industrial applications.

Analysis of the ICP 23 metals scan plus mercury and hexavalent chromium, PCBs, and total DDT, were compared to the CCME SQGs for agricultural, residential/parkland, and commercial/industrial applications. Analysis was also conducted to determine TIC/TOC and grain size parameters for each sample. These parameters are useful in determining the suitability for ocean disposal. The BTEX/TPH results were compared with the Atlantic RBCA Version 2.0 Tier 1 Risk-Based Screening Levels (RBSLs) and the CCME SQGs for surface soils for potable water on agricultural, residential/parkland, commercial, and industrial sites.

Following receipt of the petroleum hydrocarbon results, it was determined that in order to distinguish non-petrogenic carbon (i.e. naturally occurring plant or animal based carbon) from petroleum hydrocarbons, the backup samples would be re-analyzed with a silica gel clean up procedure to strip out the non-petrogenic based carbon before testing.

Sediment Sampling Analytical Results

The analytical results of the nine (9) marine sediment samples and blind field duplicate obtained at the Glace Bay Small Craft Harbour (SCH) are summarized below for those parameters for which there are established regulatory guidelines. Results tables are provided in Attachment A. The complete set of analytical results, laboratory QA/QC, and Certificates of Analyses for all parameters tested are provided in Attachment B.

- **PAH Concentrations**

  - **CEPA Ocean Disposal Guidelines – Atlantic Region**
    The CEPA Ocean Disposal Guidelines for the Atlantic Region have a total PAH limit of 2.5 mg/kg. With the exception of GB-CHANNEL- 2-PRIMARY, all of the samples collected from the Glace Bay SCH (including the lab and field duplicates) exceeded this Guideline. Refer to Attachment A, Table No. 2 for additional details.

  - **CCME Marine and Estuarine Sediment Probable Effects Levels (PELs)**
    There were exceedances of the above guideline for multiple PAH parameters in all samples collected at Glace Bay SCH with the exception of GB-BASIN-1-PRIMARY, GB-CHANNEL-1-PRIMARY and GB-CHANNEL-2-PRIMARY. Refer to Attachment A, Table No. 2 for additional details.

  - **CCME Soil Quality Guidelines (SQGs) – Agricultural, Residential/Parkland, Commercial or Industrial Land Use**

    - *Soil Quality Guideline for the Protection of Potable Water (SQG_{PW})*
      All samples collected from Glace Bay SCH (including the lab and field duplicates) exceeded the potable water guidelines. The index of additive cancer risk (IACR) calculated from the concentrations of carcinogenic PAHs exceeded the potable criteria in all nine (9) samples collected from Glace Bay SCH. Refer to Attachment A, Table No. 2 for additional details.

    - *Soil Quality Guideline for Human Health (SQG_{HH}) based on CCME Soil Direct Contact (ingestion, inhalation and dermal exposures) Guidelines for the Protection of Human Health (CCME, 2008)*
      The sum of Benzo[a]pyrene Total Potency Equivalents (B(a)P TPEs) (calculated from the concentrations of potentially carcinogenic PAHs and their respective Benzo[a]pyrene Potency Equivalence Factors (B(a)P PEFs)) for the sediment samples collected from the harbour did not exceed the SQG_{HH} guideline for each of the samples analyzed. Refer to Attachment A, Table No. 2 for additional details.

Each sediment sample was analyzed for potential resemblance to creosote (or coal tar). The chromatogram analysis indicated that creosote was not present in the samples analyzed. Refer to Attachment B for additional details.

- *Soil Quality Guideline for the protection of Environmental Health (SQG_E)*
  PAH concentrations in the sediment samples collected at the Glace Bay Small Craft Harbour did not exceed the SQG_E guideline (for the compounds for which there are guidelines) for agricultural, residential/parkland, commercial and industrial land use for each of the samples analyzed. Refer to Attachment A, Table No. 2 for additional details.

- *Soil Quality Guidelines for Agricultural and Residential/Parkland Soil and Food Ingestions (SQG_I).*
  PAH concentrations in the sediment samples collected at the harbour did not exceed the SQG_I guideline for each of the samples analyzed. Refer to Attachment A, Table No. 2 for additional details.

- *Interim Soil Quality Criteria (ISQC).*
  PAH concentrations in all of the samples (including the lab and field duplicates) analyzed exceeded the ISQC environmental criteria for multiple parameters based on agricultural land use only. There were no ISQG exceedances to the Residential Parkland, Industrial or Commercial land use criteria. Refer to Attachment A, Table No. 2 for additional details.

- *Soil Quality Guideline for the protection of Freshwater Life (SQG_{FL})*
  PAH concentrations in all sediment samples collected from Glace Bay SCH (including the lab and field duplicates) exceeded the SQG_{FL} guideline for Naphthalene and Phenanthrene with the exception of GB-CHANNEL-3-PRIMARY which exceeds the SQGFL guideline for Phenanthrene only. Refer to Attachment A, Table No. 2 for additional details.

➢ SPLP Leachate

Four (4) back up samples corresponding to the primary samples exhibiting the highest PAH exceedances were selected for leachate testing to determine if the leachable concentrations would impact potable water supplies following on-land disposal. The four samples were GB-BASIN-3-BACK UP, GB-BASIN-5-BACK UP, GB-Channel-1-BACK UP, and GB-CHANNEL-3-BACK UP.

- *CCME/Health Canada - Potable Water*
  PAH concentrations in the leachate water samples were below the Canadian Guideline for Drinking Water Quality (CGDWQ) for all PAHs.

  CGDWQ values currently exist only for benzo(a)pyrene; however, potable "Source Guidance Values for Groundwater" (SGVGs) exist for other PAHs as presented in Table 7. These values were extracted from the scientific support document for PAHs in soil (CCME, 2010) Table 7-3, page 135. In this regard, PAH concentrations in the leachate water samples were below the SGVGs and generally below the detection limits. Refer to Attachment A. Table No. 7 for additional details.

- *CCME Freshwater and Marine Aquatic Life (FWAL and MAL)*
  PAH concentrations in the leachate water samples exceeded the CCME Freshwater Aquatic Life (FWAL) guidelines for Anthracene in each of the samples analyzed. The concentrations of Fluoranthene and Pyrene exceeded the CCME FWAL guidelines in GB-BASIN-3-BACK UP and GB-BASIN-5-BACK UP. There were no exceedances of the Marine Aquatic Life Guidelines (MAL) in the samples analyzed. Refer to Attachment A. Table No. 7 for additional details.

- **Metal Concentrations**

Samples collected from the Glace Bay Small Craft Harbour were tested for available metals and the analytical results were compared to the established CCME SQGs for agriculture, residential/parkland, and commercial/industrial land use applications as well as the CEPA Ocean Disposal Guidelines and Marine Sediment Probable Effects Levels. Refer to Attachment A, Table No. 3 for additional details.

➢ **CEPA Ocean Disposal Guidelines – Atlantic Region**

The concentration of Cadmium exceeded the CEPA Ocean Disposal Guidelines (ODGs) in **all** of the samples collected at Glace Bay SCH with the **exception** of GB-BASIN-6-PRIMARY and GB-CHANNEL-3-PRIMARY. The concentration of Copper exceeded the CEPA ODGs in GB-BASIN-2-PRIMARY, GB-BASIN-3-PRIMARY, GB-BASIN-4-PRIMARY and GB-BASIN-5-PRIMARY. The concentrations of Lead and Zinc exceeded the CEPA ODGs in GB- BASIN-2-PRIMARY, GB- BASIN-3-PRIMARY, GB-BASIN-4-PRIMARY and GB-BASIN-5-PRIMARY.

➢ **CCME Marine Sediment Probable Effects Levels (PELs)**

The CCME Marine Sediment PELs were exceeded for Copper in samples GB-BASIN-3-PRIMARY, GB-BASIN-4-PRIMARY and GB-BASIN-5-PRIMARY. The concentration of Lead in GB-BASIN-5-PRIMARY also exceeded the CCME Marine Sediment PELs.

➢ **CCME Soil Quality Guidelines (SQGs)**

The concentration of Arsenic and Copper and Zinc exceed the CCME SQGs for agricultural, residential/parkland and commercial land use in samples GB-BASIN-3-PRIMARY, GB-BASIN-4-PRIMARY, and GB-BASIN-5-PRIMARY. Sample GB-BASIN-2-PRIMARY also exceeds the SQGs for Copper in agricultural and residential/parkland land uses. Sample GB-BASIN-5-PRIMARY exceeds the SQGs for Selenium in agricultural and residential/parkland land uses, and GB-BASIN-6-PRIMARY exceeds CCME SQGs in agricultural, residential/parkland and commercial land use for arsenic.

➢ **Metal Leachate Results**

Following review of the metals results, the back up samples GB-BASIN-2-BACK UP, GB-BASIN-3-BACK UP, GB-BASIN-4-BACK UP, GB-BASIN-5-BACK UP and GB-BASIN-6-BACK UP were submitted for SPLP leachate analysis to determine the likelihood that water leaching from the dredge spoils would impact potable water and aquatic life. The analysis was conducted using the lowest possible reportable detection limits. At the request of PWGSC, the samples from Glace Bay Basin were also submitted for TCLP leachate analysis and the results compared to the Nova Scotia Guidelines for Disposal of Contaminated Solids in Landfills in the event that landfill disposal was required.

Due to the amount of material remaining; samples GB-BASIN-4- BACK UP and GB-BASIN-5-BACK UP were combined as the primary metals results were similar. There was insufficient material to submit GB-BASIN-6 for TCLP analysis.

SPLP Leachate

- Metal concentrations in the leachate water was compared to the following guidelines CCME Water Quality Guidelines (WQGs) for the Protection of Aquatic Life for Freshwater and Marine life and the Health Canada Canadian Drinking Water Quality Guidelines (CDWQGs) for maximum acceptable concentrations (MAC) and aesthetic objectives (AO).

- *CCME WQGs for the Protection of Aquatic Life – (FWAL and MAL)*
  Four (4) samples were submitted for leachate analysis based on the original exceedances. The concentration of Aluminium in the leachate water from all four samples exceeded the CCME FWAL WQGs. Sample GB-BASIN-6-BACK UP also exceeded the CCME FWAL WQGs for Arsenic, Cadmium, Chromium, Cobalt, Copper, and Lead. The combined sample GB-BASIN-4 and GB-BASIN-5 BACK UP also exceeded the CCME FWAL WQGs for Chromium. Sample GB-BASIN-2 BACK UP exceeded the CCME Freshwater WQGs for Molybdenum. Refer to Attachment A, Table No. 9 for additional details. The CCME MAL WQGs were not exceeded in any of the leachate water samples. Refer to Attachment A, Table No. 9 for additional details.

- *Canadian Drinking Water Quality Guidelines – Maximum Acceptable Concentrations*
  The leachate water from sample GB-BASIN-6-BACK UP exceeded the CDWQGs MAC for Arsenic. Refer to Attachment A, Table No. 9 for additional details.

- *Canadian Drinking Water Quality Guidelines – Aesthetic Objectives*
  The leachate water from sample GB-BASIN-6 BACK UP exceeded the CDWQGs –AO for Iron and the leachate water from sample GB-BASIN-2-BACK UP exceeded the CDWQGs –AO for Sodium. Refer to Attachment A, Table No. 9 for additional details.

TCLP Leachate
The concentration of metals in the leachate water from the above samples was below the Nova Scotia Guidelines for Disposal of Contaminated Solids in Landfills for those metals with applicable guidelines. Refer to Attachment A, Table No. 10 for additional details.

The concentrations of metals in the sediment samples collected at Glace Bay Small Craft Harbour exceeds the CEPA Ocean Disposal Guidelines, Marine Probable Effects levels and the CCME SQGs for agricultural, residential/parkland and commercial land use.

The leachate water extracted from the sediment collected at Glace Bay Small Craft Harbour exceeds the CCME Water Quality Guidelines (WQGs) for the Protection of Aquatic Life for Freshwater Life and the Health Canada Canadian Drinking Water Quality Guidelines (CDWQGs) for maximum acceptable concentrations (MAC) and aesthetic objectives (AO). The leachate water extracted from the sediment collected from Glace Bay Small Craft Harbour is below the Nova Scotia Guidelines for Disposal of Contaminated Solids in Landfills

- **Petroleum Hydrocarbons**

As noted above, the back up sediment samples collected from Glace Bay Small Craft Harbour were tested for petroleum hydrocarbons (i.e., BTEX/TPH) after applying a silica gel clean up process to the samples to strip out the non-petrogenic organic material. The samples were also analysed for total oil and grease (F4G analysis). The analytical results were compared to the established Atlantic RBCA Version 2.0 Tier 1 RBSLs User Guidance and the CCME SQGs for potable water on agricultural, residential/parkland, commercial, and industrial sites. Refer to Attachment A, Table No. 4 for additional details.

These samples had a fuel and/or lube (L, FL) resemblance and were subsequently compared to the appropriate diesel and/or lube oil range guidelines. Sample GB-Channel-3-BACK UP had a fuel fraction (F) resemblance and was subsequently compared to the appropriate fuel oil range guidelines. Each of the samples and the blind field duplicate were above the CCME SQGs for agricultural and residential/parkland land uses in fine-grained sediments but were below the commercial and industrial land use guidelines. Refer to Attachment A, Table No. 4 for the summary of the analytical data.

Benzene concentrations exceeded the Atlantic RBCA Version 2.0 Tier 1 RBSLs for residential and commercial potable land use in coarse and fine-grained sediment in all of the samples submitted. Ethylbenzene concentrations exceeded the Atlantic RBCA Version 2.0 Tier 1 RBSLs for residential and commercial potable land use in fine-grained sediment in sample GB-BASIN-3-BACK UP.

The modified TPH levels were compared to the Atlantic RBCA Version 2.0 Tier 1 RBSLs in the fuel range (Diesel #2) as this is the more conservative guideline based on the resemblance. The samples generally exceeded the Atlantic RBCA Version 2.0 Tier 1 RBSLs residential potable and non-potable guidelines for fine and coarse-grained sediment as well as the guideline for commercial potable for fine-grained sediment.

With the exception of GB-BASIN-6-BACK UP, samples collected from the basin area generally exceeded the CCME SQGs for the F2 fraction (C_{10}-C_{16}).

The samples generally exceeded the CCME SQGs for the F3 fraction (C_{16}-C_{32}) with the exception of GB-BASIN-6-BACK UP and GB-CHANNEL-3-BACK UP.

The results of the F4G analysis for total oil and grease indicated exceedances of the CCME SQGs in all land use applications for fine and coarse-grained sediment in all samples with the exception of GB-BASIN-6-BACK UP and GB-CHANNEL-3-BACK UP.

The back-up samples corresponding to GB-BASIN-2-PRIMARY, GB-BASIN-4-PRIMARY, GB-BASIN-5-PRIMARY and GB-CHANNEL-3-PRIMARY were submitted for leachate analysis for BTEX at the request of PWGSC. BTEX was not detected in the leachate water following extraction. Refer to Attachment A, Table No. 8 for the summary of the analytical data.

Based on the analytical data for petroleum hydrocarbons, the sediment meets the Atlantic RBCA Version 2.0 Tier 1 RBSLs for commercial non-potable use for fine-grained soil. The sediment generally exceeds the CCME SQGs for surface soils for petroleum hydrocarbons in all land uses in fine and coarse -grained soils.

- **PCB Concentrations**

PCBs were detected above the reportable laboratory detection limits in four (4) sediment samples (GB-BASIN-1-PRIMARY, GB-BASIN-2-PRIMARY, GB-BASIN-3-PRIMARY and GB-BASIN-4-PRIMARY) however the concentrations were below the CCME SQGs for agricultural, residential/parkland and commercial industrial land uses. Refer to Attachment A, Table No. 5 for additional details.

- **Carbon Content**

Laboratory analytical results of the sediment samples (plus the lab and field duplicate samples) collected from Glace Bay Small Craft Harbour, indicate total carbon was reported as ranging between 43–110 g/kg, total inorganic carbon ranging between 3.9–17 g/kg, and total organic carbon ranging between 38–83 g/kg. Refer to Attachment A, Table No. 5 for additional details.

- **Sediment Grain Size**

The laboratory determined that the grain size distribution of the sediment samples collected from Glace Bay Small Craft Harbour were predominantly silt (32%-64%) with lesser amounts of clay (15%-31%), sand (11%-39%), and gravel (absent to 4.3%). Refer to Attachment A, Table No. 6 for a summary of the grain size distribution.

Quality Assurance/Quality Control

Samples were taken to the laboratory by Dillon personnel during the course of the sample collection program. Each sample collected was tagged on site and marked with a waterproof marker with the date, sample site identifier, and sample number. The samples were placed upright on ice inside a cooler for safe storage and transport.

As per Dillon's internal review policy, a technical project reviewer, Mr. Brad MacLean, was established at the outset of the project. This individual reviewed this report prior to its release in accordance with Dillon's Quality Assurance/Quality Control requirements.

Summary

The PAH concentrations in the marine sediments exceeded CEPA Ocean Disposal Guidelines, CCME Sediment Criteria for Marine and Estuarine Probable Effects Levels, CCME Soil Quality Guidelines for Potable Water and Freshwater Life. The sediments exceed the Interim Soil Quality Guidelines for Agricultural land use. Following leachate analysis for PAHs, it was determined that the sediment meets the Canadian Guideline for Drinking Water Quality. Following leachate analysis for PAHs, it was determined that the sediment meets the Canadian Guidelines for Drinking Water Quality, but exceeded CCME Freshwater Aquatic Life (FWAL) guidelines

The concentrations of metals in the sediment samples collected at Glace Bay Small Craft Harbour exceeds the CEPA Ocean Disposal Guidelines, Marine Probable Effects levels and the CCME SQGs for agricultural, residential/parkland and commercial land use.

The leachate water extracted from the sediment collected at Glace Bay Small Craft Harbour exceeds the CCME Water Quality Guidelines (WQGs) for the Protection of Aquatic Life for Freshwater Life and the Health Canada Canadian Drinking Water Quality Guidelines (CDWQGs) for maximum acceptable concentrations (MAC) and aesthetic objectives (AO). The leachate water extracted from the sediment collected at Glace Bay Small Craft Harbour is below the Nova Scotia Guidelines for Disposal of Contaminated Solids in Landfills.

Based on the analytical data for petroleum hydrocarbons, the sediment meets the Atlantic RBCA Tier 1 RBSLs for commercial potable and non-potable use for fine-grained soil and the CCME SQGs for surface soils for petroleum hydrocarbons in commercial and industrial use with fine-grained soils.

The leachate results for BTEX were below the detection limits and the Canadian Drinking Water Quality Guidelines for maximum acceptable concentrations and aesthetic objectives.

Closing

Dillon appreciates the opportunity to provide services to your organization. Please do not hesitate to call if you have any questions regarding this, or any other matter.

Yours truly,

DILLON CONSULTING LIMITED

Scott McMillan
Project Manager

SCM:jep
Attachments
Our File: 10-3343-8000

ATTACHMENT A

Results Tables

Table 2 - PAH Concentrations in Soil, Glace Bay Small Craft Harbour, Nova Scotia

Parameter	CEPA Ocean Disposal Guidelines Atlantic Region (mg/kg)	CCME Sediment Criteria[2] Marine and Estuarine PELs[2] (mg/kg)	CCME PAH Soil Guidelines[1]								Sample Concentrations (mg/kg)										
			CCME SQG_{HH}		CCME SQG_E[5]																
			CCME SQG_{PW}[3] (mg/kg)	CCME SQG_{DC}[4] (mg/kg)	SQG_{SC} Agr / Res Park (mg/kg)	SQG_{SC} Com/Ind (mg/kg)	SQG_I[6] Agr / Res Park (mg/kg)	ISQC[9] Agr / Res Park (mg/kg)	ISQC[9] Com/Ind (mg/kg)	SQG_{FL}[7] (mg/kg)	GB-BASIN-1-PRIMARY Depth Date	GB-BASIN-2-PRIMARY Depth Date	GB-BASIN-3-PRIMARY Depth Date	GB-BASIN-4-PRIMARY Depth Date	GB-BASIN-5-PRIMARY Depth Date	GB-BASIN-6-PRIMARY Depth Date	GB-BASIN-6-PRIMARY Lab-Dup Depth Date	GB-BASIN-Field Duplicate-PRIMARY Depth Date	GB-CHANNEL-1-PRIMARY Depth Date	GB-CHANNEL-2-PRIMARY Depth Date	GB-CHANNEL-3-PRIMARY Depth Date
1-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	0.11	0.25	0.17	0.24	0.20	0.059	0.056	0.087	0.082	0.090	0.12
2-Methylnaphthalene	-	**0.201**	-	-	-	-	-	-	-	-	0.12	**0.32**	**0.23**	**0.35**	**0.27**	0.058	0.063	0.096	0.10	0.083	0.13
Acenaphthene *	-	**0.0889**	-	-	-	-	21.5	-	-	0.28	0.036	0.082	**0.21**	**0.16**	**0.12**	**0.14**	**0.18**	0.043	0.024	0.045	0.067
Acenaphthylene *	-	**0.128**	-	-	-	-	-	-	-	320	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.010	0.015	< 0.005	0.005	< 0.005	< 0.005
Anthracene *	-	**0.245**	-	-	2.5	32	61.5	-	-	-	0.23	0.17	0.17	0.16	**0.26**	**0.31**	**0.31**	0.18	0.083	0.17	0.29
Benzo(a)anthracene *	-	**0.693**	*0.33*	-	-	-	6.2	0.1 / 1	10	-	0.20	*0.33*	*0.42*	*0.52*	*0.59*	*0.36*	*0.45*	0.24	0.20	0.13	0.16
Benzo(a)pyrene *	-	**0.763**	*0.37*	-	20	72	0.6	0.7[10]	1.4[10]	8800	0.17	0.28	0.25	0.35	*0.42*	0.26	0.30	0.21	0.19	0.081	0.13
Benzo(b)fluoranthene *	-	-	*0.16*	-	-	-	6.2	0.1 / 1	10	-	*0.19*	*0.28*	*0.36*	*0.48*	*0.47*	*0.25*	*0.19*	*0.21*	*0.18*	0.071	0.095
Benzo(g,h,i)perylene *	-	-	*6.8*	-	-	-	-	-	-	-	0.11	0.18	0.17	0.26	0.29	0.15	0.17	0.14	0.11	0.059	0.062
Benzo(j)fluoranthene *	-	-	*0.16*	-	-	-	6.2	0.1 / 1	10	-	0.14	*0.21*	*0.22*	*0.33*	*0.32*	*0.18*	*0.19*	0.16	0.15	0.076	0.092
Benzo(k)fluoranthene *	-	-	*0.034*	-	-	-	6.2	0.1 / 1	10	-	*0.15*	*0.18*	*0.22*	*0.25*	*0.25*	*0.16*	*0.15*	*0.14*	*0.13*	*0.059*	*0.076*
Chrysene *	-	**0.846**	*2.1*	-	-	-	6.2	-	-	-	0.25	0.40	0.36	0.59	0.59	0.32	0.41	0.25	0.23	0.16	0.19
Dibenz(a,h)anthracene *	-	**0.135**	*0.23*	-	-	-	-	0.1 / 1	10	-	0.027	0.047	0.032	0.081	0.035	0.045	0.052	0.037	0.028	< 0.005	< 0.005
Fluoranthene *	-	**1.494**	-	-	50	180	15.4	-	-	-	0.64	1.0	**2.0**	**1.6**	**1.6**	1.4	**2.2**	0.66	0.47	0.39	0.58
Fluorene *	-	**0.144**	-	-	-	-	15.4	-	-	0.25	0.057	0.14	**0.23**	**0.22**	**0.18**	0.13	**0.18**	0.066	0.036	0.059	0.092
Indeno(1,2,3-cd)pyrene *	-	-	*2.7*	-	-	-	-	0.1 / 1	10	-	0.094	*0.15*	0.15	0.24	0.29	0.15	0.17	**0.12**	0.12	0.054	0.062
Naphthalene *	-	**0.391**	-	-	-	-	8.8	0.6[10]	22[10]	0.013	0.12	0.22	0.13	0.21	0.16	0.086	0.11	0.092	0.089	0.12	0.15
Perylene	-	-	-	-	-	-	-	-	-	-	0.042	0.096	0.21	0.29	0.18	0.26	0.25	0.056	0.052	< 0.005	0.023
Phenanthrene *	-	**0.544**	-	-	-	-	43	0.1 / 5	50	0.046	0.49	**1.0**	**0.97**	**1.4**	**1.2**	**0.58**	**0.68**	0.54	0.33	0.42	**0.68**
Pyrene *	-	**1.398**	-	-	-	-	7.7	0.1 / 10	100	-	0.50	0.77	1.4	1.2	1.3	1.2	2.1	0.52	0.34	0.30	0.43
Total PAH (calculated)	2.5	-	-	-	-	-	-	-	-	-	3.4	5.4	7.3	8.1	8.1	5.7	7.9	3.6	2.7	2.2	3.2
Index of Additive Cancer Risk (IACR)[8]	-	-	**1**	-	-	-	-	-	-	-	**7.8**	**10.6**	**12.4**	**15.7**	**15.8**	**9.6**	**9.5**	**8.1**	**7.3**	**3.4**	**4.4**
Creosote or Coal Tar source suspected/known?											No	No	No	No	No	No	No	No	No	No	No
Uncertainty Factor Applied											1	1	1	1	1	1	1	1	1	1	1
B(a)P TPE[8]	-	-	-	**5.3**	-	-	-	-	-	-	0.3	0.4	0.4	0.6	0.7	0.4	0.5	0.3	0.3	0.1	0.2

[1] Canadian Council of Ministers of the Environment (CCME), Canadian Soil Quality Guidelines (SQG) for the Protection of Environmental and Human Health:Polycyclic Aromatic Hydrocarbons (PAHs), revised 2010.

[2] PELs - Probable Effects Levels for CCME Sediment Quality Guidelines for the Protection of Aquatic Life, 1999.

[3] SQG_{PW} Soil Quality Guideline for human health based on CCME Index of Additive Cancer Risk (IACR) guidelines for the protection of human health (CCME, 2010)

[4] SQG_{DC} Soil Quality Guideline for human health based on CCME soil direct contact (ingestion, inhalation and dermal exposures) guidelines for the protection of human health based on a 10^{-5} incremental lifetime cancer risk (CCME, 2010)

[5] SQG_E - Soil Quality Guideline for the protection of Environmental Health

[6] SQG_I - Soil Quality Guideline for the protection of Environmental Health soil and food ingestion.

[7] SQG_{FL} - Soil Quality Guideline for freshwater life protection back-calculated based on CCME (2006) protocol, using pre-existing CCME Water Quality Guidelines (Freshwater Life) (CCME 1999)

[8] When applicable half of the value of the detection limit was used to calculate B(a)P TPE and IACR.

[9] ISQC - Interim Soil Quality Criteria CCME 1991

[10] Provisional SQG_E CCME 1997

* - PAH is included in "Total" PAH (calculated)

"-" denotes no guideline available.

B(a)P TPE = Benzo[a]pyrene Total Potency Equivalent calculated based on the sum of B(a)P PEF multiplied by the carcinogenic PAH concentrations.

```
B(a)P PEFs = Benzo[a]pyrene Potency Equivalence Factors:
      Benzo(a)anthracene      PEF = 0.1      Benzo(a)pyrene          PEF = 1.0
      Benzo(b)fluoranthene    PEF = 0.1      Benzo(g,h,i)perylene    PEF = 0.01
      Benzo(k)fluoranthene    PEF = 0.1      Chrysene                PEF = 0.01
      Indeno(1,2,3-cd)pyrene  PEF = 0.1      Dibenz(a,h)anthracene   PEF = 1.0
```

IACR = Index of Additive Cancer Risk

< #.### = Less than Laboratory Estimated Quantification Limit (EQL) at noted detection limit of #.###.

Bold values indicate CCME exceedances.

RED values indicate CCME PAH Soil B(a)P TPE Human Health exceedances.

BLUE values indicate CCME PAH Soil IACR Human Health Potable exceedances.

Table 3 - Metal Concentrations in Soil, Glace Bay Small Craft Harbour, Nova Scotia

Parameter	CEPA Ocean Disposal Guidelines-Atlantic Region (mg/kg)	CCME Marine Sediment Probable Effects Levels (mg/kg)	CCME Soil Quality Guidelines[1]			Sample Concentration (mg/kg)											
			Agricultural (mg/kg)	Residential/ Parkland (mg/kg)	Commercial (mg/kg)	GB-BASIN-1-PRIMARY	GB-BASIN-2-PRIMARY	GB-BASIN-3-PRIMARY	GB-BASIN-4-PRIMARY	GB-BASIN-5-PRIMARY	GB-BASIN-6-PRIMARY	GB-BASIN-FIELD DUPLICATE-PRIMARY	GB-BASIN-FIELD DUPLICATE-PRIMARY Lab-Dup	GB-Channel-1-PRIMARY	GB-Channel-2-PRIMARY	GB-Channel-3-PRIMARY	GB-CHANNEL-3-PRIMARY Lab-Dup
						Available	Available	Available	Available	Available	Available	Available		Available	Available	Available	Available
Aluminum (Al)	-	-	-	-	-	12000	13000	9800	13000	12000	9400	13000		11000	9200	8400	8800
Antimony (Sb)	-	-	20	20	40	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND
Arsenic (As)	-	**41.6**	12	12	12	10	11	16	13	19	14	10		10	10	8	8
Barium (Ba)	-	-	750	500	2000	99	120	100	140	120	60	99		99	82	66	68
Beryllium (Be)	-	-	4	4	8	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND
Bismuth (Bi)			-	-	-	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND
Boron (B)			-	-	-	30	30	18	29	35	17	31		32	40	24	30
Cadmium (Cd)	0.6	**4.2**	1.4	10	22	0.8	0.9	0.8	1.3	1.0	ND	0.9		0.9	0.9	0.5	0.6
Chromium (Cr)	-	**160**	64	64	87	26	27	21	27	28	23	29		25	22	19	18
Cobalt (Co)	-	-	40	50	300	15	15	14	15	14	19	17		14	12	12	11
Copper (Cu)	81*	**108**	63	63	91	56	89	**130**	**220**	**200**	36	64		50	41	33	32
Iron (Fe)	-	-	-	-	-	31000	36000	30000	36000	37000	34000	34000		31000	29000	26000	28000
Lead (Pb)	66*	**112**	70	140	260	38	70	76	110	**130**	49	42		31	23	19	19
Lithium (Li)			-	-	-	25	29	24	27	27	25	30		24	20	19	18
Manganese (Mn)	-	-	-	-	-	580	570	390	500	470	300	620		590	590	560	590
Mercury (Hg)	0.75	**0.70**	6.6	6.6	24	0.3	0.2	0.2	0.5	0.6	0.2	0.1		0.1	0.1	0.1	0.1
Molybdenum (Mo)	-	-	5	10	40	5	6	7	9	6	4	8		4	5	6	6
Nickel (Ni)	-	-	50	50	50	33	34	27	34	31	31	37		30	29	26	24
Rubidium (Rb)			-	-	-	12	13	8	12	11	9	13		13	11	10	10
Selenium (Se)	-	-	1	1	2.9	ND [2]	ND [2]	2	ND [2]	ND [2]	1	ND [2]		ND [2]	ND [2]	ND [2]	ND [2]
Silver (Ag)	-	-	20	20	40	0.5	1.3	4.0	3.6	2.1	ND	0.5		ND	ND	ND	ND
Strontium (Sr)	-	-	-	-	-	55	63	46	73	60	26	59		48	100	51	50
Thallium (Tl)	-	-	1	1	1	0.5	0.4	0.3	0.5	0.3	0.2	0.4		0.3	0.3	0.3	0.3
Tin (Sn)	-	-	5	50	300	5	8	11	15	13	7	4		3	3	3	3
Uranium (U)	-	-	23	23	33	1.3	1.4	1.5	1.5	1.4	1.0	1.8		1.1	1.2	1.3	1.3
Vanadium (V)	-	-	130	130	130	38	36	27	34	39	25	42		35	32	27	25
Zinc (Zn)	160*	**271**	200	200	360	140	180	220	250	240	120	160		140	110	85	87
Mercury (Hg)*	0.75	**0.70**	6.6	6.6	24	0.05	0.13	0.30	0.29	0.67	0.13	0.04	0.05	0.03	0.02	0.02	
Chromium (VI)	-	-	0.4	0.4	1.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2	<0.2	
Date Collected						13-Oct-2010	13-Oct-2010	13-Oct-2010	13-Oct-2010	13-Oct-2010	13-Oct-2010	13-Oct-2010	13-Oct-2010	13-Oct-2010	13-Oct-2010	13-Oct-2010	13-Oct-2010

* Analysed by Cold Vapour AA

'NA' denotes parameter not analyzed

[1] denotes Canadian Environmental Quality Guidelines, revised 2007

[2] denotes elevated reporting limit due to sample matrix. Reporting limit exceeds CCME SQG (agricultural and residential/parkland) for Selenium.

"L/D" denotes laboratory duplicate.

"F/D" denotes field duplicate.

Left Justified Values indicate CCME Soil Quality Guidelines for Agricultural Application exceedances.

Shaded Values indicate CCME Soil Quality Guidelines for Residential/Parkland Application exceedances.

Interrupted Boxed Values indicate CCME Soil Quality Guidelines for Commercial/Industrial Application exceedances.

Bold values indicate CCME Marine Sediment Probable Effects Level exceedance

Underline values denotes CCME Ocean Disposal Guidelines exceedance

Table 4 - BTEX/TPH Concentrations in Sediment, Glace Bay Small Craft Harbour, Nova Scotia

Sample Identification	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	F1 [6] (C_6-C_{10}) (mg/kg)	F2 [6] (C_{10}-C_{16}) (mg/kg)	(C_{16}-C_{21}) (mg/kg)	C_{21}-C_{32} (mg/kg)	F3 [6] (C_{16}-C_{32}) (mg/kg)	Modified TPH[1]	Resemblance
GB-BASIN-1-BACK UP	13-Oct-10	0.062	ND	ND	ND	<3	160	210	600	810	1000	F,L
GB-BASIN-2-BACK UP	13-Oct-10	0.16	ND	ND	ND	<3	200	270	870	1140	1300	F,L
GB-BASIN-3-BACK UP	13-Oct-10	0.034	ND	0.07	ND	6	280	390	990	1380	1700	F,L
GB-BASIN-4-BACK UP	13-Oct-10	0.16	ND	ND	ND	<3	420	530	1800	2330	2800	F,L
GB-BASIN-5-BACK UP	13-Oct-10	0.13	ND	ND	ND	<3	390	480	1300	1780	2100	F,L
GB-BASIN-6-BACK UP	13-Oct-10	0.014	ND	ND	ND	<3	25	53	200	253	280	F,L
GB-BASIN-FIELD DUPLICATE-BACK UP	13-Oct-10	0.019	ND	ND	ND	<3	33	86	390	476	500	F,L
GB-CHANNEL-1-BACK UP	13-Oct-10	0.035	ND	ND	ND	<3	30	77	320	397	430	F,L
GB-CHANNEL-2-BACK UP	13-Oct-10	0.039	ND	ND	ND	<3	70	930	1800	2730	2800	F,L
GB-CHANNEL-3-BACK UP	13-Oct-10	0.056	0.05	ND	ND	<3	25	54	180	234	260	F

Atlantic RBCA Tier I Risk-Based Screening Levels[1]											Gasoline (G)	Diesel #2 (F)	#6 Oil (L)
Residential	Potable	Coarse-grained	0.03	0.38	0.08	11					39	140	690
		Fine-grained	0.01	0.08	0.02	2.3					140	220	970
	Non-Potable	Coarse-grained	0.16	14	58	17					39	140	690
		Fine-grained	1.5	120	430	160					330	4400	8300
Commercial	Potable	Coarse-grained	0.03	0.38	0.08	11					450	7400	1000
		Fine-grained	0.01	0.08	0.02	2.3					520	840	4700
	Non-Potable	Coarse-grained	1.8	160	430	200					450	7400	10000
		Fine-grained	11	680	430	650					10000	7400	10000
CCME SQGs for Surface Soils[2]							(C_6-C_{10})	(C_{10}-C_{16})		(C_{16}-C_{34})			
Agricultural		Coarse-grained	0.03[3] (0.0095[4])	0.37	0.082	11	30	150		300			
		Fine-grained	0.0068[3,4]	0.08	0.018	2.4	170	150		1300			
Residential/Parkland		Coarse-grained	0.03[3] (0.0095[4])	0.37	0.082	11	30	150		300			
		Fine-grained	0.0068[3,4]	0.08	0.018	2.4	170	150		1300			
Commercial		Coarse-grained	0.030[3,4]	0.37	0.082	11	240	260		1700			
		Fine-grained	0.0068[3,4]	0.08	0.018	2.4	170	230		2500			
Industrial		Coarse-grained	0.030[3,4]	0.37	0.082	11	240	260		1700			
		Fine-grained	0.0068[3,4]	0.08	0.018	2.4	170	230		2500			

[1]Atlantic RBCA Version 2.0 Reference Document for Petroleum Impacted Sites (2007).

[2]Candian Soil Quality Guidelines for the Protection of Environmental and Human Health, Update 7.0 (Sept 2007)

[3] denotes guideline value based on "10^{-5} Incremental Risk".

[4] denotes guideline value based on "10^{-6} Incremental Risk" (applicable in Ontario and Quebec only)..

[5] denotes Unidentified compound(s) in fuel oil range, unable to confirm the presence of creosote. The sample has chromatographic peaks present that are consistent with peaks observed in creosote reference materials. The source of the peaks cannot be determined based on the chromatographic information.

[6] Fractions (F1, F2, and F3) are now equivalent to the TPH Carbon ranges reported by laboratories using Atlantic RBCA Guidelines for Laboratories Version 3.0 (July 2010).

"-" denotes no guideline available.

"L/D" denotes laboratory duplicate.

"F/D" denotes field duplicate.

"*" Creosote not present

"L" denotes lube oil resemblance

"F" denotes fuel oil resemblance

"NA" denotes not analysed

Table 5 - PCBs, DDT, and TIC/TOC in Soil, Glace Bay Small Craft Harbour, Nova Scotia

Parameter	CCME Soil Quality Guidelines[1]			Units	Sample Concentration												
	Agricultural (mg/kg)	Residential/ Parkland (mg/kg)	Commercial/ Industrial (mg/kg)		GB-BASIN-1-PRIMARY	GB-BASIN-2-PRIMARY	GB-BASIN-3-PRIMARY	GB-BASIN-4-PRIMARY	GB-BASIN-4-PRIMARY LabDup	GB-BASIN-5-PRIMARY	GB-BASIN-5-PRIMARY Lan Dup	GB-BASIN-6-PRIMARY	GB-BASIN-FIELD DUPLICATE-PRIMARY	GB-CHANNEL-1-PRIMARY	GB-CHANNEL-2-PRIMARY	GB-CHANNEL-2-PRIMARY Lab Dup	GB-CHANNEL-3-PRIMARY
PCBs and DDT																	
Total PCB	0.5	1.3	33	mg/kg	0.09	0.22	0.35	0.07	0.06	ND	ND	ND	ND	ND	ND	ND	ND
Carbon																	
Total Inorganic Carbon	-	-	-	g/kg	4	17	ND	13	NA	ND	NA	4	3.9	5.2	5	NA	13
Moisture	-	-	-	%	55	55	46	60	NA	62	NA	35	52	55	69	NA	46
Total Organic Carbon	-	-	-	g/kg	46	45	50	55	NA	68	NA	38	43	45	83	NA	77
Total Carbon - combustion IR	-	-	-	g/kg	50	61	50	67	NA	68	67	43	47	50	88	110	90

'NA' denotes parameter not analysed

[1] denotes Canadian Environmental Quality Guidelines, revised 2007

[2] denotes half of the value of the detection limit was used to calculate total DDT

Left Justified Values indicate CCME Soil Quality Guidelines for Agricultural Application exceedances.

Shaded Values indicate CCME Soil Quality Guidelines for Residential/Parkland Application exceedances.

Interrupted Boxed Values indicate CCME Soil Quality Guidelines for Commercial/Industrial Application exceedances.

Table 6 - Grain Size Analyses in Soil, Glace Bay Small Craft Harbour, Nova Scotia

Parameter	Units	GB-BASIN-1-PRIMARY	GB-BASIN-2-PRIMARY	GB-BASIN-3-PRIMARY	GB-BASIN-4-PRIMARY	GB-BASIN-5-PRIMARY	GB-BASIN-6-PRIMARY	GB-BASIN-FIELD DUPLICATE-PRIMARY	GB-CHANNEL-1-PRIMARY	GB-CHANNEL-2-PRIMARY	GB-CHANNEL-3-PRIMARY
Date Sampled: Sept. 24,2010											
Grain Size Results											
< -4 Phi	%	100	100	100	100	100	100	100	100	100	100
< -3 Phi	%	100	100	100	100	100	100	100	100	100	100
< -2 Phi	%	100	100	100	100	100	100	100	100	100	100
< -1 Phi	%	100	100	86	100	99	96	100	100	99	100
< 0 Phi	%	98	99	84	98	98	94	99	98	96	98
< +1 Phi	%	96	97	82	97	96	93	97	95	92	95
< +2 Phi	%	93	94	78	95	93	90	94	93	88	86
< +3 Phi	%	88	90	65	92	86	83	90	90	83	76
< +4 Phi	%	84	85	47	88	76	61	85	83	77	61
< +5 Phi	%	78	85	43	86	72	46	82	74	68	51
< +6 Phi	%	61	67	34	71	55	33	57	50	50	34
< +7 Phi	%	33	36.0	20	41	32	20	30	24	28	19
< +8 Phi	%	26	28.0	15.0	31	25	17	23	20	24	15
< +9 Phi	%	17.0	17	9	18	15	11	14	13	17	10
Gravel	%	ND	ND	14	0.3	0.7	4.3 (1)	ND	ND	0.7	ND
Sand	%	16	15	39	11	23	35	15	17	23	39
Silt	%	58	57	32	57	51	44	62	64	53	46
Clay	%	26	28.0	15	31	25	17	23	20	24	15

'ND' = Not Detected

(1) Observation Comment: Shells present in fraction.

Table 7
Glace Bay Small Craft Harbour, Nova Scotia
PAH Leachate Comparison to Potable Water & Freshwater Aquatic Life Based Criteria.
Concentrations in ug/L

PAH	CGDWQ	FAL	MAL	RDL	GB-Basin-3-BACK-UP	GB- Basin-5-BACK UP	GB- Channel-1-BACK-UP	GB- Channel-3-BACK-UP	GB- Channel-3-BACK-UP Lab Dup
1-Methylnaphthalene	ng	ng	ng	0.01	0.24	0.37	0.02	0.02	0.03
2-Methylnaphthalene	ng	ng	ng	0.01	0.1	0.34	0.02	0.02	0.02
Acenaphthene	ng	5.8	ng	0.005	0.28	0.13	< 0.005	0.013	0.038
Acenaphthylene	ng	ng	ng	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Anthracene	ng	0.012	ng	0.005	0.078	0.038	0.026	0.014	0.031
Benzo(a)anthracene	0.1	0.018	ng	0.005	0.011	< 0.005	< 0.005	< 0.005	< 0.005
Benzo(a)pyrene	0.01	0.015	ng	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Benzo(b)fluoranthene	0.1	ng	ng	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Benzo(g,h,i)perylene	1	ng	ng	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Benzo(j)fluoranthene	0.1	ng	ng	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Benzo(k)fluoranthene	0.1	ng	ng	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chrysene	1	ng	ng	0.005	0.01	0.007	< 0.005	< 0.005	< 0.005
Dibenz(a,h)anthracene	0.01	ng	ng	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Fluoranthene	ng	0.04	ng	0.005	0.29	0.091	0.032	0.011	0.02
Fluorene	ng	3	ng	0.005	0.17	0.15	0.018	0.017	0.031
Indeno(1,2,3-cd)pyrene	0.1	ng	ng	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Naphthalene	ng	1.1	1.4	0.02	0.19	0.25	0.04	0.1	0.13
Perylene	ng	ng	ng	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Phenanthrene	ng	0.4	ng	0.005	0.37	0.4	0.079	0.048	0.067
Pyrene	ng	0.025	ng	0.005	0.15	0.053	0.017	0.008	0.012

ng - no guideline currently exists
RDL - Reported Detection Limit from laboratory.
<# - not detected above laboratory detection limit of #
Yellow Highlight - exceeds FAL / MAL
Red Highlight - exceeds CGDWQ

Notes:

CGDWQ - Canadian Guideline for Drinking Water Quality values currently exist only for benzo(a)pyrene however the other parameters were taken from the scientific support document for PAHs in soil (CCME, 2010) "Source Guidance Values for Groundwater" Table 7-3, page 135.
FAL - Freshwater Aquatic Life PAH criteria from the Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME 1999).
MAL - Marine Aquatic Life PAH criteria from the Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME 1999).
CCME, 2010. Canadian Soil Quality Guidelines for Carcinogenic and Other Polycyclic Aromatic Hydrocarbons (Environmental and Human Health Effects). Scientific Criteria Document (revised). 216 pp.
CCME, 1999. Canadian water quality guidelines for the protection of aquatic life: Polycyclic aromatic hydrocarbons (PAHs). In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.

Table 8 - Results of BTEX Leachate Analysis, Glace Bay Small Craft Harbour, Nova Scotia

Parameter	CGDWQ MAC	CGDWQ AO	GB-BASIN-2-BACK-UP	GB-BASIN-4-BACK-UP	GB-BASIN-4-BACK-UP Lab Dup	GB-BASIN-5-BACK-UP	GB-CHANNEL-3-BACK-UP
Benzene (ug/L)	5	ng	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene (ug/L)	ng	2.4	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene (ug/L)	ng	2.4	<0.01	<0.01	<0.01	<0.01	<0.01
Xylene (ug/L)	ng	0.003	<0.01	<0.01	<0.01	<0.01	<0.01

CGDWQ - Canadian Guideline for Drinking Water Quality value
MAC - Maximum acceptable concentration
AO - Aesthetic Objectives

Table 9 - SPLP Metals Leachate Analyses - Glace Bay Harbour, Nova Scotia.

PARAMETER	UNIT	RDL	CCME WQGs for the Protection of Aquatic Life		Health Canada CDWQGs		GB-BASIN - 2	GB-BASIN - 3	GB-BASIN - 4+ GB-BASIN - 5[1]	GB-BASIN - 6
			Freshwater	Marine	MAC	AO				
LEACHABLE METALS										
Total Aluminum (Al)	ug/L	5.0	**5**-100 [2]	-	-	-	**135**	**162**	**91.5**	**2490**
Total Antimony (Sb)	ug/L	1.0	-	-	6	-	2.3	1.4	1.1	2.5
Total Arsenic (As)	ug/L	1.0	5	12.5	10	-	2.1	1.8	2.5	**10.8**
Total Barium (Ba)	ug/L	1.0	-	-	100	-	36.9	67.5	41.7	29.1
Total Beryllium (Be)	ug/L	1.0	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0
Total Bismuth (Bi)	ug/L	2.0	-	-	-		< 2.0	< 2.0	< 2.0	< 2.0
Total Boron (B)	ug/L	50	1500	-	5000	-	269	284	321	400
Total Cadmium (Cd)	ug/L	0.017	0.017	0.12	5	-	< 0.017	< 0.017	< 0.017	**0.057**
Total Calcium (Ca)	ug/L	100	-	-	-	-	31000	30700	53500	14200
Total Chromium (Cr)	ug/L	1.0	1	-	50	-	< 1.0	< 1.0	< 1.0	**3.2**
Total Cobalt (Co)	ug/L	0.40	0.4	-	-	-	< 0.4	< 0.4	**0.55**	**1.72**
Total Copper (Cu)	ug/L	2.0	2-4 [3]	-	-	1000	< 2	< 2	< 2	**12.8**
Total Iron (Fe)	ug/L	50	300	-	-	300	< 50	< 50	< 50	**3570**
Total Lead (Pb)	ug/L	0.50	1-7 [4]	-	10	-	< 0.50	< 0.50	< 0.50	**8.80**
Total Magnesium (Mg)	ug/L	100	-	-	-	-	23300	25400	37900	16500
Total Manganese (Mn)	ug/L	2.0	-	-	-	50	15.6	53.4	127	16.3
Total Molybdenum (Mo)	ug/L	2.0	73	-	-	-	**92.5**	58.3	33.3	28.3
Total Nickel (Ni)	ug/L	2.0	25-150 [5]	-	-	-	< 2	< 2	< 2	3.8
Total Potassium (K)	ug/L	100	-	-	-	-	15400	13700	17300	11700
Total Selenium (Se)	ug/L	1.0	1	-	10	-	< 1	< 1	< 1	< 1
Total Silver (Ag)	ug/L	0.10	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1
Total Sodium (Na)	ug/L	100	-	-	-	200000	207000	197000	273000	183000
Total Strontium (Sr)	ug/L	2.0	-	-	-	-	258	342	425	147
Total Thallium (Tl)	ug/L	0.10	0.8	-	-	-	< 2	< 2	< 2	< 2
Total Tin (Sn)	ug/L	2.0	-	-	-	-	< 2	< 2	< 2	< 2
Total Titanium (Ti)	ug/L	2.0	-	-	-	-	2.8	2.0	ND	56.8
Total Uranium (U)	ug/L	0.10	15	-	20	-	0.96	0.66	0.36	2.07
Total Vanadium (V)	ug/L	2.0	-	-	-	-	< 2	< 2	< 2	11.4
Total Zinc (Zn)	ug/L	5.0	30	-	-	5000	< 5	< 5	< 5	20.8

[1] Material from Samples GB-Basin 4 and 5 combined to provinde sufficient sampling media.

[2] Aluminum: 5 ug/L at pH < 6.5; 100 ug/L at ≥ 6.5.

[3] Copper: 2 ug/L at Hardess = 0-60 mg/L; 3ug/L at Hardness = 120-180 mg/L; 4 ug/L at Hardness > 180mg/L.

[4] Lead: 1 ug/L at Hardness 0-60mg/L; 2 ug/L at Hardness = 60-120 mg/L; 4 ug/L at Hardness = 120-180 mg/L; 7 ug/L at Hardness > 180 mg/L.

[5] Nickel: 25 ug/L at Hardness 0-60mg/L; 65 ug/L at Hardness = 60-120 mg/L; 110 ug/L at Hardness = 120-180 mg/L;150 ug/L at Hardness > 180 mg/L..

"MAC" denotes Maximum Acceptable Concentration

"AO" denotes Aestetic objectives

"RDL denotes Reportable Detection Limits

" -" denotes no guideline for the analyte

Bold value indicates exccedance of CCME WQGs for the Protection of Aquatic Life - Freshwater

Italicized value iindicates exceedance of CCME WQGs for the Protection of Aquaitc Life - Marine

Highlighted value indicates exceedance of Health Canada CDWQGs - MAC

Left justified value indicates exceedance of Health Canada CGWQGs - AO

Underlined value indicates exccedance of CCME WQGs for the Protection of Aquatic Life - Freshwater and Marine

Table 10 - TCLP Metals Leachate Analyses - Glace Bay Harbour, Nova Scotia.

PARAMETER	UNIT	NSE Guidelines[1]	GB-BASIN-2	GB-BASIN-3	GB-BASIN-4/ GB-BASIN 5[2]	RDL
LEACHABLE METALS						
Aluminum	mg/L	500	0.0012	0.0022	0.0022	0.100
Antimony	mg/L	-	< 0.02	< 0.02	< 0.02	0.020
Arsenic	mg/L	5	< 0.02	< 0.02	< 0.02	0.020
Barium	mg/L	100*	0.38	0.36	0.3	0.050
Beryllium	mg/L	10	< 0.02	< 0.02	< 0.02	0.020
Boron	mg/L	500*	0.51	< 0.5	0.74	0.500
Cadmium	mg/L	0.5*	< .003	< .003	0.005	0.003
Calcium	mg/L	-	210	100	100	1.000
Chromium	mg/L	5*	< 0.02	< 0.02	< 0.02	0.020
Cobalt	mg/L	5	0.034	0.043	0.034	0.010
Copper	mg/L	100**	< 0.02	< 0.02	< 0.02	0.020
Iron	mg/L	ng	140	120	110	0.500
Lead	mg/L	5*	0.063	0.051	0.087	0.005
Lithium	mg/L	250	0.077	0.079	0.084	0.020
Magnesium	mg/L	ng	65	51	62	1.000
Manganese	mg/L	-	4.3	3.6	2.6	0.020
Molybdenum	mg/L	5	< 0.02	< 0.02	< 0.02	0.020
Nickel	mg/L	20	0.093	0.088	0.086	0.020
Potassium	mg/L	-	20	20	20	1.000
Selenium	mg/L	1*	< 0.01	< 0.01	< 0.01	0.010
Silver	mg/L	5*	< 0.005	< 0.005	< 0.005	0.005
Strontium	mg/L	-	1.3	1.1	1	0.050
Thallium	mg/L	-	< 0.001	< 0.001	< 0.001	0.001
Tin	mg/L	-	< 0.02	< 0.02	< 0.02	0.020
Uranium	mg/L	2*	0.005	0.005	0.004	0.001
Vanadium	mg/L	10	< 0.02	< 0.02	< 0.02	0.020
Zinc	mg/L	500**	1	1.1	1	0.050

" -" denotes no guideline for the analyte

"RDL" denotes Reportable Detection Limit

* Limit from Transportation of Dangerous Goods Regulations

** Limit from CDWQGs

[1] Guidelines for Disposal of Contaminated Solids in Landfills, Nova Scotia Environment (2005)

[2] Material from Samples GB-Basin 4 and 5 combined to provinde sufficient sampling media.

ATTACHMENT B

QA/QC and Laboratory Certificates of Analyses Including Creosote or Coal Tar Resemblances

Your Project #: 10-3343
Site: GLACE BAY
Your C.O.C. #: N/A

Attention: Scott McMillan
Dillon Consulting Limited
Halifax
137 Chain Lake Dr
Suite 100
Halifax , NS
B3S 1B3

Report Date: 2010/11/02

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B0E5261
Received: 2010/10/14, 8:50

Sample Matrix: Soil
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Hexavalent Chromium in Soil by IC (1,2)	10	N/A	2010/10/28	CAM SOP-00436	EPA SW846-3060/7199
TEH in Soil (PIRI)	2	2010/10/18	2010/10/18	ATL SOP 00111 R3	Based on Atl. PIRI
TEH in Soil (PIRI)	5	2010/10/18	2010/10/19	ATL SOP 00111 R3	Based on Atl. PIRI
TEH in Soil (PIRI)	3	2010/10/18	2010/10/20	ATL SOP 00111 R3	Based on Atl. PIRI
Mercury (CVAA)	10	2010/10/15	2010/10/18	ATL SOP 00026 R6	Based on EPA245.5
Metals Solid Avail. Unified MS Low N-per	10	2010/10/19	2010/10/20	ATL SOP 00024 R5	Based on EPA6020A
Moisture	10	N/A	2010/10/15	ATL SOP 00001 R3	MOE Handbook 1983
PAH in sediment by GC/MS (Low Level)	8	2010/10/15	2010/10/23	ATL SOP 00102 R4	based on EPA8270C
PAH in sediment by GC/MS (Low Level)	2	2010/10/15	2010/10/24	ATL SOP 00102 R4	based on EPA8270C
PCB/DDT in Soil by GC-ECD	3	2010/10/25	2010/10/27	ATL SOP 00106 R3	Based EPA8082
PCB/DDT in Soil by GC-ECD	7	2010/10/27	2010/11/02	ATL SOP 00106 R3	Based EPA8082
VPH in Soil - Low Level	4	2010/10/15	2010/10/15	ATL SOP 00119 R6	Based on Atl. PIRI
VPH in Soil - Low Level	6	2010/10/15	2010/10/16	ATL SOP 00119 R6	Based on Atl. PIRI
Particle size in solids (pipette&sieve)	2	N/A	2010/10/22	ATL SOP 00012 R3	based on MSAMS-1978
Particle size in solids (pipette&sieve)	8	N/A	2010/10/25	ATL SOP 00012 R3	based on MSAMS-1978
Total Carbon in Solids by Ind.	9	2010/10/19	2010/10/19	ATL SOP 00044 R3/00045 R4	LECO 203-601-224
Total Carbon in Solids by Ind.	1	2010/10/23	2010/10/23	ATL SOP 00044 R3/00045 R4	LECO 203-601-224
TIC in soil	10	2010/10/14	2010/10/20	ATL SOP 00044 R3/00045 R4	LECO 203-601-224
Total Organic Carbon in Soil	3	2010/10/20	2010/10/19	ATL SOP 00044 R3/00045 R4	LECO 203-601-224
Total Organic Carbon in Soil	6	2010/10/20	2010/10/20	ATL SOP 00044 R3/00045 R4	LECO 203-601-224
Total Organic Carbon in Soil	1	2010/10/22	2010/10/22	ATL SOP 00044 R3/00045 R4	LECO 203-601-224
ModTPH (T1) Calc. for Soil	10	2010/10/14	2010/10/20		Based on Atl. PIRI

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.

../2

Your Project #: 10-3343
Site: GLACE BAY
Your C.O.C. #: N/A

Attention: Scott McMillan
Dillon Consulting Limited
Halifax
137 Chain Lake Dr
Suite 100
Halifax , NS
B3S 1B3

Report Date: 2010/11/02

CERTIFICATE OF ANALYSIS

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

HEATHER MACUMBER, Bedford
Email: HMacumber@maxxam.ca
Phone# (902) 420-0203

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

RESULTS OF ANALYSES OF SOIL

Maxxam ID		HM6396		HM6405		
Sampling Date		2010/10/13 11:10		2010/10/13 11:20		
COC Number		N/A		N/A		
	Units	**GB-BASIN-1-PRIMARY**	**RDL**	**GB-BASIN-2-PRIMARY**	**RDL**	**QC Batch**
Inorganics						
Chromium (VI)	ug/g	ND	0.4	ND	0.2	2309686
Total Inorganic Carbon (C)	g/kg	4	1	17	0.9	2297573
Moisture	%	55	1	55	1	2298232
Organic Carbon (TOC)	g/kg	46	1	45	0.9	2302833
Total Carbon-combustion IR	g/kg	50	0.9	61	0.9	2301835
< -4 Phi (16 mm)	%	100	0.1	100	0.1	2305451
< -3 Phi (8 mm)	%	100	0.1	100	0.1	2305451
< -2 Phi (4 mm)	%	100	0.1	100	0.1	2305451
< -1 Phi (2 mm)	%	100	0.1	100	0.1	2305451
< 0 Phi (1 mm)	%	98	0.1	99	0.1	2305451
< +1 Phi (0.5 mm)	%	96	0.1	97	0.1	2305451
< +2 Phi (0.25 mm)	%	93	0.1	94	0.1	2305451
< +3 Phi (0.12 mm)	%	88	0.1	90	0.1	2305451
< +4 Phi (0.062 mm)	%	84	0.1	85	0.1	2305451
< +5 Phi (0.031 mm)	%	78	0.1	85	0.1	2305451
< +6 Phi (0.016 mm)	%	61	0.1	67	0.1	2305451
< +7 Phi (0.0078 mm)	%	33	0.1	36	0.1	2305451
< +8 Phi (0.0039 mm)	%	26	0.1	28	0.1	2305451
< +9 Phi (0.0020 mm)	%	17	0.1	17	0.1	2305451
Gravel	%	ND	0.1	ND	0.1	2305451
Sand	%	16	0.1	15	0.1	2305451
Silt	%	58	0.1	57	0.1	2305451
Clay	%	26	0.1	28	0.1	2305451

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

RESULTS OF ANALYSES OF SOIL

Maxxam ID		HM6406		HM6407		
Sampling Date		2010/10/13 10:50		2010/10/13 11:35		
COC Number		N/A		N/A		
	Units	**GB-BASIN-3-PRIMARY**	**RDL**	**GB-BASIN-4-PRIMARY**	**RDL**	**QC Batch**
Inorganics						
Chromium (VI)	ug/g	ND	0.2	ND	0.2	2309686
Total Inorganic Carbon (C)	g/kg	ND	1	13	1	2297573
Moisture	%	46	1	60	1	2298232
Organic Carbon (TOC)	g/kg	50	1	55	1	2302833
Total Carbon-combustion IR	g/kg	50	0.7	67	0.9	2301835
< -4 Phi (16 mm)	%	100	0.1	100	0.1	2307424
< -3 Phi (8 mm)	%	100	0.1	100	0.1	2307424
< -2 Phi (4 mm)	%	100	0.1	100	0.1	2307424
< -1 Phi (2 mm)	%	86	0.1	100	0.1	2307424
< 0 Phi (1 mm)	%	84	0.1	98	0.1	2307424
< +1 Phi (0.5 mm)	%	82	0.1	97	0.1	2307424
< +2 Phi (0.25 mm)	%	78	0.1	95	0.1	2307424
< +3 Phi (0.12 mm)	%	65	0.1	92	0.1	2307424
< +4 Phi (0.062 mm)	%	47	0.1	88	0.1	2307424
< +5 Phi (0.031 mm)	%	43	0.1	86	0.1	2307424
< +6 Phi (0.016 mm)	%	34	0.1	71	0.1	2307424
< +7 Phi (0.0078 mm)	%	20	0.1	41	0.1	2307424
< +8 Phi (0.0039 mm)	%	15	0.1	31	0.1	2307424
< +9 Phi (0.0020 mm)	%	9.0	0.1	18	0.1	2307424
Gravel	%	14	0.1	0.3	0.1	2307424
Sand	%	39	0.1	11	0.1	2307424
Silt	%	32	0.1	57	0.1	2307424
Clay	%	15	0.1	31	0.1	2307424

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

RESULTS OF ANALYSES OF SOIL

Maxxam ID		HM6408		HM6408		HM6409		
Sampling Date		2010/10/13 12:05		2010/10/13 12:05		2010/10/13 12:20		
COC Number		N/A		N/A		N/A		
	Units	**GB-BASIN-5-PRIMARY**	**RDL**	**GB-BASIN-5-PRIMARY Lab-Dup**	**RDL**	**GB-BASIN-6-PRIMARY**	**RDL**	**QC Batch**
Inorganics								
Chromium (VI)	ug/g	ND	0.4		0.4	ND	0.4	2309686
Total Inorganic Carbon (C)	g/kg	ND	0.9		0.9	4.0	0.8	2297573
Moisture	%	62	1		1	35	1	2298232
Organic Carbon (TOC)	g/kg	68	0.9		0.9	38	0.8	2302833
Total Carbon-combustion IR	g/kg	68	0.9	67	0.8	43	0.6	2301865
< -4 Phi (16 mm)	%	100	0.1			100	0.1	2307424
< -3 Phi (8 mm)	%	100	0.1			100	0.1	2307424
< -2 Phi (4 mm)	%	100	0.1			100	0.1	2307424
< -1 Phi (2 mm)	%	99	0.1			96	0.1	2307424
< 0 Phi (1 mm)	%	98	0.1			94	0.1	2307424
< +1 Phi (0.5 mm)	%	96	0.1			93	0.1	2307424
< +2 Phi (0.25 mm)	%	93	0.1			90	0.1	2307424
< +3 Phi (0.12 mm)	%	86	0.1			83	0.1	2307424
< +4 Phi (0.062 mm)	%	76	0.1			61	0.1	2307424
< +5 Phi (0.031 mm)	%	72	0.1			46	0.1	2307424
< +6 Phi (0.016 mm)	%	55	0.1			33	0.1	2307424
< +7 Phi (0.0078 mm)	%	32	0.1			20	0.1	2307424
< +8 Phi (0.0039 mm)	%	25	0.1			17	0.1	2307424
< +9 Phi (0.0020 mm)	%	15	0.1			11	0.1	2307424
Gravel	%	0.7	0.1			4.3 (1)	0.1	2307424
Sand	%	23	0.1			35	0.1	2307424
Silt	%	51	0.1			44	0.1	2307424
Clay	%	25	0.1			17	0.1	2307424

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Observation Comment: Shells present in fraction.

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

RESULTS OF ANALYSES OF SOIL

Maxxam ID		HM6410		HM6411		
Sampling Date		2010/10/13 11:10		2010/10/13 12:38		
COC Number		N/A		N/A		
	Units	**GB-BASIN-FIELD DUPLICATE-PRIMARY**	**RDL**	**GB-CHANNEL-1-PRIMARY**	**RDL**	**QC Batch**
Inorganics						
Chromium (VI)	ug/g	ND	0.4	ND	0.4	2309686
Total Inorganic Carbon (C)	g/kg	3.9	0.8	5.2	0.7	2297573
Moisture	%	52	1	55	1	2298232
Organic Carbon (TOC)	g/kg	43	0.6	45	0.6	2302830
Total Carbon-combustion IR	g/kg	47	0.8	50	0.7	2301865
< -4 Phi (16 mm)	%	100	0.1	100	0.1	2307424
< -3 Phi (8 mm)	%	100	0.1	100	0.1	2307424
< -2 Phi (4 mm)	%	100	0.1	100	0.1	2307424
< -1 Phi (2 mm)	%	100	0.1	100	0.1	2307424
< 0 Phi (1 mm)	%	99	0.1	98	0.1	2307424
< +1 Phi (0.5 mm)	%	97	0.1	95	0.1	2307424
< +2 Phi (0.25 mm)	%	94	0.1	93	0.1	2307424
< +3 Phi (0.12 mm)	%	90	0.1	90	0.1	2307424
< +4 Phi (0.062 mm)	%	85	0.1	83	0.1	2307424
< +5 Phi (0.031 mm)	%	82	0.1	74	0.1	2307424
< +6 Phi (0.016 mm)	%	57	0.1	50	0.1	2307424
< +7 Phi (0.0078 mm)	%	30	0.1	24	0.1	2307424
< +8 Phi (0.0039 mm)	%	23	0.1	20	0.1	2307424
< +9 Phi (0.0020 mm)	%	14	0.1	13	0.1	2307424
Gravel	%	ND	0.1	ND	0.1	2307424
Sand	%	15	0.1	17	0.1	2307424
Silt	%	62	0.1	64	0.1	2307424
Clay	%	23	0.1	20	0.1	2307424

ND = Not detected
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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

RESULTS OF ANALYSES OF SOIL

Maxxam ID		HM6412		HM6412		
Sampling Date		2010/10/13 12:45		2010/10/13 12:45		
COC Number		N/A		N/A		
	Units	**GB-CHANNEL-2-PRIMARY**	**RDL**	**GB-CHANNEL-2-PRIMARY Lab-Dup**	**RDL**	**QC Batch**
Inorganics						
Chromium (VI)	ug/g	ND	0.4		0.4	2309686
Total Inorganic Carbon (C)	g/kg	5	1		1	2297573
Moisture	%	69	1		1	2298232
Organic Carbon (TOC)	g/kg	83	1		1	2306362
Total Carbon-combustion IR	g/kg	88	0.9	110	1	2307307
< -4 Phi (16 mm)	%	100	0.1			2307424
< -3 Phi (8 mm)	%	100	0.1			2307424
< -2 Phi (4 mm)	%	100	0.1			2307424
< -1 Phi (2 mm)	%	99	0.1			2307424
< 0 Phi (1 mm)	%	96	0.1			2307424
< +1 Phi (0.5 mm)	%	92	0.1			2307424
< +2 Phi (0.25 mm)	%	88	0.1			2307424
< +3 Phi (0.12 mm)	%	83	0.1			2307424
< +4 Phi (0.062 mm)	%	77	0.1			2307424
< +5 Phi (0.031 mm)	%	68	0.1			2307424
< +6 Phi (0.016 mm)	%	50	0.1			2307424
< +7 Phi (0.0078 mm)	%	28	0.1			2307424
< +8 Phi (0.0039 mm)	%	24	0.1			2307424
< +9 Phi (0.0020 mm)	%	17	0.1			2307424
Gravel	%	0.7	0.1			2307424
Sand	%	23	0.1			2307424
Silt	%	53	0.1			2307424
Clay	%	24	0.1			2307424

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QC Batch = Quality Control Batch

Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

RESULTS OF ANALYSES OF SOIL

Maxxam ID		HM6413		
Sampling Date		2010/10/13 13:10		
COC Number		N/A		
	Units	**GB-CHANNEL-3-PRIMARY**	**RDL**	**QC Batch**
Inorganics				
Chromium (VI)	ug/g	ND	0.4	2309686
Total Inorganic Carbon (C)	g/kg	13	0.8	2297573
Moisture	%	46	1	2298232
Organic Carbon (TOC)	g/kg	77	0.8	2302830
Total Carbon-combustion IR	g/kg	90	0.7	2301865
< -4 Phi (16 mm)	%	100	0.1	2307424
< -3 Phi (8 mm)	%	100	0.1	2307424
< -2 Phi (4 mm)	%	100	0.1	2307424
< -1 Phi (2 mm)	%	100	0.1	2307424
< 0 Phi (1 mm)	%	98	0.1	2307424
< +1 Phi (0.5 mm)	%	95	0.1	2307424
< +2 Phi (0.25 mm)	%	86	0.1	2307424
< +3 Phi (0.12 mm)	%	76	0.1	2307424
< +4 Phi (0.062 mm)	%	61	0.1	2307424
< +5 Phi (0.031 mm)	%	51	0.1	2307424
< +6 Phi (0.016 mm)	%	34	0.1	2307424
< +7 Phi (0.0078 mm)	%	19	0.1	2307424
< +8 Phi (0.0039 mm)	%	15	0.1	2307424
< +9 Phi (0.0020 mm)	%	10	0.1	2307424
Gravel	%	ND	0.1	2307424
Sand	%	39	0.1	2307424
Silt	%	46	0.1	2307424
Clay	%	15	0.1	2307424

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

MERCURY BY COLD VAPOUR AA (SOIL)

Maxxam ID		HM6396	HM6405	HM6406	HM6407		
Sampling Date		2010/10/13 11:10	2010/10/13 11:20	2010/10/13 10:50	2010/10/13 11:35		
COC Number		N/A	N/A	N/A	N/A		
	Units	**GB-BASIN-1-PRIMARY**	**GB-BASIN-2-PRIMARY**	**GB-BASIN-3-PRIMARY**	**GB-BASIN-4-PRIMARY**	**RDL**	**QC Batch**
Metals							
Mercury (Hg)	mg/kg	0.05	0.13	0.30	0.29	0.01	2300192

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		HM6408	HM6409		HM6410		
Sampling Date		2010/10/13 12:05	2010/10/13 12:20		2010/10/13 11:10		
COC Number		N/A	N/A		N/A		
	Units	**GB-BASIN-5-PRIMARY**	**GB-BASIN-6-PRIMARY**	**QC Batch**	**GB-BASIN-FIELD DUPLICATE-PRIMARY**	**RDL**	**QC Batch**
Metals							
Mercury (Hg)	mg/kg	0.67	0.13	2300192	0.04	0.01	2300196

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		HM6410	HM6411	HM6412		
Sampling Date		2010/10/13 11:10	2010/10/13 12:38	2010/10/13 12:45		
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-FIELD DUPLICATE-PRIMARY Lab-Dup**	**GB-CHANNEL-1-PRIMARY**	**GB-CHANNEL-2-PRIMARY**	**RDL**	**QC Batch**
Metals						
Mercury (Hg)	mg/kg	0.05	0.03	0.02	0.01	2300196

N/A = Not Applicable
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QC Batch = Quality Control Batch

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

MERCURY BY COLD VAPOUR AA (SOIL)

Maxxam ID		HM6413		
Sampling Date		2010/10/13 13:10		
COC Number		N/A		
	Units	**GB-CHANNEL-3-PRIMARY**	**RDL**	**QC Batch**
Metals				
Mercury (Hg)	mg/kg	0.02	0.01	2300196

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

PCB'S AND DDT BY GC-ECD (SOIL)

Maxxam ID		HM6396	HM6405	HM6406		
Sampling Date		2010/10/13 11:10	2010/10/13 11:20	2010/10/13 10:50		
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-1-PRIMARY**	**GB-BASIN-2-PRIMARY**	**GB-BASIN-3-PRIMARY**	**RDL**	**QC Batch**
PCBs						
Total PCB	mg/kg	0.09	0.22	0.35	0.01	2307810
Surrogate Recovery (%)						
Decachlorobiphenyl	%	85 (1)	86 (1)	86 (1)		2307810

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Aroclor 1254.

Maxxam ID		HM6407	HM6407	HM6408		
Sampling Date		2010/10/13 11:35	2010/10/13 11:35	2010/10/13 12:05		
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-4-PRIMARY**	**GB-BASIN-4-PRIMARY Lab-Dup**	**GB-BASIN-5-PRIMARY**	**RDL**	**QC Batch**
PCBs						
Total PCB	mg/kg	0.07	0.06	ND	0.01	2310237
Surrogate Recovery (%)						
Decachlorobiphenyl	%	82 (1)	82	91		2310237

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Aroclor 1260.

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

PCB'S AND DDT BY GC-ECD (SOIL)

Maxxam ID		HM6409	HM6410	HM6411		
Sampling Date		2010/10/13 12:20	2010/10/13 11:10	2010/10/13 12:38		
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-6-PRIMARY**	**GB-BASIN-FIELD DUPLICATE-PRIMARY**	**GB-CHANNEL-1-PRIMARY**	**RDL**	**QC Batch**
PCBs						
Total PCB	mg/kg	ND	ND	ND	0.01	2310237
Surrogate Recovery (%)						
Decachlorobiphenyl	%	79	91	78		2310237

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		HM6412	HM6413		
Sampling Date		2010/10/13 12:45	2010/10/13 13:10		
COC Number		N/A	N/A		
	Units	**GB-CHANNEL-2-PRIMARY**	**GB-CHANNEL-3-PRIMARY**	**RDL**	**QC Batch**
PCBs					
Total PCB	mg/kg	ND	ND	0.01	2310237
Surrogate Recovery (%)					
Decachlorobiphenyl	%	94	80		2310237

ND = Not detected
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RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		HM6396	HM6405		HM6406		
Sampling Date		2010/10/13 11:10	2010/10/13 11:20		2010/10/13 10:50		
COC Number		N/A	N/A		N/A		
	Units	**GB-BASIN-1-PRIMARY**	**GB-BASIN-2-PRIMARY**	**RDL**	**GB-BASIN-3-PRIMARY**	**RDL**	**QC Batch**
Metals							
Available Aluminum (Al)	mg/kg	12000	13000	10	9800	10	2302625
Available Antimony (Sb)	mg/kg	ND	ND	2	ND	2	2302625
Available Arsenic (As)	mg/kg	10	11	2	16	2	2302625
Available Barium (Ba)	mg/kg	99	120	5	100	5	2302625
Available Beryllium (Be)	mg/kg	ND	ND	2	ND	2	2302625
Available Bismuth (Bi)	mg/kg	ND	ND	2	ND	2	2302625
Available Boron (B)	mg/kg	30	30	5	18	5	2302625
Available Cadmium (Cd)	mg/kg	0.8	0.9	0.3	0.8	0.3	2302625
Available Chromium (Cr)	mg/kg	26	27	2	21	2	2302625
Available Cobalt (Co)	mg/kg	15	15	1	14	1	2302625
Available Copper (Cu)	mg/kg	56	89	2	130	2	2302625
Available Iron (Fe)	mg/kg	31000	36000	50	30000	50	2302625
Available Lead (Pb)	mg/kg	38	70	0.5	76	0.5	2302625
Available Lithium (Li)	mg/kg	25	29	2	24	2	2302625
Available Manganese (Mn)	mg/kg	580	570	2	390	2	2302625
Available Mercury (Hg)	mg/kg	0.3	0.2	0.1	0.2	0.1	2302625
Available Molybdenum (Mo)	mg/kg	5	6	2	7	2	2302625
Available Nickel (Ni)	mg/kg	33	34	2	27	2	2302625
Available Rubidium (Rb)	mg/kg	12	13	2	8	2	2302625
Available Selenium (Se)	mg/kg	ND (1)	ND (1)	2	2	1	2302625
Available Silver (Ag)	mg/kg	0.5	1.3	0.5	4.0	0.5	2302625
Available Strontium (Sr)	mg/kg	55	63	5	46	5	2302625
Available Thallium (Tl)	mg/kg	0.5	0.4	0.1	0.3	0.1	2302625
Available Tin (Sn)	mg/kg	5	8	2	11	2	2302625
Available Uranium (U)	mg/kg	1.3	1.4	0.1	1.5	0.1	2302625
Available Vanadium (V)	mg/kg	38	36	2	27	2	2302625
Available Zinc (Zn)	mg/kg	140	180	5	220	5	2302625

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(1) Elevated reporting limit due to sample matrix.

Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		HM6407	HM6408		HM6409		
Sampling Date		2010/10/13 11:35	2010/10/13 12:05		2010/10/13 12:20		
COC Number		N/A	N/A		N/A		
	Units	**GB-BASIN-4-PRIMARY**	**GB-BASIN-5-PRIMARY**	**RDL**	**GB-BASIN-6-PRIMARY**	**RDL**	**QC Batch**
Metals							
Available Aluminum (Al)	mg/kg	13000	12000	10	9400	10	2302625
Available Antimony (Sb)	mg/kg	ND	ND	2	ND	2	2302625
Available Arsenic (As)	mg/kg	13	19	2	14	2	2302625
Available Barium (Ba)	mg/kg	140	120	5	60	5	2302625
Available Beryllium (Be)	mg/kg	ND	ND	2	ND	2	2302625
Available Bismuth (Bi)	mg/kg	ND	ND	2	ND	2	2302625
Available Boron (B)	mg/kg	29	35	5	17	5	2302625
Available Cadmium (Cd)	mg/kg	1.3	1.0	0.3	ND	0.3	2302625
Available Chromium (Cr)	mg/kg	27	28	2	23	2	2302625
Available Cobalt (Co)	mg/kg	15	14	1	19	1	2302625
Available Copper (Cu)	mg/kg	220	200	2	36	2	2302625
Available Iron (Fe)	mg/kg	36000	37000	50	34000	50	2302625
Available Lead (Pb)	mg/kg	110	130	0.5	49	0.5	2302625
Available Lithium (Li)	mg/kg	27	27	2	25	2	2302625
Available Manganese (Mn)	mg/kg	500	470	2	300	2	2302625
Available Mercury (Hg)	mg/kg	0.5	0.6	0.1	0.2	0.1	2302625
Available Molybdenum (Mo)	mg/kg	9	6	2	4	2	2302625
Available Nickel (Ni)	mg/kg	34	31	2	31	2	2302625
Available Rubidium (Rb)	mg/kg	12	11	2	9	2	2302625
Available Selenium (Se)	mg/kg	ND (1)	ND (1)	5	1	1	2302625
Available Silver (Ag)	mg/kg	3.6	2.1	0.5	ND	0.5	2302625
Available Strontium (Sr)	mg/kg	73	60	5	26	5	2302625
Available Thallium (Tl)	mg/kg	0.5	0.3	0.1	0.2	0.1	2302625
Available Tin (Sn)	mg/kg	15	13	2	7	2	2302625
Available Uranium (U)	mg/kg	1.5	1.4	0.1	1.0	0.1	2302625
Available Vanadium (V)	mg/kg	34	39	2	25	2	2302625
Available Zinc (Zn)	mg/kg	250	240	5	120	5	2302625

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(1) Elevated reporting limit due to sample matrix.

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		HM6410	HM6411	HM6412		
Sampling Date		2010/10/13 11:10	2010/10/13 12:38	2010/10/13 12:45		
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-FIELD DUPLICATE-PRIMARY**	**GB-CHANNEL-1-PRIMARY**	**GB-CHANNEL-2-PRIMARY**	**RDL**	**QC Batch**
Metals						
Available Aluminum (Al)	mg/kg	13000	11000	9200	10	2302625
Available Antimony (Sb)	mg/kg	ND	ND	ND	2	2302625
Available Arsenic (As)	mg/kg	10	10	10	2	2302625
Available Barium (Ba)	mg/kg	99	99	82	5	2302625
Available Beryllium (Be)	mg/kg	ND	ND	ND	2	2302625
Available Bismuth (Bi)	mg/kg	ND	ND	ND	2	2302625
Available Boron (B)	mg/kg	31	32	40	5	2302625
Available Cadmium (Cd)	mg/kg	0.9	0.9	0.9	0.3	2302625
Available Chromium (Cr)	mg/kg	29	25	22	2	2302625
Available Cobalt (Co)	mg/kg	17	14	12	1	2302625
Available Copper (Cu)	mg/kg	64	50	41	2	2302625
Available Iron (Fe)	mg/kg	34000	31000	29000	50	2302625
Available Lead (Pb)	mg/kg	42	31	23	0.5	2302625
Available Lithium (Li)	mg/kg	30	24	20	2	2302625
Available Manganese (Mn)	mg/kg	620	590	590	2	2302625
Available Mercury (Hg)	mg/kg	0.1	0.1	0.1	0.1	2302625
Available Molybdenum (Mo)	mg/kg	8	4	5	2	2302625
Available Nickel (Ni)	mg/kg	37	30	29	2	2302625
Available Rubidium (Rb)	mg/kg	13	13	11	2	2302625
Available Selenium (Se)	mg/kg	ND (1)	ND (1)	ND (1)	5	2302625
Available Silver (Ag)	mg/kg	0.5	ND	ND	0.5	2302625
Available Strontium (Sr)	mg/kg	59	48	100	5	2302625
Available Thallium (Tl)	mg/kg	0.4	0.3	0.3	0.1	2302625
Available Tin (Sn)	mg/kg	4	3	3	2	2302625
Available Uranium (U)	mg/kg	1.8	1.1	1.2	0.1	2302625
Available Vanadium (V)	mg/kg	42	35	32	2	2302625
Available Zinc (Zn)	mg/kg	160	140	110	5	2302625

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(1) Elevated reporting limit due to sample matrix.

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Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		HM6413	HM6413		
Sampling Date		2010/10/13 13:10	2010/10/13 13:10		
COC Number		N/A	N/A		
	Units	**GB-CHANNEL-3-PRIMARY**	**GB-CHANNEL-3-PRIMARY Lab-Dup**	**RDL**	**QC Batch**
Metals					
Available Aluminum (Al)	mg/kg	8400	8800	10	2302625
Available Antimony (Sb)	mg/kg	ND	ND	2	2302625
Available Arsenic (As)	mg/kg	8	8	2	2302625
Available Barium (Ba)	mg/kg	66	68	5	2302625
Available Beryllium (Be)	mg/kg	ND	ND	2	2302625
Available Bismuth (Bi)	mg/kg	ND	ND	2	2302625
Available Boron (B)	mg/kg	24	30	5	2302625
Available Cadmium (Cd)	mg/kg	0.5	0.6	0.3	2302625
Available Chromium (Cr)	mg/kg	19	18	2	2302625
Available Cobalt (Co)	mg/kg	12	11	1	2302625
Available Copper (Cu)	mg/kg	33	32	2	2302625
Available Iron (Fe)	mg/kg	26000	28000	50	2302625
Available Lead (Pb)	mg/kg	19	19	0.5	2302625
Available Lithium (Li)	mg/kg	19	18	2	2302625
Available Manganese (Mn)	mg/kg	560	590	2	2302625
Available Mercury (Hg)	mg/kg	0.1	0.1	0.1	2302625
Available Molybdenum (Mo)	mg/kg	6	6	2	2302625
Available Nickel (Ni)	mg/kg	26	24	2	2302625
Available Rubidium (Rb)	mg/kg	10	10	2	2302625
Available Selenium (Se)	mg/kg	ND (1)	ND (1)	2	2302625
Available Silver (Ag)	mg/kg	ND	ND	0.5	2302625
Available Strontium (Sr)	mg/kg	51	50	5	2302625
Available Thallium (Tl)	mg/kg	0.3	0.3	0.1	2302625
Available Tin (Sn)	mg/kg	3	3	2	2302625
Available Uranium (U)	mg/kg	1.3	1.3	0.1	2302625
Available Vanadium (V)	mg/kg	27	25	2	2302625
Available Zinc (Zn)	mg/kg	85	87	5	2302625

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N/A = Not Applicable
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QC Batch = Quality Control Batch
(1) Elevated reporting limit due to sample matrix.

Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		HM6396	HM6405	HM6406		
Sampling Date		2010/10/13 11:10	2010/10/13 11:20	2010/10/13 10:50		
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-1-PRIMARY**	**GB-BASIN-2-PRIMARY**	**GB-BASIN-3-PRIMARY**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons						
1-Methylnaphthalene	mg/kg	0.11	0.25	0.17	0.005	2299041
2-Methylnaphthalene	mg/kg	0.12	0.32	0.23	0.005	2299041
Acenaphthene	mg/kg	0.036	0.082	0.21	0.005	2299041
Acenaphthylene	mg/kg	ND	ND	ND	0.005	2299041
Anthracene	mg/kg	0.23	0.17	0.17	0.005	2299041
Benzo(a)anthracene	mg/kg	0.20	0.33	0.42	0.005	2299041
Benzo(a)pyrene	mg/kg	0.17	0.28	0.25	0.005	2299041
Benzo(b)fluoranthene	mg/kg	0.19	0.28	0.36	0.005	2299041
Benzo(g,h,i)perylene	mg/kg	0.11	0.18	0.17	0.005	2299041
Benzo(j)fluoranthene	mg/kg	0.14	0.21	0.22	0.005	2299041
Benzo(k)fluoranthene	mg/kg	0.15	0.18	0.22	0.005	2299041
Chrysene	mg/kg	0.25	0.40	0.36	0.005	2299041
Dibenz(a,h)anthracene	mg/kg	0.027	0.047	0.032	0.005	2299041
Fluoranthene	mg/kg	0.64	1.0	2.0	0.005	2299041
Fluorene	mg/kg	0.057	0.14	0.23	0.005	2299041
Indeno(1,2,3-cd)pyrene	mg/kg	0.094	0.15	0.15	0.005	2299041
Naphthalene	mg/kg	0.12	0.22	0.13	0.005	2299041
Perylene	mg/kg	0.042	0.096	0.21	0.005	2299041
Phenanthrene	mg/kg	0.49	1.0	0.97	0.005	2299041
Pyrene	mg/kg	0.50	0.77	1.4	0.005	2299041
Surrogate Recovery (%)						
D10-Anthracene	%	90	76	82		2299041
D14-Terphenyl	%	72	74	72		2299041
D8-Acenaphthylene	%	73	78	75		2299041

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		HM6407	HM6408	HM6409		
Sampling Date		2010/10/13 11:35	2010/10/13 12:05	2010/10/13 12:20		
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-4-PRIMARY**	**GB-BASIN-5-PRIMARY**	**GB-BASIN-6-PRIMARY**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons						
1-Methylnaphthalene	mg/kg	0.24	0.20	0.059	0.005	2299041
2-Methylnaphthalene	mg/kg	0.35	0.27	0.058	0.005	2299041
Acenaphthene	mg/kg	0.16	0.12	0.14	0.005	2299041
Acenaphthylene	mg/kg	ND	ND	0.010	0.005	2299041
Anthracene	mg/kg	0.16	0.26	0.31	0.005	2299041
Benzo(a)anthracene	mg/kg	0.52	0.59	0.36	0.005	2299041
Benzo(a)pyrene	mg/kg	0.35	0.42	0.26	0.005	2299041
Benzo(b)fluoranthene	mg/kg	0.48	0.47	0.25	0.005	2299041
Benzo(g,h,i)perylene	mg/kg	0.28	0.29	0.15	0.005	2299041
Benzo(j)fluoranthene	mg/kg	0.33	0.32	0.18	0.005	2299041
Benzo(k)fluoranthene	mg/kg	0.25	0.25	0.16	0.005	2299041
Chrysene	mg/kg	0.59	0.59	0.32	0.005	2299041
Dibenz(a,h)anthracene	mg/kg	0.081	0.035	0.045	0.005	2299041
Fluoranthene	mg/kg	1.6	1.6	1.4	0.005	2299041
Fluorene	mg/kg	0.22	0.18	0.13	0.005	2299041
Indeno(1,2,3-cd)pyrene	mg/kg	0.24	0.29	0.15	0.005	2299041
Naphthalene	mg/kg	0.21	0.16	0.086	0.005	2299041
Perylene	mg/kg	0.29	0.18	0.26	0.005	2299041
Phenanthrene	mg/kg	1.4	1.2	0.58	0.005	2299041
Pyrene	mg/kg	1.2	1.3	1.2	0.005	2299041
Surrogate Recovery (%)						
D10-Anthracene	%	75	72	71		2299041
D14-Terphenyl	%	73	71	74		2299041
D8-Acenaphthylene	%	74	70	72		2299041

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		HM6409	HM6410	HM6411		
Sampling Date		2010/10/13 12:20	2010/10/13 11:10	2010/10/13 12:38		
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-6-PRIMARY Lab-Dup**	**GB-BASIN-FIELD DUPLICATE-PRIMARY**	**GB-CHANNEL-1-PRIMARY**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons						
1-Methylnaphthalene	mg/kg	0.056	0.087	0.082	0.005	2299041
2-Methylnaphthalene	mg/kg	0.063	0.096	0.10	0.005	2299041
Acenaphthene	mg/kg	0.18	0.043	0.024	0.005	2299041
Acenaphthylene	mg/kg	0.015	ND	ND	0.005	2299041
Anthracene	mg/kg	0.31	0.18	0.083	0.005	2299041
Benzo(a)anthracene	mg/kg	0.45	0.24	0.20	0.005	2299041
Benzo(a)pyrene	mg/kg	0.30	0.21	0.19	0.005	2299041
Benzo(b)fluoranthene	mg/kg	0.19	0.21	0.18	0.005	2299041
Benzo(g,h,i)perylene	mg/kg	0.17	0.14	0.11	0.005	2299041
Benzo(j)fluoranthene	mg/kg	0.19	0.16	0.15	0.005	2299041
Benzo(k)fluoranthene	mg/kg	0.15	0.14	0.13	0.005	2299041
Chrysene	mg/kg	0.41	0.25	0.23	0.005	2299041
Dibenz(a,h)anthracene	mg/kg	0.052	0.037	0.028	0.005	2299041
Fluoranthene	mg/kg	2.2	0.66	0.47	0.005	2299041
Fluorene	mg/kg	0.18	0.066	0.036	0.005	2299041
Indeno(1,2,3-cd)pyrene	mg/kg	0.17	0.12	0.12	0.005	2299041
Naphthalene	mg/kg	0.11	0.092	0.089	0.005	2299041
Perylene	mg/kg	0.25	0.056	0.052	0.005	2299041
Phenanthrene	mg/kg	0.68	0.54	0.33	0.005	2299041
Pyrene	mg/kg	2.1 (1)	0.52	0.34	0.005	2299041
Surrogate Recovery (%)						
D10-Anthracene	%	73	73	93		2299041
D14-Terphenyl	%	76	73	70		2299041
D8-Acenaphthylene	%	72	71	73		2299041

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Duplicate: < 10 % of compounds in multi-component analysis in violation.

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		HM6412	HM6413		
Sampling Date		2010/10/13 12:45	2010/10/13 13:10		
COC Number		N/A	N/A		
	Units	**GB-CHANNEL-2-PRIMARY**	**GB-CHANNEL-3-PRIMARY**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons					
1-Methylnaphthalene	mg/kg	0.090	0.12	0.005	2299041
2-Methylnaphthalene	mg/kg	0.083	0.13	0.005	2299041
Acenaphthene	mg/kg	0.045	0.067	0.005	2299041
Acenaphthylene	mg/kg	ND	ND	0.005	2299041
Anthracene	mg/kg	0.17	0.29	0.005	2299041
Benzo(a)anthracene	mg/kg	0.13	0.16	0.005	2299041
Benzo(a)pyrene	mg/kg	0.081	0.13	0.005	2299041
Benzo(b)fluoranthene	mg/kg	0.071	0.095	0.005	2299041
Benzo(g,h,i)perylene	mg/kg	0.059	0.062	0.005	2299041
Benzo(j)fluoranthene	mg/kg	0.076	0.092	0.005	2299041
Benzo(k)fluoranthene	mg/kg	0.059	0.076	0.005	2299041
Chrysene	mg/kg	0.16	0.19	0.005	2299041
Dibenz(a,h)anthracene	mg/kg	ND	ND	0.005	2299041
Fluoranthene	mg/kg	0.39	0.58	0.005	2299041
Fluorene	mg/kg	0.059	0.092	0.005	2299041
Indeno(1,2,3-cd)pyrene	mg/kg	0.054	0.062	0.005	2299041
Naphthalene	mg/kg	0.12	0.15	0.005	2299041
Perylene	mg/kg	ND	0.023	0.005	2299041
Phenanthrene	mg/kg	0.42	0.68	0.005	2299041
Pyrene	mg/kg	0.30	0.43	0.005	2299041
Surrogate Recovery (%)					
D10-Anthracene	%	83	82		2299041
D14-Terphenyl	%	71	72		2299041
D8-Acenaphthylene	%	72	73		2299041

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		HM6396	HM6405	HM6406		
Sampling Date		2010/10/13 11:10	2010/10/13 11:20	2010/10/13 10:50		
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-1-PRIMARY**	**GB-BASIN-2-PRIMARY**	**GB-BASIN-3-PRIMARY**	**RDL**	**QC Batch**
Petroleum Hydrocarbons						
Benzene	mg/kg	0.019	0.20	0.021	0.003	2298880
Toluene	mg/kg	ND	ND	ND	0.03	2298880
Ethylbenzene	mg/kg	ND	ND	0.06	0.01	2298880
Xylene (Total)	mg/kg	ND	0.17	0.09	0.05	2298880
C6 - C10 (less BTEX)	mg/kg	ND	ND	6	3	2298880
>C10-C16 Hydrocarbons	mg/kg	39	200	280	10	2300093
>C16-C21 Hydrocarbons	mg/kg	100	270	390	10	2300093
>C21-<C32 Hydrocarbons	mg/kg	410	870	990	15	2300093
Modified TPH (Tier1)	mg/kg	550	1300	1700	20	2296713
Reached Baseline at C32	mg/kg	No	No	No	N/A	2300093
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (2)	COMMENT (2)	N/A	2300093
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	89	82	92		2300093
n-Dotriacontane - Extractable	%	81	79	90		2300093
Isobutylbenzene - Volatile	%	95	97	97		2298880

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) One product in fuel / lube range. Lube oil fraction.
(2) Weathered fuel oil fraction. Lube oil fraction. Unidentified compound(s) in lube oil range.

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		HM6407	HM6407		HM6408		
Sampling Date		2010/10/13 11:35	2010/10/13 11:35		2010/10/13 12:05		
COC Number		N/A	N/A		N/A		
	Units	**GB-BASIN-4-PRIMARY**	**GB-BASIN-4-PRIMARY Lab-Dup**	**QC Batch**	**GB-BASIN-5-PRIMARY**	**RDL**	**QC Batch**
Petroleum Hydrocarbons							
Benzene	mg/kg	0.11	0.14	2298880	0.10	0.003	2298880
Toluene	mg/kg	ND	ND	2298880	ND	0.03	2298880
Ethylbenzene	mg/kg	ND	0.04	2298880	ND	0.01	2298880
Xylene (Total)	mg/kg	ND	ND	2298880	ND	0.05	2298880
C6 - C10 (less BTEX)	mg/kg	ND	ND	2298880	ND	3	2298880
>C10-C16 Hydrocarbons	mg/kg	420		2300093	390	10	2300096
>C16-C21 Hydrocarbons	mg/kg	530		2300093	480	10	2300096
>C21-<C32 Hydrocarbons	mg/kg	1800		2300093	1300	15	2300096
Modified TPH (Tier1)	mg/kg	2800		2296713	2100	20	2296713
Reached Baseline at C32	mg/kg	No		2300093	No	N/A	2300096
Hydrocarbon Resemblance	mg/kg	COMMENT (1)		2300093	COMMENT (2)	N/A	2300096
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	92		2300093	92		2300096
n-Dotriacontane - Extractable	%	94		2300093	114		2300096
Isobutylbenzene - Volatile	%	76	83	2298880	77		2298880

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Weathered fuel oil fraction. Lube oil fraction. Unidentified compound(s) in lube oil range.
(2) Weathered fuel oil fraction. Possible lube oil fraction. Unidentified compound(s) in lube oil range.

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		HM6408		HM6409		
Sampling Date		2010/10/13 12:05		2010/10/13 12:20		
COC Number		N/A		N/A		
	Units	**GB-BASIN-5-PRIMARY Lab-Dup**	**QC Batch**	**GB-BASIN-6-PRIMARY**	**RDL**	**QC Batch**
Petroleum Hydrocarbons						
Benzene	mg/kg		2298880	ND	0.003	2298880
Toluene	mg/kg		2298880	ND	0.03	2298880
Ethylbenzene	mg/kg		2298880	ND	0.01	2298880
Xylene (Total)	mg/kg		2298880	ND	0.05	2298880
C6 - C10 (less BTEX)	mg/kg		2298880	ND	3	2298880
>C10-C16 Hydrocarbons	mg/kg	530	2300096	25	10	2300093
>C16-C21 Hydrocarbons	mg/kg	640	2300096	53	10	2300093
>C21-<C32 Hydrocarbons	mg/kg	1700	2300096	200	15	2300093
Modified TPH (Tier1)	mg/kg		2296713	280	20	2296713
Reached Baseline at C32	mg/kg		2300096	No	N/A	2300093
Hydrocarbon Resemblance	mg/kg		2300096	COMMENT (1)	N/A	2300093
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	90	2300096	86		2300093
n-Dotriacontane - Extractable	%	120	2300096	87		2300093
Isobutylbenzene - Volatile	%		2298880	103		2298880

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) One product in fuel / lube range. Lube oil fraction.

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		HM6410	HM6411		
Sampling Date		2010/10/13 11:10	2010/10/13 12:38		
COC Number		N/A	N/A		
	Units	**GB-BASIN-FIELD DUPLICATE-PRIMARY**	**GB-CHANNEL-1-PRIMARY**	**RDL**	**QC Batch**
Petroleum Hydrocarbons					
Benzene	mg/kg	0.012	ND	0.003	2298880
Toluene	mg/kg	ND	ND	0.03	2298880
Ethylbenzene	mg/kg	ND	ND	0.01	2298880
Xylene (Total)	mg/kg	ND	ND	0.05	2298880
C6 - C10 (less BTEX)	mg/kg	ND	ND	3	2298880
>C10-C16 Hydrocarbons	mg/kg	33	30	10	2300093
>C16-C21 Hydrocarbons	mg/kg	86	77	10	2300093
>C21-<C32 Hydrocarbons	mg/kg	390	320	15	2300093
Modified TPH (Tier1)	mg/kg	500	430	20	2296713
Reached Baseline at C32	mg/kg	No	No	N/A	2300093
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (1)	N/A	2300093
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	86	82		2300093
n-Dotriacontane - Extractable	%	86	79		2300093
Isobutylbenzene - Volatile	%	99	108		2298880

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) One product in fuel / lube range. Lube oil fraction.

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		HM6412		HM6413		
Sampling Date		2010/10/13 12:45		2010/10/13 13:10		
COC Number		N/A		N/A		
	Units	**GB-CHANNEL-2-PRIMARY**	**QC Batch**	**GB-CHANNEL-3-PRIMARY**	**RDL**	**QC Batch**
Petroleum Hydrocarbons						
Benzene	mg/kg	ND	2298880	0.048	0.003	2298880
Toluene	mg/kg	ND	2298880	ND	0.03	2298880
Ethylbenzene	mg/kg	ND	2298880	ND	0.01	2298880
Xylene (Total)	mg/kg	ND	2298880	ND	0.05	2298880
C6 - C10 (less BTEX)	mg/kg	ND	2298880	ND	3	2298880
>C10-C16 Hydrocarbons	mg/kg	70	2300093	25	10	2300096
>C16-C21 Hydrocarbons	mg/kg	930	2300093	54	10	2300096
>C21-<C32 Hydrocarbons	mg/kg	1800	2300093	180	15	2300096
Modified TPH (Tier1)	mg/kg	2800	2297574	260	20	2297574
Reached Baseline at C32	mg/kg	No	2300093	No	N/A	2300096
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	2300093	COMMENT (2)	N/A	2300096
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	86	2300093	98		2300096
n-Dotriacontane - Extractable	%	81	2300093	130		2300096
Isobutylbenzene - Volatile	%	96	2298880	106		2298880

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) One product in fuel / lube range. Unidentified compound(s) in fuel / lube range.
(2) One product in fuel / lube range. Possible lube oil fraction. Unidentified compound(s) in lube oil range.

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Maxxam Job #: B0E5261
Report Date: 2010/11/02

Dillon Consulting Limited
Client Project #: 10-3343
Project name: GLACE BAY

GENERAL COMMENTS

TEH Analysis: Samples HM6396, HM6405-13: No creosote present.

Hexavalent chromium: Due to the sample matrix, some samples required dilution. Detection limits were adjusted accordingly.

Partial report previously sent.

Results relate only to the items tested.

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Dillon Consulting Limited
Attention: Scott McMillan
Client Project #: 10-3343
P.O. #:
Project name: GLACE BAY

Quality Assurance Report

Maxxam Job Number: DB0E5261

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2298880	ASL	Matrix Spike						
		[HM6407-01]	Isobutylbenzene - Volatile	2010/10/15		54 (1)	%	60 - 140
			Benzene	2010/10/15		64	%	60 - 140
			Toluene	2010/10/15		90	%	60 - 140
			Ethylbenzene	2010/10/15		71	%	60 - 140
			Xylene (Total)	2010/10/15		82	%	60 - 140
		Spiked Blank	Isobutylbenzene - Volatile	2010/10/15		103	%	60 - 140
			Benzene	2010/10/15		98	%	60 - 140
			Toluene	2010/10/15		100	%	60 - 140
			Ethylbenzene	2010/10/15		99	%	60 - 140
			Xylene (Total)	2010/10/15		100	%	60 - 140
		Method Blank	Isobutylbenzene - Volatile	2010/10/15		100	%	60 - 140
			Benzene	2010/10/15	ND, RDL=0.003		mg/kg	
			Toluene	2010/10/15	ND, RDL=0.03		mg/kg	
			Ethylbenzene	2010/10/15	ND, RDL=0.01		mg/kg	
			Xylene (Total)	2010/10/15	ND, RDL=0.05		mg/kg	
			C6 - C10 (less BTEX)	2010/10/15	ND, RDL=3		mg/kg	
		RPD [HM6407-01]	Benzene	2010/10/15	17.6		%	50
			Toluene	2010/10/15	NC		%	50
			Ethylbenzene	2010/10/15	NC		%	50
			Xylene (Total)	2010/10/15	NC		%	50
			C6 - C10 (less BTEX)	2010/10/15	NC		%	50
2299041	DCF	Matrix Spike						
		[HM6409-01]	D10-Anthracene	2010/10/23		72	%	30 - 130
			D14-Terphenyl	2010/10/23		75	%	30 - 130
			D8-Acenaphthylene	2010/10/23		71	%	30 - 130
			1-Methylnaphthalene	2010/10/23		79	%	30 - 130
			2-Methylnaphthalene	2010/10/23		75	%	30 - 130
			Acenaphthene	2010/10/23		NC	%	30 - 130
			Acenaphthylene	2010/10/23		79	%	30 - 130
			Anthracene	2010/10/23		NC	%	30 - 130
			Benzo(a)anthracene	2010/10/23		NC	%	30 - 130
			Benzo(a)pyrene	2010/10/23		NC	%	30 - 130
			Benzo(b)fluoranthene	2010/10/23		NC	%	30 - 130
			Benzo(g,h,i)perylene	2010/10/23		NC	%	30 - 130
			Benzo(j)fluoranthene	2010/10/23		NC	%	30 - 130
			Benzo(k)fluoranthene	2010/10/23		NC	%	30 - 130
			Chrysene	2010/10/23		NC	%	30 - 130
			Dibenz(a,h)anthracene	2010/10/23		88	%	30 - 130
			Fluoranthene	2010/10/23		NC	%	30 - 130
			Fluorene	2010/10/23		NC	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2010/10/23		NC	%	30 - 130
			Naphthalene	2010/10/23		NC	%	30 - 130
			Perylene	2010/10/23		NC	%	30 - 130
			Phenanthrene	2010/10/23		NC	%	30 - 130
			Pyrene	2010/10/23		NC	%	30 - 130
		Spiked Blank	D10-Anthracene	2010/10/20		82	%	30 - 130
			D14-Terphenyl	2010/10/20		80	%	30 - 130
			D8-Acenaphthylene	2010/10/20		71	%	30 - 130
			1-Methylnaphthalene	2010/10/20		71	%	30 - 130
			2-Methylnaphthalene	2010/10/20		69	%	30 - 130
			Acenaphthene	2010/10/20		82	%	30 - 130
			Acenaphthylene	2010/10/20		74	%	30 - 130
			Anthracene	2010/10/20		100	%	30 - 130
			Benzo(a)anthracene	2010/10/20		85	%	30 - 130

This document is in electronic format, hard copy is available on request.

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Dillon Consulting Limited
Attention: Scott McMillan
Client Project #: 10-3343
P.O. #:
Project name: GLACE BAY

Quality Assurance Report (Continued)

Maxxam Job Number: DB0E5261

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2299041	DCF	Spiked Blank	Benzo(a)pyrene	2010/10/20		104	%	30 - 130
			Benzo(b)fluoranthene	2010/10/20		87	%	30 - 130
			Benzo(g,h,i)perylene	2010/10/20		106	%	30 - 130
			Benzo(j)fluoranthene	2010/10/20		104	%	30 - 130
			Benzo(k)fluoranthene	2010/10/20		104	%	30 - 130
			Chrysene	2010/10/20		98	%	30 - 130
			Dibenz(a,h)anthracene	2010/10/20		90	%	30 - 130
			Fluoranthene	2010/10/20		96	%	30 - 130
			Fluorene	2010/10/20		83	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2010/10/20		98	%	30 - 130
			Naphthalene	2010/10/20		78	%	30 - 130
			Perylene	2010/10/20		102	%	30 - 130
			Phenanthrene	2010/10/20		89	%	30 - 130
			Pyrene	2010/10/20		100	%	30 - 130
		Method Blank	D10-Anthracene	2010/10/20		75	%	30 - 130
			D14-Terphenyl	2010/10/20		80	%	30 - 130
			D8-Acenaphthylene	2010/10/20		71	%	30 - 130
			1-Methylnaphthalene	2010/10/20	ND, RDL=0.005		mg/kg	
			2-Methylnaphthalene	2010/10/20	ND, RDL=0.005		mg/kg	
			Acenaphthene	2010/10/20	ND, RDL=0.005		mg/kg	
			Acenaphthylene	2010/10/20	ND, RDL=0.005		mg/kg	
			Anthracene	2010/10/20	ND, RDL=0.005		mg/kg	
			Benzo(a)anthracene	2010/10/20	ND, RDL=0.005		mg/kg	
			Benzo(a)pyrene	2010/10/20	ND, RDL=0.005		mg/kg	
			Benzo(b)fluoranthene	2010/10/20	ND, RDL=0.005		mg/kg	
			Benzo(g,h,i)perylene	2010/10/20	ND, RDL=0.005		mg/kg	
			Benzo(j)fluoranthene	2010/10/20	ND, RDL=0.005		mg/kg	
			Benzo(k)fluoranthene	2010/10/20	ND, RDL=0.005		mg/kg	
			Chrysene	2010/10/20	ND, RDL=0.005		mg/kg	
			Dibenz(a,h)anthracene	2010/10/20	ND, RDL=0.005		mg/kg	
			Fluoranthene	2010/10/20	ND, RDL=0.005		mg/kg	
			Fluorene	2010/10/20	ND, RDL=0.005		mg/kg	
			Indeno(1,2,3-cd)pyrene	2010/10/20	ND, RDL=0.005		mg/kg	
			Naphthalene	2010/10/20	ND, RDL=0.005		mg/kg	
			Perylene	2010/10/20	ND, RDL=0.005		mg/kg	
			Phenanthrene	2010/10/20	ND, RDL=0.005		mg/kg	
			Pyrene	2010/10/20	ND, RDL=0.005		mg/kg	
		RPD [HM6409-01]	1-Methylnaphthalene	2010/10/23	4.8		%	50
			2-Methylnaphthalene	2010/10/23	9.0		%	50
			Acenaphthene	2010/10/23	27.6		%	50
			Acenaphthylene	2010/10/23	NC		%	50
			Anthracene	2010/10/23	0.8		%	50
			Benzo(a)anthracene	2010/10/23	23.5		%	50
			Benzo(a)pyrene	2010/10/23	12.6		%	50
			Benzo(b)fluoranthene	2010/10/23	23.0		%	50
			Benzo(g,h,i)perylene	2010/10/23	11.0		%	50
			Benzo(j)fluoranthene	2010/10/23	3.5		%	50
			Benzo(k)fluoranthene	2010/10/23	5.9		%	50
			Chrysene	2010/10/23	24.8		%	50
			Dibenz(a,h)anthracene	2010/10/23	14.8		%	50
			Fluoranthene	2010/10/23	44.4		%	50
			Fluorene	2010/10/23	33.2		%	50
			Indeno(1,2,3-cd)pyrene	2010/10/23	14.2		%	50
			Naphthalene	2010/10/23	26.8		%	50
			Perylene	2010/10/23	4.7		%	50

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Project name: GLACE BAY

Quality Assurance Report (Continued)

Maxxam Job Number: DB0E5261

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2299041	DCF	RPD [HM6409-01]	Phenanthrene	2010/10/23	15.3		%	50
			Pyrene	2010/10/23	53.5 (2)		%	50
2300093	SHR	Matrix Spike	Isobutylbenzene - Extractable	2010/10/18		89	%	30 - 130
			n-Dotriacontane - Extractable	2010/10/18		90	%	30 - 130
			>C10-C16 Hydrocarbons	2010/10/18		87	%	30 - 130
			>C16-C21 Hydrocarbons	2010/10/18		85	%	30 - 130
			>C21-<C32 Hydrocarbons	2010/10/18		105	%	30 - 130
		Spiked Blank	Isobutylbenzene - Extractable	2010/10/18		86	%	30 - 130
			n-Dotriacontane - Extractable	2010/10/18		85	%	30 - 130
			>C10-C16 Hydrocarbons	2010/10/18		84	%	30 - 130
			>C16-C21 Hydrocarbons	2010/10/18		81	%	30 - 130
			>C21-<C32 Hydrocarbons	2010/10/18		108	%	30 - 130
		Method Blank	Isobutylbenzene - Extractable	2010/10/18		88	%	30 - 130
			n-Dotriacontane - Extractable	2010/10/18		89	%	30 - 130
			>C10-C16 Hydrocarbons	2010/10/18	ND, RDL=10		mg/kg	
			>C16-C21 Hydrocarbons	2010/10/18	ND, RDL=10		mg/kg	
			>C21-<C32 Hydrocarbons	2010/10/18	ND, RDL=15		mg/kg	
		RPD	>C10-C16 Hydrocarbons	2010/10/18	NC		%	50
			>C16-C21 Hydrocarbons	2010/10/18	NC		%	50
			>C21-<C32 Hydrocarbons	2010/10/18	0.8		%	50
2300096	LMU	Matrix Spike [HM6408-01]	Isobutylbenzene - Extractable	2010/10/18		93	%	30 - 130
			n-Dotriacontane - Extractable	2010/10/18		135 (3)	%	30 - 130
			>C10-C16 Hydrocarbons	2010/10/18		NC	%	30 - 130
			>C16-C21 Hydrocarbons	2010/10/18		NC	%	30 - 130
			>C21-<C32 Hydrocarbons	2010/10/18		NC	%	30 - 130
		Spiked Blank	Isobutylbenzene - Extractable	2010/10/18		96	%	30 - 130
			n-Dotriacontane - Extractable	2010/10/18		113	%	30 - 130
			>C10-C16 Hydrocarbons	2010/10/18		98	%	30 - 130
			>C16-C21 Hydrocarbons	2010/10/18		95	%	30 - 130
			>C21-<C32 Hydrocarbons	2010/10/18		101	%	30 - 130
		Method Blank	Isobutylbenzene - Extractable	2010/10/18		96	%	30 - 130
			n-Dotriacontane - Extractable	2010/10/18		111	%	30 - 130
			>C10-C16 Hydrocarbons	2010/10/18	ND, RDL=10		mg/kg	
			>C16-C21 Hydrocarbons	2010/10/18	ND, RDL=10		mg/kg	
			>C21-<C32 Hydrocarbons	2010/10/18	ND, RDL=15		mg/kg	
		RPD [HM6408-01]	>C10-C16 Hydrocarbons	2010/10/18	31.5		%	50
			>C16-C21 Hydrocarbons	2010/10/18	29.0		%	50
			>C21-<C32 Hydrocarbons	2010/10/18	28.5		%	50
2300192	JRC	Matrix Spike	Mercury (Hg)	2010/10/18		NC	%	75 - 125
		QC Standard	Mercury (Hg)	2010/10/18		107	%	N/A
		Spiked Blank	Mercury (Hg)	2010/10/18		84	%	N/A
		Method Blank	Mercury (Hg)	2010/10/18	ND, RDL=0.01		mg/kg	
		RPD	Mercury (Hg)	2010/10/18	8.5		%	35
2300196	JRC	Matrix Spike [HM6410-01]	Mercury (Hg)	2010/10/18		NC	%	75 - 125
		QC Standard	Mercury (Hg)	2010/10/18		94	%	N/A
		Spiked Blank	Mercury (Hg)	2010/10/18		92	%	N/A
		Method Blank	Mercury (Hg)	2010/10/18	ND, RDL=0.01		mg/kg	
		RPD [HM6410-01]	Mercury (Hg)	2010/10/18	NC		%	35
2301835	JPU	QC Standard	Total Carbon-combustion IR	2010/10/19		99	%	75 - 125
		Method Blank	Total Carbon-combustion IR	2010/10/19	ND, RDL=0.2		g/kg	
		RPD	Total Carbon-combustion IR	2010/10/19	NC		%	35
2301865	JPU	QC Standard	Total Carbon-combustion IR	2010/10/19		99	%	75 - 125
		Method Blank	Total Carbon-combustion IR	2010/10/19	ND, RDL=0.2		g/kg	

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Project name: GLACE BAY

Quality Assurance Report (Continued)

Maxxam Job Number: DB0E5261

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2301865	JPU	RPD [HM6408-01]	Total Carbon-combustion IR	2010/10/19	1.0		%	35
2302625	KGU	Matrix Spike [HM6413-01]	Available Aluminum (Al)	2010/10/20		NC	%	75 - 125
			Available Antimony (Sb)	2010/10/20		89	%	75 - 125
			Available Arsenic (As)	2010/10/20		110	%	75 - 125
			Available Barium (Ba)	2010/10/20		NC	%	75 - 125
			Available Beryllium (Be)	2010/10/20		98	%	75 - 125
			Available Bismuth (Bi)	2010/10/20		97	%	75 - 125
			Available Boron (B)	2010/10/20		NC	%	75 - 125
			Available Cadmium (Cd)	2010/10/20		105	%	75 - 125
			Available Chromium (Cr)	2010/10/20		NC	%	75 - 125
			Available Cobalt (Co)	2010/10/20		NC	%	75 - 125
			Available Copper (Cu)	2010/10/20		NC	%	75 - 125
			Available Iron (Fe)	2010/10/20		NC	%	75 - 125
			Available Lead (Pb)	2010/10/20		NC	%	75 - 125
			Available Lithium (Li)	2010/10/20		NC	%	75 - 125
			Available Manganese (Mn)	2010/10/20		NC	%	75 - 125
			Available Mercury (Hg)	2010/10/20		99	%	75 - 125
			Available Molybdenum (Mo)	2010/10/20		108	%	75 - 125
			Available Nickel (Ni)	2010/10/20		NC	%	75 - 125
			Available Rubidium (Rb)	2010/10/20		99	%	75 - 125
			Available Selenium (Se)	2010/10/20		96	%	75 - 125
			Available Silver (Ag)	2010/10/20		97	%	75 - 125
			Available Strontium (Sr)	2010/10/20		NC	%	75 - 125
			Available Thallium (Tl)	2010/10/20		94	%	75 - 125
			Available Tin (Sn)	2010/10/20		111	%	75 - 125
			Available Uranium (U)	2010/10/20		105	%	75 - 125
			Available Vanadium (V)	2010/10/20		NC	%	75 - 125
			Available Zinc (Zn)	2010/10/20		101	%	75 - 125
		QC Standard	Available Aluminum (Al)	2010/10/20		74 (4)	%	75 - 125
			Available Arsenic (As)	2010/10/20		112	%	75 - 125
			Available Barium (Ba)	2010/10/20		106	%	75 - 125
			Available Chromium (Cr)	2010/10/20		81	%	75 - 125
			Available Cobalt (Co)	2010/10/20		101	%	75 - 125
			Available Copper (Cu)	2010/10/20		96	%	75 - 125
			Available Iron (Fe)	2010/10/20		88	%	75 - 125
			Available Lead (Pb)	2010/10/20		97	%	75 - 125
			Available Manganese (Mn)	2010/10/20		101	%	75 - 125
			Available Nickel (Ni)	2010/10/20		105	%	75 - 125
			Available Strontium (Sr)	2010/10/20		88	%	75 - 125
			Available Vanadium (V)	2010/10/20		106	%	75 - 125
			Available Zinc (Zn)	2010/10/20		106	%	75 - 125
		Spiked Blank	Available Aluminum (Al)	2010/10/20		94	%	75 - 125
			Available Antimony (Sb)	2010/10/20		104	%	75 - 125
			Available Arsenic (As)	2010/10/20		92	%	75 - 125
			Available Barium (Ba)	2010/10/20		98	%	75 - 125
			Available Beryllium (Be)	2010/10/20		86	%	75 - 125
			Available Bismuth (Bi)	2010/10/20		95	%	75 - 125
			Available Boron (B)	2010/10/20		79	%	75 - 125
			Available Cadmium (Cd)	2010/10/20		104	%	75 - 125
			Available Chromium (Cr)	2010/10/20		92	%	75 - 125
			Available Cobalt (Co)	2010/10/20		99	%	75 - 125
			Available Copper (Cu)	2010/10/20		89	%	75 - 125
			Available Iron (Fe)	2010/10/20		90	%	75 - 125
			Available Lead (Pb)	2010/10/20		92	%	75 - 125

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Dillon Consulting Limited
Attention: Scott McMillan
Client Project #: 10-3343
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Project name: GLACE BAY

Quality Assurance Report (Continued)

Maxxam Job Number: DB0E5261

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2302625	KGU	Spiked Blank	Available Lithium (Li)	2010/10/20		89	%	75 - 125
			Available Manganese (Mn)	2010/10/20		98	%	75 - 125
			Available Mercury (Hg)	2010/10/20		97	%	75 - 125
			Available Molybdenum (Mo)	2010/10/20		100	%	75 - 125
			Available Nickel (Ni)	2010/10/20		95	%	75 - 125
			Available Rubidium (Rb)	2010/10/20		110	%	75 - 125
			Available Selenium (Se)	2010/10/20		98	%	75 - 125
			Available Silver (Ag)	2010/10/20		99	%	75 - 125
			Available Strontium (Sr)	2010/10/20		98	%	75 - 125
			Available Thallium (Tl)	2010/10/20		87	%	75 - 125
			Available Tin (Sn)	2010/10/20		108	%	75 - 125
			Available Uranium (U)	2010/10/20		97	%	75 - 125
			Available Vanadium (V)	2010/10/20		96	%	75 - 125
			Available Zinc (Zn)	2010/10/20		98	%	75 - 125
		Method Blank	Available Aluminum (Al)	2010/10/20	ND, RDL=10		mg/kg	
			Available Antimony (Sb)	2010/10/20	ND, RDL=2		mg/kg	
			Available Arsenic (As)	2010/10/20	ND, RDL=2 (5)		mg/kg	
			Available Barium (Ba)	2010/10/20	ND, RDL=5		mg/kg	
			Available Beryllium (Be)	2010/10/20	ND, RDL=2		mg/kg	
			Available Bismuth (Bi)	2010/10/20	ND, RDL=2		mg/kg	
			Available Boron (B)	2010/10/20	ND, RDL=5		mg/kg	
			Available Cadmium (Cd)	2010/10/20	ND, RDL=0.3		mg/kg	
			Available Chromium (Cr)	2010/10/20	ND, RDL=2		mg/kg	
			Available Cobalt (Co)	2010/10/20	ND, RDL=1		mg/kg	
			Available Copper (Cu)	2010/10/20	ND, RDL=2		mg/kg	
			Available Iron (Fe)	2010/10/20	ND, RDL=50		mg/kg	
			Available Lead (Pb)	2010/10/20	ND, RDL=0.5		mg/kg	
			Available Lithium (Li)	2010/10/20	ND, RDL=2		mg/kg	
			Available Manganese (Mn)	2010/10/20	ND, RDL=2		mg/kg	
			Available Mercury (Hg)	2010/10/20	ND, RDL=0.1		mg/kg	
			Available Molybdenum (Mo)	2010/10/20	ND, RDL=2		mg/kg	
			Available Nickel (Ni)	2010/10/20	ND, RDL=2		mg/kg	
			Available Rubidium (Rb)	2010/10/20	ND, RDL=2		mg/kg	
			Available Selenium (Se)	2010/10/20	ND, RDL=1		mg/kg	
			Available Silver (Ag)	2010/10/20	ND, RDL=0.5		mg/kg	
			Available Strontium (Sr)	2010/10/20	ND, RDL=5		mg/kg	
			Available Thallium (Tl)	2010/10/20	ND, RDL=0.1		mg/kg	
			Available Tin (Sn)	2010/10/20	ND, RDL=2		mg/kg	
			Available Uranium (U)	2010/10/20	ND, RDL=0.1		mg/kg	
			Available Vanadium (V)	2010/10/20	ND, RDL=2		mg/kg	
			Available Zinc (Zn)	2010/10/20	ND, RDL=5		mg/kg	
		RPD [HM6413-01]	Available Aluminum (Al)	2010/10/20	4.6		%	35
			Available Antimony (Sb)	2010/10/20	NC		%	35
			Available Arsenic (As)	2010/10/20	NC		%	35
			Available Barium (Ba)	2010/10/20	3.7		%	35
			Available Beryllium (Be)	2010/10/20	NC		%	35
			Available Bismuth (Bi)	2010/10/20	NC		%	35
			Available Boron (B)	2010/10/20	NC		%	35
			Available Cadmium (Cd)	2010/10/20	NC		%	35
			Available Chromium (Cr)	2010/10/20	2.2		%	35
			Available Cobalt (Co)	2010/10/20	6.2		%	35
			Available Copper (Cu)	2010/10/20	1.9		%	35
			Available Iron (Fe)	2010/10/20	4.4		%	35
			Available Lead (Pb)	2010/10/20	1.9		%	35
			Available Lithium (Li)	2010/10/20	1.8		%	35

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Quality Assurance Report (Continued)

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QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2302625	KGU	RPD [HM6413-01]	Available Manganese (Mn)	2010/10/20	5.8		%	35
			Available Mercury (Hg)	2010/10/20	NC		%	35
			Available Molybdenum (Mo)	2010/10/20	NC		%	35
			Available Nickel (Ni)	2010/10/20	6.1		%	35
			Available Rubidium (Rb)	2010/10/20	NC		%	35
			Available Selenium (Se)	2010/10/20	NC (6)		%	35
			Available Silver (Ag)	2010/10/20	NC		%	35
			Available Strontium (Sr)	2010/10/20	1.8		%	35
			Available Thallium (Tl)	2010/10/20	NC		%	35
			Available Tin (Sn)	2010/10/20	NC		%	35
			Available Uranium (U)	2010/10/20	4.3		%	35
			Available Vanadium (V)	2010/10/20	8.9		%	35
			Available Zinc (Zn)	2010/10/20	2.2		%	35
2302830	JPU	QC Standard	Organic Carbon (TOC)	2010/10/19		97	%	75 - 125
		Method Blank	Organic Carbon (TOC)	2010/10/19	ND, RDL=0.2		g/kg	
		RPD	Organic Carbon (TOC)	2010/10/19	0.3		%	35
2302833	JPU	QC Standard	Organic Carbon (TOC)	2010/10/20		97	%	75 - 125
		Method Blank	Organic Carbon (TOC)	2010/10/20	ND, RDL=0.2		g/kg	
		RPD	Organic Carbon (TOC)	2010/10/20	2.3		%	35
2305451	BAN	RPD	< -4 Phi (16 mm)	2010/10/22	0		%	25
			< -3 Phi (8 mm)	2010/10/22	0		%	25
			< -2 Phi (4 mm)	2010/10/22	0		%	25
			< -1 Phi (2 mm)	2010/10/22	1		%	25
			< 0 Phi (1 mm)	2010/10/22	0.2		%	25
			< +1 Phi (0.5 mm)	2010/10/22	5.7		%	25
			< +2 Phi (0.25 mm)	2010/10/22	0		%	25
			< +3 Phi (0.12 mm)	2010/10/22	3.4		%	25
			< +4 Phi (0.062 mm)	2010/10/22	7.2		%	25
			< +5 Phi (0.031 mm)	2010/10/22	2.9		%	25
			< +6 Phi (0.016 mm)	2010/10/22	NC		%	25
			< +7 Phi (0.0078 mm)	2010/10/22	NC		%	25
			< +8 Phi (0.0039 mm)	2010/10/22	NC		%	25
			< +9 Phi (0.0020 mm)	2010/10/22	NC		%	25
			Gravel	2010/10/22	18.4		%	25
			Sand	2010/10/22	0.9		%	25
			Silt	2010/10/22	NC		%	25
			Clay	2010/10/22	NC		%	25
2306362	JPU	QC Standard	Organic Carbon (TOC)	2010/10/22		98	%	75 - 125
		Method Blank	Organic Carbon (TOC)	2010/10/22	ND, RDL=0.2		g/kg	
		RPD	Organic Carbon (TOC)	2010/10/22	NC		%	35
2307307	JPU	QC Standard	Total Carbon-combustion IR	2010/10/23		100	%	75 - 125
		Method Blank	Total Carbon-combustion IR	2010/10/23	ND, RDL=0.2		g/kg	
		RPD [HM6412-01]	Total Carbon-combustion IR	2010/10/23	18.9		%	35
2307810	RST	Matrix Spike	Decachlorobiphenyl	2010/10/27		106	%	70 - 130
			Total PCB	2010/10/27		100	%	70 - 130
		Spiked Blank	Decachlorobiphenyl	2010/10/27		109	%	70 - 130
			Total PCB	2010/10/27		96	%	70 - 130
		Method Blank	Decachlorobiphenyl	2010/10/27		99	%	70 - 130
			Total PCB	2010/10/27	ND, RDL=0.01		mg/kg	
		RPD	Total PCB	2010/10/27	NC		%	50
2309686	SAC	Matrix Spike	Chromium (VI)	2010/10/28		81	%	75 - 125
		QC Standard	Chromium (VI)	2010/10/28		98	%	75 - 125
		Spiked Blank	Chromium (VI)	2010/10/28		100	%	80 - 120
		Method Blank	Chromium (VI)	2010/10/28	ND, RDL=0.2		ug/g	
		RPD	Chromium (VI)	2010/10/28	NC		%	25

This document is in electronic format, hard copy is available on request.

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Dillon Consulting Limited
Attention: Scott McMillan
Client Project #: 10-3343
P.O. #:
Project name: GLACE BAY

Quality Assurance Report (Continued)

Maxxam Job Number: DB0E5261

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2310237	RST	Matrix Spike						
		[HM6407-01]	Decachlorobiphenyl	2010/11/02		88	%	70 - 130
			Total PCB	2010/11/02		92	%	70 - 130
		Spiked Blank	Decachlorobiphenyl	2010/11/02		97	%	70 - 130
			Total PCB	2010/11/02		96	%	70 - 130
		Method Blank	Decachlorobiphenyl	2010/11/02		76	%	70 - 130
			Total PCB	2010/11/02	ND, RDL=0.01		mg/kg	
		RPD [HM6407-01]	Total PCB	2010/11/02	10.5		%	50

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) VPH surrogate not within acceptance limits. Analysis was repeated with similar results.
(2) Duplicate: < 10 % of compounds in multi-component analysis in violation.
(3) TEH Surrogate(s): results are within acceptance limits.
(4) Low recovery due to digestion efficiency.
(5) A chloride interference over correction is suspected. Results may be biased low by 1 RDL (2mg/kg) for work sheet # 2302625.
(6) Elevated reporting limit due to sample matrix.

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Site: GLACE BAY
Your C.O.C. #: N/A

Attention: Scott McMillan
Dillon Consulting Limited
Halifax
137 Chain Lake Dr
Suite 100
Halifax , NS
B3S 1B3

Report Date: 2011/01/06

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B0I1355
Received: 2010/12/16, 10:26

Sample Matrix: Soil
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI)	10	2010/12/16	2010/12/17	ATL SOP 00111 R3	Based on Atl. PIRI
Moisture	10	N/A	2010/12/16	ATL SOP 00001 R3	MOE Handbook 1983
PAH in Water by GC/MS (IACR evaluation)	4	2010/12/22	2010/12/24	ATL SOP 00103 R3	Based on EPA 8270C
VPH in Leachates (PIRI)	4	2010/12/22	2010/12/23	ATL SOP 00118 R4	Based on Atl. PIRI
VPH in Soil - Low Level	10	2010/12/16	2010/12/16	ATL SOP 00119 R6	Based on Atl. PIRI
SPLP Inorganic extraction - pH	4	N/A	2010/12/22	ATL SOP 00036 R4	Based on EPA1312
SPLP Inorganic extraction - Weight	4	N/A	2010/12/22	ATL SOP 00036 R4	Based on EPA1312
Total Oil and Grease - Soil (1)	10	2010/12/22	2011/01/05	ATL SOP 00100 R3	Based on EPA9071B
ModTPH (T1) Calc. for Soil	10	2010/12/16	2010/12/20		Based on Atl. PIRI

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) MENV

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

HEATHER MACUMBER, Bedford
Email: HMacumber@maxxam.ca
Phone# (902) 420-0203

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

RESULTS OF ANALYSES OF SOIL

Maxxam ID		IE3376	IE3381		
Sampling Date		2010/10/13 11:10	2010/10/13 11:20		
COC Number		N/A	N/A		
	Units	**GB-BASIN-1-BACK-UP P#HM6821**	**GB-BASIN-2-BACK-UP P#HM6827**	**RDL**	**QC Batch**
Inorganics					
Moisture	%	53	47	1	2360834
Petroleum Hydrocarbons					
Total Oil & Grease	mg/kg	4900	9300	100	2366550

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		IE3382	IE3383		
Sampling Date		2010/10/13 10:50	2010/10/13 11:35		
COC Number		N/A	N/A		
	Units	**GB-BASIN-3-BACK-UP P#HM6828**	**GB-BASIN-4-BACK-UP P#HM6829**	**RDL**	**QC Batch**
Charge/Prep Analysis					
Sample Weight (as received)	g	50		N/A	2366254
Final pH	N/A	8.51		N/A	2366255
Inorganics					
Moisture	%	52	58	1	2360834
Petroleum Hydrocarbons					
Total Oil & Grease	mg/kg	9500	8700	100	2366550

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

RESULTS OF ANALYSES OF SOIL

Maxxam ID		IE3384	IE3385		
Sampling Date		2010/10/13 12:05	2010/10/13 12:20		
COC Number		N/A	N/A		
	Units	**GB-BASIN-5-BACK-UP P#HM6830**	**GB-BASIN-6-BACK-UP P#HM6831**	**RDL**	**QC Batch**
Charge/Prep Analysis					
Sample Weight (as received)	g	50		N/A	2366254
Final pH	N/A	8.25		N/A	2366255
Inorganics					
Moisture	%	62	46	1	2360834
Petroleum Hydrocarbons					
Total Oil & Grease	mg/kg	20000	2600	100	2366550

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		IE3386	IE3387		
Sampling Date		2010/10/13 11:10	2010/10/13 12:38		
COC Number		N/A	N/A		
	Units	**GB-BASIN-FIELD DUPLICATE-BACK-UP P#HM6832**	**GB-CHANNEL-1-BACK-UP P#HM6833**	**RDL**	**QC Batch**
Charge/Prep Analysis					
Sample Weight (as received)	g		50	N/A	2366254
Final pH	N/A		8.27	N/A	2366255
Inorganics					
Moisture	%	50	60	1	2360834
Petroleum Hydrocarbons					
Total Oil & Grease	mg/kg	3400	5600	100	2366550

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

RESULTS OF ANALYSES OF SOIL

Maxxam ID		IE3388	IE3389		
Sampling Date		2010/10/13 12:45	2010/10/13 13:10		
COC Number		N/A	N/A		
	Units	**GB-CHANNEL-2-BACK-UP P#HM6834**	**GB-CHANNEL-3-BACK-UP P#HM6835**	**RDL**	**QC Batch**
Charge/Prep Analysis					
Sample Weight (as received)	g		50	N/A	2366254
Final pH	N/A		8.41	N/A	2366255
Inorganics					
Moisture	%	64	34	1	2360834
Petroleum Hydrocarbons					
Total Oil & Grease	mg/kg	5800	2000	100	2366550

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		IE3389		
Sampling Date		2010/10/13 13:10		
COC Number		N/A		
	Units	**GB-CHANNEL-3-BACK-UP P#HM6835 Lab-Dup**	**RDL**	**QC Batch**
Charge/Prep Analysis				
Sample Weight (as received)	g	50	N/A	2366254
Final pH	N/A	8.37	N/A	2366255

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		IE3382	IE3384		
Sampling Date		2010/10/13 10:50	2010/10/13 12:05		
COC Number		N/A	N/A		
	Units	**GB-BASIN-3-BACK-UP P#HM6828**	**GB-BASIN-5-BACK-UP P#HM6830**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons					
1-Methylnaphthalene	ug/L	0.24	0.37	0.01	2366495
2-Methylnaphthalene	ug/L	0.10	0.34	0.01	2366495
Acenaphthene	ug/L	0.28	0.13	0.005	2366495
Acenaphthylene	ug/L	ND	ND	0.005	2366495
Anthracene	ug/L	0.078	0.083	0.005	2366495
Benzo(a)anthracene	ug/L	0.011	ND	0.005	2366495
Benzo(a)pyrene	ug/L	ND	ND	0.005	2366495
Benzo(b)fluoranthene	ug/L	ND	ND	0.005	2366495
Benzo(g,h,i)perylene	ug/L	ND	ND	0.005	2366495
Benzo(j)fluoranthene	ug/L	ND	ND	0.005	2366495
Benzo(k)fluoranthene	ug/L	ND	ND	0.005	2366495
Chrysene	ug/L	0.010	0.007	0.005	2366495
Dibenz(a,h)anthracene	ug/L	ND	ND	0.005	2366495
Fluoranthene	ug/L	0.29	0.091	0.005	2366495
Fluorene	ug/L	0.17	0.15	0.005	2366495
Indeno(1,2,3-cd)pyrene	ug/L	ND	ND	0.005	2366495
Naphthalene	ug/L	0.19	0.25	0.02	2366495
Perylene	ug/L	ND	ND	0.005	2366495
Phenanthrene	ug/L	0.37	0.40	0.005	2366495
Pyrene	ug/L	0.15	0.053	0.005	2366495
Surrogate Recovery (%)					
D10-Anthracene	%	95	73		2366495
D14-Terphenyl	%	120	99		2366495
D8-Acenaphthylene	%	128	118		2366495

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		IE3387	IE3389		
Sampling Date		2010/10/13 12:38	2010/10/13 13:10		
COC Number		N/A	N/A		
	Units	**GB-CHANNEL-1-BACK-UP P#HM6833**	**GB-CHANNEL-3-BACK-UP P#HM6835**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons					
1-Methylnaphthalene	ug/L	0.02	0.02	0.01	2366495
2-Methylnaphthalene	ug/L	0.02	0.02	0.01	2366495
Acenaphthene	ug/L	ND	0.013	0.005	2366495
Acenaphthylene	ug/L	ND	ND	0.005	2366495
Anthracene	ug/L	0.026	0.014	0.005	2366495
Benzo(a)anthracene	ug/L	ND	ND	0.005	2366495
Benzo(a)pyrene	ug/L	ND	ND	0.005	2366495
Benzo(b)fluoranthene	ug/L	ND	ND	0.005	2366495
Benzo(g,h,i)perylene	ug/L	ND	ND	0.005	2366495
Benzo(j)fluoranthene	ug/L	ND	ND	0.005	2366495
Benzo(k)fluoranthene	ug/L	ND	ND	0.005	2366495
Chrysene	ug/L	ND	ND	0.005	2366495
Dibenz(a,h)anthracene	ug/L	ND	ND	0.005	2366495
Fluoranthene	ug/L	0.032	0.011	0.005	2366495
Fluorene	ug/L	0.018	0.017	0.005	2366495
Indeno(1,2,3-cd)pyrene	ug/L	ND	ND	0.005	2366495
Naphthalene	ug/L	0.04	0.10	0.02	2366495
Perylene	ug/L	ND	ND	0.005	2366495
Phenanthrene	ug/L	0.079	0.048	0.005	2366495
Pyrene	ug/L	0.017	0.008	0.005	2366495
Surrogate Recovery (%)					
D10-Anthracene	%	92	93		2366495
D14-Terphenyl	%	98	68		2366495
D8-Acenaphthylene	%	102	95		2366495

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		IE3389		
Sampling Date		2010/10/13 13:10		
COC Number		N/A		
	Units	**GB-CHANNEL-3-BACK-UP P#HM6835 Lab-Dup**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons				
1-Methylnaphthalene	ug/L	0.03	0.01	2366495
2-Methylnaphthalene	ug/L	0.02	0.01	2366495
Acenaphthene	ug/L	0.038	0.005	2366495
Acenaphthylene	ug/L	ND	0.005	2366495
Anthracene	ug/L	0.031	0.005	2366495
Benzo(a)anthracene	ug/L	ND	0.005	2366495
Benzo(a)pyrene	ug/L	ND	0.005	2366495
Benzo(b)fluoranthene	ug/L	ND	0.005	2366495
Benzo(g,h,i)perylene	ug/L	ND	0.005	2366495
Benzo(j)fluoranthene	ug/L	ND	0.005	2366495
Benzo(k)fluoranthene	ug/L	ND	0.005	2366495
Chrysene	ug/L	ND	0.005	2366495
Dibenz(a,h)anthracene	ug/L	ND	0.005	2366495
Fluoranthene	ug/L	0.020	0.005	2366495
Fluorene	ug/L	0.031	0.005	2366495
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.005	2366495
Naphthalene	ug/L	0.13	0.02	2366495
Perylene	ug/L	ND	0.005	2366495
Phenanthrene	ug/L	0.067	0.005	2366495
Pyrene	ug/L	0.012	0.005	2366495
Surrogate Recovery (%)				
D10-Anthracene	%	90		2366495
D14-Terphenyl	%	81		2366495
D8-Acenaphthylene	%	90		2366495

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		IE3376	IE3381		
Sampling Date		2010/10/13 11:10	2010/10/13 11:20		
COC Number		N/A	N/A		
	Units	**GB-BASIN-1-BACK-UP P#HM6821**	**GB-BASIN-2-BACK-UP P#HM6827**	**RDL**	**QC Batch**
Petroleum Hydrocarbons					
Benzene	mg/kg	0.062	0.16	0.003	2360668
Leachable Benzene	mg/L		ND	0.01	2366442
Toluene	mg/kg	ND	ND	0.03	2360668
Leachable Toluene	mg/L		ND	0.01	2366442
Ethylbenzene	mg/kg	ND	ND	0.01	2360668
Leachable Ethylbenzene	mg/L		ND	0.01	2366442
Xylene (Total)	mg/kg	ND	ND	0.05	2360668
Leachable Xylene (Total)	mg/L		ND	0.02	2366442
C6 - C10 (less BTEX)	mg/kg	ND	9	3	2360668
Leachable C6 - C10 (less BTEX)	mg/L		ND	0.1	2366442
>C10-C16 Hydrocarbons	mg/kg	160	310	10	2361259
>C16-C21 Hydrocarbons	mg/kg	210	370	10	2361259
>C21-<C32 Hydrocarbons	mg/kg	660	1100	15	2361259
Modified TPH (Tier1)	mg/kg	1000	1800	20	2360731
Reached Baseline at C32	mg/kg	No	No	N/A	2361259
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (1)	N/A	2361259
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	102	88		2361259
n-Dotriacontane - Extractable	%	103	111		2361259
Leachable Isobutylbenzene - Volatile	%		101		2366442
Isobutylbenzene - Volatile	%	110	93		2360668

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Weathered fuel oil fraction. Lube oil fraction.

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Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		IE3382	IE3383		
Sampling Date		2010/10/13 10:50	2010/10/13 11:35		
COC Number		N/A	N/A		
	Units	**GB-BASIN-3-BACK-UP P#HM6828**	**GB-BASIN-4-BACK-UP P#HM6829**	**RDL**	**QC Batch**
Petroleum Hydrocarbons					
Benzene	mg/kg	0.034	0.16	0.003	2360668
Leachable Benzene	mg/L		ND	0.01	2366442
Toluene	mg/kg	ND	ND	0.03	2360668
Leachable Toluene	mg/L		ND	0.01	2366442
Ethylbenzene	mg/kg	0.07	ND	0.01	2360668
Leachable Ethylbenzene	mg/L		ND	0.01	2366442
Xylene (Total)	mg/kg	ND	ND	0.05	2360668
Leachable Xylene (Total)	mg/L		ND	0.02	2366442
C6 - C10 (less BTEX)	mg/kg	11	11	3	2360668
Leachable C6 - C10 (less BTEX)	mg/L		ND	0.1	2366442
>C10-C16 Hydrocarbons	mg/kg	350	360	10	2361259
>C16-C21 Hydrocarbons	mg/kg	490	470	10	2361259
>C21-<C32 Hydrocarbons	mg/kg	1200	1500	15	2361259
Modified TPH (Tier1)	mg/kg	2100	2300	20	2360731
Reached Baseline at C32	mg/kg	No	No	N/A	2361259
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (1)	N/A	2361259
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	88	88		2361259
n-Dotriacontane - Extractable	%	106	107		2361259
Leachable Isobutylbenzene - Volatile	%		104		2366442
Isobutylbenzene - Volatile	%	103	94		2360668

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Weathered fuel oil fraction. Lube oil fraction.

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Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		IE3383	IE3384		
Sampling Date		2010/10/13 11:35	2010/10/13 12:05		
COC Number		N/A	N/A		
	Units	**GB-BASIN-4-BACK-UP P#HM6829 Lab-Dup**	**GB-BASIN-5-BACK-UP P#HM6830**	**RDL**	**QC Batch**
Petroleum Hydrocarbons					
Benzene	mg/kg		0.13	0.003	2360668
Leachable Benzene	mg/L	ND	ND	0.01	2366442
Toluene	mg/kg		ND	0.03	2360668
Leachable Toluene	mg/L	ND	ND	0.01	2366442
Ethylbenzene	mg/kg		ND	0.01	2360668
Leachable Ethylbenzene	mg/L	ND	ND	0.01	2366442
Xylene (Total)	mg/kg		ND	0.05	2360668
Leachable Xylene (Total)	mg/L	ND	ND	0.02	2366442
C6 - C10 (less BTEX)	mg/kg		20	3	2360668
Leachable C6 - C10 (less BTEX)	mg/L	ND	ND	0.1	2366442
>C10-C16 Hydrocarbons	mg/kg		1300	10	2361259
>C16-C21 Hydrocarbons	mg/kg		1300	10	2361259
>C21-<C32 Hydrocarbons	mg/kg		3100	15	2361259
Modified TPH (Tier1)	mg/kg		5700	20	2360731
Reached Baseline at C32	mg/kg		No	N/A	2361259
Hydrocarbon Resemblance	mg/kg		COMMENT (1)	N/A	2361259
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%		93		2361259
n-Dotriacontane - Extractable	%		115		2361259
Leachable Isobutylbenzene - Volatile	%	102	94		2366442
Isobutylbenzene - Volatile	%		79		2360668

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Weathered fuel oil fraction. Lube oil fraction.

Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		IE3385	IE3386		
Sampling Date		2010/10/13 12:20	2010/10/13 11:10		
COC Number		N/A	N/A		
	Units	**GB-BASIN-6-BACK-UP P#HM6831**	**GB-BASIN-FIELD DUPLICATE-BACK-UP P#HM6832**	**RDL**	**QC Batch**
Petroleum Hydrocarbons					
Benzene	mg/kg	0.014	0.019	0.003	2360668
Toluene	mg/kg	ND	ND	0.03	2360668
Ethylbenzene	mg/kg	ND	ND	0.01	2360668
Xylene (Total)	mg/kg	ND	ND	0.05	2360668
C6 - C10 (less BTEX)	mg/kg	ND	ND	3	2360668
>C10-C16 Hydrocarbons	mg/kg	26	53	10	2361259
>C16-C21 Hydrocarbons	mg/kg	71	95	10	2361259
>C21-<C32 Hydrocarbons	mg/kg	430	410	15	2361259
Modified TPH (Tier1)	mg/kg	520	560	20	2360731
Reached Baseline at C32	mg/kg	No	No	N/A	2361259
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (1)	N/A	2361259
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	100	98		2361259
n-Dotriacontane - Extractable	%	110	106		2361259
Isobutylbenzene - Volatile	%	110	111		2360668

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Weathered fuel oil fraction. Lube oil fraction.

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Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		IE3387	IE3388		
Sampling Date		2010/10/13 12:38	2010/10/13 12:45		
COC Number		N/A	N/A		
	Units	**GB-CHANNEL-1-BACK-UP P#HM6833**	**GB-CHANNEL-2-BACK-UP P#HM6834**	**RDL**	**QC Batch**
Petroleum Hydrocarbons					
Benzene	mg/kg	0.035	0.039	0.003	2360668
Toluene	mg/kg	ND	ND	0.03	2360668
Ethylbenzene	mg/kg	ND	ND	0.01	2360668
Xylene (Total)	mg/kg	ND	ND	0.05	2360668
C6 - C10 (less BTEX)	mg/kg	ND	ND	3	2360668
>C10-C16 Hydrocarbons	mg/kg	25	68	10	2361259
>C16-C21 Hydrocarbons	mg/kg	41	140	10	2361259
>C21-<C32 Hydrocarbons	mg/kg	250	360	15	2361259
Modified TPH (Tier1)	mg/kg	320	570	20	2360731
Reached Baseline at C32	mg/kg	No	No	N/A	2361259
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (2)	N/A	2361259
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	98	105		2361259
n-Dotriacontane - Extractable	%	107	112		2361259
Isobutylbenzene - Volatile	%	104	104		2360668

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) One product in fuel oil range. Lube oil fraction.
(2) One product in fuel / lube range. Unidentified compound(s) in fuel / lube range.

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Maxxam Job #: B0I1355
Report Date: 2011/01/06

Dillon Consulting Limited

Project name: GLACE BAY

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		IE3389		
Sampling Date		2010/10/13 13:10		
COC Number		N/A		
	Units	**GB-CHANNEL-3-BACK-UP P#HM6835**	**RDL**	**QC Batch**
Petroleum Hydrocarbons				
Benzene	mg/kg	0.056	0.003	2360668
Leachable Benzene	mg/L	ND	0.01	2366442
Toluene	mg/kg	0.05	0.03	2360668
Leachable Toluene	mg/L	ND	0.01	2366442
Ethylbenzene	mg/kg	ND	0.01	2360668
Leachable Ethylbenzene	mg/L	ND	0.01	2366442
Xylene (Total)	mg/kg	ND	0.05	2360668
Leachable Xylene (Total)	mg/L	ND	0.02	2366442
C6 - C10 (less BTEX)	mg/kg	ND	3	2360668
Leachable C6 - C10 (less BTEX)	mg/L	ND	0.1	2366442
>C10-C16 Hydrocarbons	mg/kg	19	10	2361259
>C16-C21 Hydrocarbons	mg/kg	22	10	2361259
>C21-<C32 Hydrocarbons	mg/kg	80	15	2361259
Modified TPH (Tier1)	mg/kg	120	20	2360731
Reached Baseline at C32	mg/kg	No	N/A	2361259
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	N/A	2361259
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	101		2361259
n-Dotriacontane - Extractable	%	113		2361259
Leachable Isobutylbenzene - Volatile	%	99		2366442
Isobutylbenzene - Volatile	%	111		2360668

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) One product in fuel oil range. Possible lube oil fraction.

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Maxxam Job #: B0I1355
Report Date: 2011/01/06

Project name: GLACE BAY

GENERAL COMMENTS

O&G: Samples dried to 100 degrees Celsius as per the F4G+ method.

Results relate only to the items tested.

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Dillon Consulting Limited
Attention: Scott McMillan
Client Project #:
P.O. #:
Project name: GLACE BAY

Quality Assurance Report

Maxxam Job Number: DB0I1355

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2360668	ASL	Matrix Spike	Isobutylbenzene - Volatile	2010/12/16		90	%	60 - 140
			Benzene	2010/12/16		80	%	60 - 140
			Toluene	2010/12/16		102	%	60 - 140
			Ethylbenzene	2010/12/16		95	%	60 - 140
			Xylene (Total)	2010/12/16		101	%	60 - 140
		Spiked Blank	Isobutylbenzene - Volatile	2010/12/16		99	%	60 - 140
			Benzene	2010/12/16		96	%	60 - 140
			Toluene	2010/12/16		96	%	60 - 140
			Ethylbenzene	2010/12/16		95	%	60 - 140
			Xylene (Total)	2010/12/16		97	%	60 - 140
		Method Blank	Isobutylbenzene - Volatile	2010/12/16		103	%	60 - 140
			Benzene	2010/12/16	ND, RDL=0.003		mg/kg	
			Toluene	2010/12/16	ND, RDL=0.03		mg/kg	
			Ethylbenzene	2010/12/16	ND, RDL=0.01		mg/kg	
			Xylene (Total)	2010/12/16	ND, RDL=0.05		mg/kg	
			C6 - C10 (less BTEX)	2010/12/16	ND, RDL=3		mg/kg	
		RPD	Benzene	2010/12/16	NC		%	50
			Toluene	2010/12/16	NC		%	50
			Ethylbenzene	2010/12/16	NC		%	50
			Xylene (Total)	2010/12/16	NC		%	50
			C6 - C10 (less BTEX)	2010/12/16	NC		%	50
2361259	SHR	Matrix Spike	Isobutylbenzene - Extractable	2010/12/17		100	%	30 - 130
			n-Dotriacontane - Extractable	2010/12/17		98	%	30 - 130
			>C10-C16 Hydrocarbons	2010/12/17		92	%	30 - 130
			>C16-C21 Hydrocarbons	2010/12/17		86	%	30 - 130
			>C21-<C32 Hydrocarbons	2010/12/17		NC	%	30 - 130
		Spiked Blank	Isobutylbenzene - Extractable	2010/12/17		99	%	30 - 130
			n-Dotriacontane - Extractable	2010/12/17		92	%	30 - 130
			>C10-C16 Hydrocarbons	2010/12/17		94	%	30 - 130
			>C16-C21 Hydrocarbons	2010/12/17		96	%	30 - 130
			>C21-<C32 Hydrocarbons	2010/12/17		113	%	30 - 130
		Method Blank	Isobutylbenzene - Extractable	2010/12/17		96	%	30 - 130
			n-Dotriacontane - Extractable	2010/12/17		96	%	30 - 130
			>C10-C16 Hydrocarbons	2010/12/17	ND, RDL=10		mg/kg	
			>C16-C21 Hydrocarbons	2010/12/17	ND, RDL=10		mg/kg	
			>C21-<C32 Hydrocarbons	2010/12/17	ND, RDL=15		mg/kg	
		RPD	>C10-C16 Hydrocarbons	2010/12/17	NC		%	50
			>C16-C21 Hydrocarbons	2010/12/17	NC		%	50
			>C21-<C32 Hydrocarbons	2010/12/17	10.6		%	50
2366254	JWH	Method Blank	Sample Weight (as received)	2010/12/22	50		g	
		RPD [IE3389-01]	Sample Weight (as received)	2010/12/22	0		%	N/A
2366255	JWH	Method Blank	Final pH	2010/12/22	4.25		N/A	
		RPD [IE3389-01]	Final pH	2010/12/22	0.5		%	N/A
2366442	THL	Matrix Spike [IE3384-01]	Leachable Isobutylbenzene - Volatile	2010/12/23		99	%	70 - 130
			Leachable Benzene	2010/12/23		104	%	70 - 130
			Leachable Toluene	2010/12/23		104	%	70 - 130
			Leachable Ethylbenzene	2010/12/23		100	%	70 - 130
			Leachable Xylene (Total)	2010/12/23		106	%	70 - 130
		Spiked Blank	Leachable Isobutylbenzene - Volatile	2010/12/23		85	%	70 - 130
			Leachable Benzene	2010/12/23		97	%	70 - 130
			Leachable Toluene	2010/12/23		93	%	70 - 130
			Leachable Ethylbenzene	2010/12/23		89	%	70 - 130
			Leachable Xylene (Total)	2010/12/23		94	%	70 - 130
		Method Blank	Leachable Isobutylbenzene - Volatile	2010/12/23		100	%	70 - 130

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Dillon Consulting Limited
Attention: Scott McMillan
Client Project #:
P.O. #:
Project name: GLACE BAY

Quality Assurance Report (Continued)

Maxxam Job Number: DB0I1355

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2366442	THL	Method Blank	Leachable Benzene	2010/12/23	ND, RDL=0.01		mg/L	
			Leachable Toluene	2010/12/23	ND, RDL=0.01		mg/L	
			Leachable Ethylbenzene	2010/12/23	ND, RDL=0.01		mg/L	
			Leachable Xylene (Total)	2010/12/23	ND, RDL=0.02		mg/L	
			Leachable C6 - C10 (less BTEX)	2010/12/23	ND, RDL=0.1		mg/L	
		RPD [IE3383-01]	Leachable Benzene	2010/12/23	NC		%	40
			Leachable Toluene	2010/12/23	NC		%	40
			Leachable Ethylbenzene	2010/12/23	NC		%	40
			Leachable Xylene (Total)	2010/12/23	NC		%	40
			Leachable C6 - C10 (less BTEX)	2010/12/23	NC		%	40
2366495	DCF	Leachate Blank	D10-Anthracene	2010/12/29		100	%	30 - 130
			D14-Terphenyl	2010/12/29		95	%	30 - 130
			D8-Acenaphthylene	2010/12/29		117	%	30 - 130
			1-Methylnaphthalene	2010/12/29	ND, RDL=0.01		ug/L	
			2-Methylnaphthalene	2010/12/29	ND, RDL=0.01		ug/L	
			Acenaphthene	2010/12/29	ND, RDL=0.005		ug/L	
			Acenaphthylene	2010/12/29	ND, RDL=0.005		ug/L	
			Anthracene	2010/12/29	ND, RDL=0.005		ug/L	
			Benzo(a)anthracene	2010/12/29	ND, RDL=0.005		ug/L	
			Benzo(a)pyrene	2010/12/29	ND, RDL=0.005		ug/L	
			Benzo(b)fluoranthene	2010/12/29	ND, RDL=0.005		ug/L	
			Benzo(g,h,i)perylene	2010/12/29	ND, RDL=0.005		ug/L	
			Benzo(j)fluoranthene	2010/12/29	ND, RDL=0.005		ug/L	
			Benzo(k)fluoranthene	2010/12/29	ND, RDL=0.005		ug/L	
			Chrysene	2010/12/29	ND, RDL=0.005		ug/L	
			Dibenz(a,h)anthracene	2010/12/29	ND, RDL=0.005		ug/L	
			Fluoranthene	2010/12/29	ND, RDL=0.005		ug/L	
			Fluorene	2010/12/29	ND, RDL=0.005		ug/L	
			Indeno(1,2,3-cd)pyrene	2010/12/29	ND, RDL=0.005		ug/L	
			Naphthalene	2010/12/29	ND, RDL=0.02		ug/L	
			Perylene	2010/12/29	ND, RDL=0.005		ug/L	
			Phenanthrene	2010/12/29	ND, RDL=0.005		ug/L	
			Pyrene	2010/12/29	ND, RDL=0.005		ug/L	
		Spiked Blank	D10-Anthracene	2010/12/29		126	%	30 - 130
			D14-Terphenyl	2010/12/29		97	%	30 - 130
			D8-Acenaphthylene	2010/12/29		93	%	30 - 130
			1-Methylnaphthalene	2010/12/29		104	%	30 - 130
			2-Methylnaphthalene	2010/12/29		82	%	30 - 130
			Acenaphthene	2010/12/29		97	%	30 - 130
			Acenaphthylene	2010/12/29		90	%	30 - 130
			Anthracene	2010/12/29		132 (1)	%	30 - 130
			Benzo(a)anthracene	2010/12/29		101	%	30 - 130
			Benzo(a)pyrene	2010/12/29		107	%	30 - 130
			Benzo(b)fluoranthene	2010/12/29		90	%	30 - 130
			Benzo(g,h,i)perylene	2010/12/29		110	%	30 - 130
			Benzo(j)fluoranthene	2010/12/29		126	%	30 - 130
			Benzo(k)fluoranthene	2010/12/29		112	%	30 - 130
			Chrysene	2010/12/29		99	%	30 - 130
			Dibenz(a,h)anthracene	2010/12/29		92	%	30 - 130
			Fluoranthene	2010/12/29		119	%	30 - 130
			Fluorene	2010/12/29		86	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2010/12/29		97	%	30 - 130
			Naphthalene	2010/12/29		85	%	30 - 130
			Perylene	2010/12/29		106	%	30 - 130
			Phenanthrene	2010/12/29		98	%	30 - 130

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Quality Assurance Report (Continued)

Maxxam Job Number: DB0I1355

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2366495	DCF	Spiked Blank	Pyrene	2010/12/29		122	%	30 - 130
		Method Blank	D10-Anthracene	2010/12/24		114	%	30 - 130
			D14-Terphenyl	2010/12/24		88	%	30 - 130
			D8-Acenaphthylene	2010/12/24		86	%	30 - 130
			1-Methylnaphthalene	2010/12/24	ND, RDL=0.01		ug/L	
			2-Methylnaphthalene	2010/12/24	ND, RDL=0.01		ug/L	
			Acenaphthene	2010/12/24	ND, RDL=0.005		ug/L	
			Acenaphthylene	2010/12/24	ND, RDL=0.005		ug/L	
			Anthracene	2010/12/24	ND, RDL=0.005		ug/L	
			Benzo(a)anthracene	2010/12/24	ND, RDL=0.005		ug/L	
			Benzo(a)pyrene	2010/12/24	ND, RDL=0.005		ug/L	
			Benzo(b)fluoranthene	2010/12/24	ND, RDL=0.005		ug/L	
			Benzo(g,h,i)perylene	2010/12/24	ND, RDL=0.005		ug/L	
			Benzo(j)fluoranthene	2010/12/24	ND, RDL=0.005		ug/L	
			Benzo(k)fluoranthene	2010/12/24	ND, RDL=0.005		ug/L	
			Chrysene	2010/12/24	ND, RDL=0.005		ug/L	
			Dibenz(a,h)anthracene	2010/12/24	ND, RDL=0.005		ug/L	
			Fluoranthene	2010/12/24	ND, RDL=0.005		ug/L	
			Fluorene	2010/12/24	ND, RDL=0.005		ug/L	
			Indeno(1,2,3-cd)pyrene	2010/12/24	ND, RDL=0.005		ug/L	
			Naphthalene	2010/12/24	ND, RDL=0.02		ug/L	
			Perylene	2010/12/24	ND, RDL=0.005		ug/L	
			Phenanthrene	2010/12/24	ND, RDL=0.005		ug/L	
			Pyrene	2010/12/24	ND, RDL=0.005		ug/L	
		RPD [IE3389-01]	1-Methylnaphthalene	2010/12/24	NC		%	40
			2-Methylnaphthalene	2010/12/24	NC		%	40
			Acenaphthene	2010/12/24	NC		%	40
			Acenaphthylene	2010/12/24	NC		%	40
			Anthracene	2010/12/24	NC		%	40
			Benzo(a)anthracene	2010/12/24	NC		%	40
			Benzo(a)pyrene	2010/12/24	NC		%	40
			Benzo(b)fluoranthene	2010/12/24	NC		%	40
			Benzo(g,h,i)perylene	2010/12/24	NC		%	40
			Benzo(j)fluoranthene	2010/12/24	NC		%	40
			Benzo(k)fluoranthene	2010/12/24	NC		%	40
			Chrysene	2010/12/24	NC		%	40
			Dibenz(a,h)anthracene	2010/12/24	NC		%	40
			Fluoranthene	2010/12/24	NC		%	40
			Fluorene	2010/12/24	NC		%	40
			Indeno(1,2,3-cd)pyrene	2010/12/24	NC		%	40
			Naphthalene	2010/12/24	NC		%	40
			Perylene	2010/12/24	NC		%	40
			Phenanthrene	2010/12/24	33.5		%	40
			Pyrene	2010/12/24	NC		%	40
2366550	DML	Matrix Spike	Total Oil & Grease	2011/01/04		NC	%	30 - 130
		Spiked Blank	Total Oil & Grease	2011/01/04		80	%	30 - 130
		Method Blank	Total Oil & Grease	2011/01/04	ND, RDL=100		mg/kg	
		RPD	Total Oil & Grease	2011/01/04	6.8		%	50

N/A = Not Applicable
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

This document is in electronic format, hard copy is available on request.

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Dillon Consulting Limited
Attention: Scott McMillan
Client Project #:
P.O. #:
Project name: GLACE BAY

Quality Assurance Report (Continued)

Maxxam Job Number: DB0I1355

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) Spike: < 10 % of compounds in multi-component analysis in violation.

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Your C.O.C. #: N/A

Attention: Scott McMillan
Dillon Consulting Limited
Halifax
137 Chain Lake Dr
Suite 100
Halifax , NS
B3S 1B3

Report Date: 2011/03/29

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B138362
Received: 2011/03/22, 13:23

Sample Matrix: Soil
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Metals Leach. Tot. MS - N-per	3	2011/03/24	2011/03/24	ATL SOP 00059 R1	Based on EPA6020A
Metals Leach. Tot. MS - N-per	4	2011/03/24	2011/03/25	ATL SOP 00059 R1	Based on EPA6020A
SPLP Inorganic extraction - pH	4	N/A	2011/03/24	ATL SOP 00036 R4	Based on EPA1312
SPLP Inorganic extraction - Weight	4	N/A	2011/03/24	ATL SOP 00036 R4	Based on EPA1312
TCLP Inorganic extraction - pH	3	N/A	2011/03/24	ATL SOP-00035 R4	Based on EPA1311
TCLP Inorganic extraction - Weight	3	N/A	2011/03/24	ATL SOP-00035 R4	Based on EPA1311

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

HEATHER MACUMBER, Bedford
Email: HMacumber@maxxam.ca
Phone# (902) 420-0203

==========

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Total cover pages: 1

Dillon Consulting Limited

Maxxam Job #: B138362
Report Date: 2011/03/29

ATLANTIC SPLP LEACHATE + ICP-MS METALS (SOIL)

Maxxam ID		IZ1946	IZ1952	IZ1953	IZ1955		
Sampling Date		2010/10/10	2010/10/10	2010/10/10	2010/10/10		
COC Number		N/A	N/A	N/A	N/A		
	Units	**GB-BASIN-2**	**GB-BASIN-3**	**GB-BASIN-4 AND BASIN 5**	**GB-BASIN-6**	**RDL**	**QC Batch**
Charge/Prep Analysis							
Sample Weight (as received)	g	50	40	50	50	N/A	2439203
Final pH	N/A	8.17	7.96	7.61	8.41	N/A	2439205
Metals							
Leachable Aluminum (Al)	ug/L	230	190	110	3500	100	2439275
Leachable Antimony (Sb)	ug/L	ND	ND	ND	ND	20	2439275
Leachable Arsenic (As)	ug/L	ND	ND	ND	ND	20	2439275
Leachable Barium (Ba)	ug/L	ND	73	ND	ND	50	2439275
Leachable Beryllium (Be)	ug/L	ND	ND	ND	ND	20	2439275
Leachable Boron (B)	ug/L	ND	ND	ND	ND	500	2439275
Leachable Cadmium (Cd)	ug/L	ND	ND	ND	ND	3	2439275
Leachable Calcium (Ca)	ug/L	30000	30000	54000	14000	1000	2439275
Leachable Chromium (Cr)	ug/L	ND	ND	ND	ND	20	2439275
Leachable Cobalt (Co)	ug/L	ND	ND	ND	ND	10	2439275
Leachable Copper (Cu)	ug/L	ND	ND	ND	ND	20	2439275
Leachable Iron (Fe)	ug/L	ND	ND	ND	3700	500	2439275
Leachable Lead (Pb)	ug/L	ND	ND	ND	9	5	2439275
Leachable Lithium (Li)	ug/L	ND	ND	ND	ND	20	2439275
Leachable Magnesium (Mg)	ug/L	22000	26000	38000	17000	1000	2439275
Leachable Manganese (Mn)	ug/L	ND	58	130	ND	20	2439275
Leachable Molybdenum (Mo)	ug/L	89	61	35	28	20	2439275
Leachable Nickel (Ni)	ug/L	ND	ND	ND	ND	20	2439275
Leachable Potassium (K)	ug/L	15000	14000	17000	12000	1000	2439275
Leachable Selenium (Se)	ug/L	ND	ND	ND	ND	10	2439275
Leachable Silver (Ag)	ug/L	ND	ND	ND	ND	5	2439275
Leachable Strontium (Sr)	ug/L	260	360	420	160	50	2439275
Leachable Thallium (Tl)	ug/L	ND	ND	ND	ND	1	2439275
Leachable Tin (Sn)	ug/L	ND	ND	ND	ND	20	2439275
Leachable Uranium (U)	ug/L	ND	ND	ND	2	1	2439275
Leachable Vanadium (V)	ug/L	ND	ND	ND	ND	20	2439275

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Dillon Consulting Limited

Maxxam Job #: B138362
Report Date: 2011/03/29

ATLANTIC SPLP LEACHATE + ICP-MS METALS (SOIL)

Maxxam ID		IZ1946	IZ1952	IZ1953	IZ1955		
Sampling Date		2010/10/10	2010/10/10	2010/10/10	2010/10/10		
COC Number		N/A	N/A	N/A	N/A		
	Units	**GB-BASIN-2**	**GB-BASIN-3**	**GB-BASIN-4 AND BASIN 5**	**GB-BASIN-6**	**RDL**	**QC Batch**
Leachable Zinc (Zn)	ug/L	ND	ND	ND	ND	50	2439275

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B138362
Report Date: 2011/03/29

ATLANTIC TCLP LEACHATE + METALS (SOIL)

Maxxam ID		IZ2177	IZ2178	IZ2179		
Sampling Date						
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-2**	**GB-BASIN-3**	**GB-BASIN-4 AND BASIN 5**	**RDL**	**QC Batch**
Inorganics						
Sample Weight (as received)	g	50	50	50	N/A	2439196
Initial pH	N/A	8.4	7.6	7.4		2439198
Final pH	N/A	5.2	5.1	5.0		2439198
Metals						
Leachable Aluminum (Al)	ug/L	1200	2200	2200	100	2439270
Leachable Antimony (Sb)	ug/L	ND	ND	ND	20	2439270
Leachable Arsenic (As)	ug/L	ND	ND	ND	20	2439270
Leachable Barium (Ba)	ug/L	380	360	300	50	2439270
Leachable Beryllium (Be)	ug/L	ND	ND	ND	20	2439270
Leachable Boron (B)	ug/L	510	ND	740	500	2439270
Leachable Cadmium (Cd)	ug/L	ND	ND	5	3	2439270
Leachable Calcium (Ca)	ug/L	210000	100000	100000	1000	2439270
Leachable Chromium (Cr)	ug/L	ND	ND	ND	20	2439270
Leachable Cobalt (Co)	ug/L	34	43	34	10	2439270
Leachable Copper (Cu)	ug/L	ND	ND	ND	20	2439270
Leachable Iron (Fe)	ug/L	140000	120000	110000	500	2439270
Leachable Lead (Pb)	ug/L	63	51	87	5	2439270
Leachable Lithium (Li)	ug/L	77	79	84	20	2439270
Leachable Magnesium (Mg)	ug/L	65000	51000	62000	1000	2439270
Leachable Manganese (Mn)	ug/L	4300	3600	2600	20	2439270
Leachable Molybdenum (Mo)	ug/L	ND	ND	ND	20	2439270
Leachable Nickel (Ni)	ug/L	93	88	86	20	2439270
Leachable Potassium (K)	ug/L	20000	20000	20000	1000	2439270
Leachable Selenium (Se)	ug/L	ND	ND	ND	10	2439270
Leachable Silver (Ag)	ug/L	ND	ND	ND	5	2439270
Leachable Strontium (Sr)	ug/L	1300	1100	1000	50	2439270
Leachable Thallium (Tl)	ug/L	ND	ND	ND	1	2439270
Leachable Tin (Sn)	ug/L	ND	ND	ND	20	2439270
Leachable Uranium (U)	ug/L	5	5	4	1	2439270

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Dillon Consulting Limited

Maxxam Job #: B138362
Report Date: 2011/03/29

ATLANTIC TCLP LEACHATE + METALS (SOIL)

Maxxam ID		IZ2177	IZ2178	IZ2179		
Sampling Date						
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-2**	**GB-BASIN-3**	**GB-BASIN-4 AND BASIN 5**	**RDL**	**QC Batch**
Leachable Vanadium (V)	ug/L	ND	ND	ND	20	2439270
Leachable Zinc (Zn)	ug/L	1000	1100	1000	50	2439270

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Dillon Consulting Limited

Maxxam Job #: B138362
Report Date: 2011/03/29

GENERAL COMMENTS

Sample IZ1952-01: Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Results relate only to the items tested.

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Dillon Consulting Limited
Attention: Scott McMillan
Client Project #:
P.O. #:
Project name:

Quality Assurance Report

Maxxam Job Number: DB138362

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2439196	JWH	Method Blank	Sample Weight (as received)	2011/03/24	50		g	
2439203	JWH	Method Blank	Sample Weight (as received)	2011/03/24	50		g	
		RPD	Sample Weight (as received)	2011/03/24	0		%	N/A
2439205	JWH	Method Blank	Final pH	2011/03/24	4.29		N/A	
		RPD	Final pH	2011/03/24	1.7		%	N/A
2439270	MLB	Method Blank	Leachable Aluminum (Al)	2011/03/24	ND, RDL=100		ug/L	
			Leachable Antimony (Sb)	2011/03/24	ND, RDL=20		ug/L	
			Leachable Arsenic (As)	2011/03/24	ND, RDL=20		ug/L	
			Leachable Barium (Ba)	2011/03/24	ND, RDL=50		ug/L	
			Leachable Beryllium (Be)	2011/03/24	ND, RDL=20		ug/L	
			Leachable Boron (B)	2011/03/24	ND, RDL=500		ug/L	
			Leachable Cadmium (Cd)	2011/03/24	ND, RDL=3		ug/L	
			Leachable Calcium (Ca)	2011/03/24	ND, RDL=1000		ug/L	
			Leachable Chromium (Cr)	2011/03/24	ND, RDL=20		ug/L	
			Leachable Cobalt (Co)	2011/03/24	ND, RDL=10		ug/L	
			Leachable Copper (Cu)	2011/03/24	ND, RDL=20		ug/L	
			Leachable Iron (Fe)	2011/03/24	ND, RDL=500		ug/L	
			Leachable Lead (Pb)	2011/03/24	ND, RDL=5		ug/L	
			Leachable Lithium (Li)	2011/03/24	ND, RDL=20		ug/L	
			Leachable Magnesium (Mg)	2011/03/24	ND, RDL=1000		ug/L	
			Leachable Manganese (Mn)	2011/03/24	ND, RDL=20		ug/L	
			Leachable Molybdenum (Mo)	2011/03/24	ND, RDL=20		ug/L	
			Leachable Nickel (Ni)	2011/03/24	ND, RDL=20		ug/L	
			Leachable Potassium (K)	2011/03/24	ND, RDL=1000		ug/L	
			Leachable Selenium (Se)	2011/03/24	ND, RDL=10		ug/L	
			Leachable Silver (Ag)	2011/03/24	ND, RDL=5		ug/L	
			Leachable Strontium (Sr)	2011/03/24	ND, RDL=50		ug/L	
			Leachable Thallium (Tl)	2011/03/24	ND, RDL=1		ug/L	
			Leachable Tin (Sn)	2011/03/24	ND, RDL=20		ug/L	
			Leachable Uranium (U)	2011/03/24	ND, RDL=1		ug/L	
			Leachable Vanadium (V)	2011/03/24	ND, RDL=20		ug/L	
			Leachable Zinc (Zn)	2011/03/24	ND, RDL=50		ug/L	
2439275	MLB	Method Blank	Leachable Aluminum (Al)	2011/03/25	ND, RDL=100		ug/L	
			Leachable Antimony (Sb)	2011/03/25	ND, RDL=20		ug/L	
			Leachable Arsenic (As)	2011/03/25	ND, RDL=20		ug/L	
			Leachable Barium (Ba)	2011/03/25	ND, RDL=50		ug/L	
			Leachable Beryllium (Be)	2011/03/25	ND, RDL=20		ug/L	
			Leachable Boron (B)	2011/03/25	ND, RDL=500		ug/L	
			Leachable Cadmium (Cd)	2011/03/25	ND, RDL=3		ug/L	
			Leachable Calcium (Ca)	2011/03/25	ND, RDL=1000		ug/L	
			Leachable Chromium (Cr)	2011/03/25	ND, RDL=20		ug/L	
			Leachable Cobalt (Co)	2011/03/25	ND, RDL=10		ug/L	
			Leachable Copper (Cu)	2011/03/25	ND, RDL=20		ug/L	
			Leachable Iron (Fe)	2011/03/25	ND, RDL=500		ug/L	
			Leachable Lead (Pb)	2011/03/25	ND, RDL=5		ug/L	
			Leachable Lithium (Li)	2011/03/25	ND, RDL=20		ug/L	
			Leachable Magnesium (Mg)	2011/03/25	ND, RDL=1000		ug/L	
			Leachable Manganese (Mn)	2011/03/25	ND, RDL=20		ug/L	
			Leachable Molybdenum (Mo)	2011/03/25	ND, RDL=20		ug/L	
			Leachable Nickel (Ni)	2011/03/25	ND, RDL=20		ug/L	
			Leachable Potassium (K)	2011/03/25	ND, RDL=1000		ug/L	
			Leachable Selenium (Se)	2011/03/25	ND, RDL=10		ug/L	
			Leachable Silver (Ag)	2011/03/25	ND, RDL=5		ug/L	
			Leachable Strontium (Sr)	2011/03/25	ND, RDL=50		ug/L	
			Leachable Thallium (Tl)	2011/03/25	ND, RDL=1		ug/L	

Dillon Consulting Limited
Attention: Scott McMillan
Client Project #:
P.O. #:
Project name:

Quality Assurance Report (Continued)

Maxxam Job Number: DB138362

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2439275	MLB	Method Blank	Leachable Tin (Sn)	2011/03/25	ND, RDL=20		ug/L	
			Leachable Uranium (U)	2011/03/25	ND, RDL=1		ug/L	
			Leachable Vanadium (V)	2011/03/25	ND, RDL=20		ug/L	
			Leachable Zinc (Zn)	2011/03/25	ND, RDL=50		ug/L	

N/A = Not Applicable
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Site: GLACE BAY
Your C.O.C. #: N/A

Attention: Scott McMillan
Dillon Consulting Limited
Halifax
137 Chain Lake Dr
Suite 100
Halifax , NS
B3S 1B3

Report Date: 2011/05/05

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B157643
Received: 2011/04/28, 11:33

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Metals Water Total MS	4	2011/04/29	2011/04/30	ATL SOP 00059 R1	Based on EPA6020A

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

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HEATHER MACUMBER, Bedford
Email: HMacumber@maxxam.ca
Phone# (902) 420-0203

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Total cover pages: 1

Dillon Consulting Limited

Maxxam Job #: B157643
Report Date: 2011/05/05

Project name: GLACE BAY

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JI0732	JI0733	JI0734		
Sampling Date		2010/10/10	2010/10/10	2010/10/10		
COC Number		N/A	N/A	N/A		
	Units	**GB-BASIN-2 (P#IZ1946)**	**GB-BASIN-3 (P#IZ1952)**	**GB-BASIN-4+5 (P#IZ1953)**	**RDL**	**QC Batch**
Metals						
Total Aluminum (Al)	ug/L	135	162	91.5	5.0	2439277
Total Antimony (Sb)	ug/L	2.3	1.4	1.1	1.0	2439277
Total Arsenic (As)	ug/L	2.1	1.8	2.5	1.0	2439277
Total Barium (Ba)	ug/L	36.9	67.5	41.7	1.0	2439277
Total Beryllium (Be)	ug/L	ND	ND	ND	1.0	2439277
Total Bismuth (Bi)	ug/L	ND	ND	ND	2.0	2439277
Total Boron (B)	ug/L	269	284	321	50	2439277
Total Cadmium (Cd)	ug/L	ND	ND	ND	0.017	2439277
Total Calcium (Ca)	ug/L	31000	30700	53500	100	2439277
Total Chromium (Cr)	ug/L	ND	ND	ND	1.0	2439277
Total Cobalt (Co)	ug/L	ND	ND	0.55	0.40	2439277
Total Copper (Cu)	ug/L	ND	ND	ND	2.0	2439277
Total Iron (Fe)	ug/L	ND	ND	ND	50	2439277
Total Lead (Pb)	ug/L	ND	ND	ND	0.50	2439277
Total Magnesium (Mg)	ug/L	23300	25400	37900	100	2439277
Total Manganese (Mn)	ug/L	15.6	53.4	127	2.0	2439277
Total Molybdenum (Mo)	ug/L	92.5	58.3	33.3	2.0	2439277
Total Nickel (Ni)	ug/L	ND	ND	ND	2.0	2439277
Total Potassium (K)	ug/L	15400	13700	17300	100	2439277
Total Selenium (Se)	ug/L	ND	ND	ND	1.0	2439277
Total Silver (Ag)	ug/L	ND	ND	ND	0.10	2439277
Total Sodium (Na)	ug/L	207000	197000	273000	100	2439277
Total Strontium (Sr)	ug/L	258	342	425	2.0	2439277
Total Thallium (Tl)	ug/L	ND	ND	ND	0.10	2439277
Total Tin (Sn)	ug/L	ND	ND	ND	2.0	2439277
Total Titanium (Ti)	ug/L	2.8	2.0	ND	2.0	2439277
Total Uranium (U)	ug/L	0.96	0.66	0.36	0.10	2439277
Total Vanadium (V)	ug/L	ND	ND	ND	2.0	2439277
Total Zinc (Zn)	ug/L	ND	ND	ND	5.0	2439277

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B157643
Report Date: 2011/05/05

Dillon Consulting Limited

Project name: GLACE BAY

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JI0735		
Sampling Date		2010/10/10		
COC Number		N/A		
	Units	**GB-BASIN-6 (P#IZ1955)**	**RDL**	**QC Batch**
Metals				
Total Aluminum (Al)	ug/L	2490	5.0	2439277
Total Antimony (Sb)	ug/L	2.5	1.0	2439277
Total Arsenic (As)	ug/L	10.8	1.0	2439277
Total Barium (Ba)	ug/L	29.1	1.0	2439277
Total Beryllium (Be)	ug/L	ND	1.0	2439277
Total Bismuth (Bi)	ug/L	ND	2.0	2439277
Total Boron (B)	ug/L	400	50	2439277
Total Cadmium (Cd)	ug/L	0.057	0.017	2439277
Total Calcium (Ca)	ug/L	14200	100	2439277
Total Chromium (Cr)	ug/L	3.2	1.0	2439277
Total Cobalt (Co)	ug/L	1.72	0.40	2439277
Total Copper (Cu)	ug/L	12.8	2.0	2439277
Total Iron (Fe)	ug/L	3570	50	2439277
Total Lead (Pb)	ug/L	8.80	0.50	2439277
Total Magnesium (Mg)	ug/L	16500	100	2439277
Total Manganese (Mn)	ug/L	16.3	2.0	2439277
Total Molybdenum (Mo)	ug/L	28.3	2.0	2439277
Total Nickel (Ni)	ug/L	3.8	2.0	2439277
Total Potassium (K)	ug/L	11700	100	2439277
Total Selenium (Se)	ug/L	ND	1.0	2439277
Total Silver (Ag)	ug/L	ND	0.10	2439277
Total Sodium (Na)	ug/L	183000	100	2439277
Total Strontium (Sr)	ug/L	147	2.0	2439277
Total Thallium (Tl)	ug/L	ND	0.10	2439277
Total Tin (Sn)	ug/L	ND	2.0	2439277
Total Titanium (Ti)	ug/L	56.8	2.0	2439277
Total Uranium (U)	ug/L	2.07	0.10	2439277
Total Vanadium (V)	ug/L	11.4	2.0	2439277
Total Zinc (Zn)	ug/L	20.8	5.0	2439277

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Dillon Consulting Limited

Maxxam Job #: B157643
Report Date: 2011/05/05

Project name: GLACE BAY

GENERAL COMMENTS

The digested leachate blank contained sodium at 360 ug/L, aluminum at 39 ug/L, titanium at 2 ug/L and lead at 0.6 ug/L. All other parameters were non-detect.

Results relate only to the items tested.

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Dillon Consulting Limited
Attention: Scott McMillan
Client Project #:
P.O. #:
Project name: GLACE BAY

Quality Assurance Report

Maxxam Job Number: DB157643

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2439277	MLB	Matrix Spike	Total Aluminum (Al)	2011/03/25		106	%	80 - 120
			Total Antimony (Sb)	2011/03/25		106	%	80 - 120
			Total Arsenic (As)	2011/03/25		99	%	80 - 120
			Total Barium (Ba)	2011/03/25		99	%	80 - 120
			Total Beryllium (Be)	2011/03/25		102	%	80 - 120
			Total Bismuth (Bi)	2011/03/25		102	%	80 - 120
			Total Boron (B)	2011/03/25		106	%	80 - 120
			Total Cadmium (Cd)	2011/03/25		102	%	80 - 120
			Total Calcium (Ca)	2011/03/25		101	%	80 - 120
			Total Chromium (Cr)	2011/03/25		101	%	80 - 120
			Total Cobalt (Co)	2011/03/25		99	%	80 - 120
			Total Copper (Cu)	2011/03/25		97	%	80 - 120
			Total Iron (Fe)	2011/03/25		104	%	80 - 120
			Total Lead (Pb)	2011/03/25		99	%	80 - 120
			Total Magnesium (Mg)	2011/03/25		105	%	80 - 120
			Total Manganese (Mn)	2011/03/25		NC	%	80 - 120
			Total Molybdenum (Mo)	2011/03/25		105	%	80 - 120
			Total Nickel (Ni)	2011/03/25		100	%	80 - 120
			Total Potassium (K)	2011/03/25		105	%	80 - 120
			Total Selenium (Se)	2011/03/25		100	%	80 - 120
			Total Silver (Ag)	2011/03/25		107	%	80 - 120
			Total Sodium (Na)	2011/03/25		NC	%	80 - 120
			Total Strontium (Sr)	2011/03/25		100	%	80 - 120
			Total Thallium (Tl)	2011/03/25		101	%	80 - 120
			Total Tin (Sn)	2011/03/25		105	%	80 - 120
			Total Titanium (Ti)	2011/03/25		105	%	80 - 120
			Total Uranium (U)	2011/03/25		110	%	80 - 120
			Total Vanadium (V)	2011/03/25		103	%	80 - 120
			Total Zinc (Zn)	2011/03/25		98	%	80 - 120
		Spiked Blank	Total Aluminum (Al)	2011/03/25		109	%	80 - 120
			Total Antimony (Sb)	2011/03/25		104	%	80 - 120
			Total Arsenic (As)	2011/03/25		101	%	80 - 120
			Total Barium (Ba)	2011/03/25		100	%	80 - 120
			Total Beryllium (Be)	2011/03/25		99	%	80 - 120
			Total Bismuth (Bi)	2011/03/25		101	%	80 - 120
			Total Boron (B)	2011/03/25		102	%	80 - 120
			Total Cadmium (Cd)	2011/03/25		102	%	80 - 120
			Total Calcium (Ca)	2011/03/25		103	%	80 - 120
			Total Chromium (Cr)	2011/03/25		104	%	80 - 120
			Total Cobalt (Co)	2011/03/25		101	%	80 - 120
			Total Copper (Cu)	2011/03/25		100	%	80 - 120
			Total Iron (Fe)	2011/03/25		110	%	80 - 120
			Total Lead (Pb)	2011/03/25		98	%	80 - 120
			Total Magnesium (Mg)	2011/03/25		109	%	80 - 120
			Total Manganese (Mn)	2011/03/25		103	%	80 - 120
			Total Molybdenum (Mo)	2011/03/25		104	%	80 - 120
			Total Nickel (Ni)	2011/03/25		102	%	80 - 120
			Total Potassium (K)	2011/03/25		107	%	80 - 120
			Total Selenium (Se)	2011/03/25		101	%	80 - 120
			Total Silver (Ag)	2011/03/25		106	%	80 - 120
			Total Sodium (Na)	2011/03/25		105	%	80 - 120
			Total Strontium (Sr)	2011/03/25		104	%	80 - 120
			Total Thallium (Tl)	2011/03/25		101	%	80 - 120
			Total Tin (Sn)	2011/03/25		108	%	80 - 120
			Total Titanium (Ti)	2011/03/25		109	%	80 - 120

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Dillon Consulting Limited
Attention: Scott McMillan
Client Project #:
P.O. #:
Project name: GLACE BAY

Quality Assurance Report (Continued)

Maxxam Job Number: DB157643

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2439277	MLB	Spiked Blank	Total Uranium (U)	2011/03/25		110	%	80 - 120
			Total Vanadium (V)	2011/03/25		106	%	80 - 120
			Total Zinc (Zn)	2011/03/25		101	%	80 - 120
		Method Blank	Total Aluminum (Al)	2011/03/25	ND, RDL=5.0		ug/L	
			Total Antimony (Sb)	2011/03/25	ND, RDL=1.0		ug/L	
			Total Arsenic (As)	2011/03/25	ND, RDL=1.0		ug/L	
			Total Barium (Ba)	2011/03/25	ND, RDL=1.0		ug/L	
			Total Beryllium (Be)	2011/03/25	ND, RDL=1.0		ug/L	
			Total Bismuth (Bi)	2011/03/25	ND, RDL=2.0		ug/L	
			Total Boron (B)	2011/03/25	ND, RDL=50		ug/L	
			Total Cadmium (Cd)	2011/03/25	ND, RDL=0.017		ug/L	
			Total Calcium (Ca)	2011/03/25	ND, RDL=100		ug/L	
			Total Chromium (Cr)	2011/03/25	ND, RDL=1.0		ug/L	
			Total Cobalt (Co)	2011/03/25	ND, RDL=0.40		ug/L	
			Total Copper (Cu)	2011/03/25	ND, RDL=2.0		ug/L	
			Total Iron (Fe)	2011/03/25	ND, RDL=50		ug/L	
			Total Lead (Pb)	2011/03/25	ND, RDL=0.50		ug/L	
			Total Magnesium (Mg)	2011/03/25	ND, RDL=100		ug/L	
			Total Manganese (Mn)	2011/03/25	ND, RDL=2.0		ug/L	
			Total Molybdenum (Mo)	2011/03/25	ND, RDL=2.0		ug/L	
			Total Nickel (Ni)	2011/03/25	ND, RDL=2.0		ug/L	
			Total Potassium (K)	2011/03/25	ND, RDL=100		ug/L	
			Total Selenium (Se)	2011/03/25	ND, RDL=1.0		ug/L	
			Total Silver (Ag)	2011/03/25	ND, RDL=0.10		ug/L	
			Total Sodium (Na)	2011/03/25	ND, RDL=100		ug/L	
			Total Strontium (Sr)	2011/03/25	ND, RDL=2.0		ug/L	
			Total Thallium (Tl)	2011/03/25	ND, RDL=0.10		ug/L	
			Total Tin (Sn)	2011/03/25	ND, RDL=2.0		ug/L	
			Total Titanium (Ti)	2011/03/25	2.2, RDL=2.0 (1)		ug/L	
			Total Uranium (U)	2011/03/25	ND, RDL=0.10		ug/L	
			Total Vanadium (V)	2011/03/25	ND, RDL=2.0		ug/L	
			Total Zinc (Zn)	2011/03/25	ND, RDL=5.0		ug/L	
		RPD	Total Iron (Fe)	2011/03/25	2.0		%	25
			Total Manganese (Mn)	2011/03/25	0.4		%	25

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
(1) Low level lab contamination. Minimal impact on data quality.

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Final Report: Marine Sediment Sampling Program, Glace Bay Small Craft Harbour, Cape Breton County, Nova Scotia

Report Prepared for:

Public Works and Government Services Canada

Job No. 121510391

May 3, 2010

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May 3, 2010
Job No. 121510391

Public Works and Government Services Canada
1713 Bedford Row
Halifax NS B3J 1T3

Attention: **Mr. Sean Wilson**

Dear Mr. Wilson:

Reference: **Final Report: Marine Sediment Sampling Program, Glace Bay Small Craft Harbour, Cape Breton County, Nova Scotia**

INTRODUCTION

Stantec Consulting Ltd. (Stantec) is pleased to provide Public Works and Government Services Canada (PWGSC) with the findings of a marine sediment sampling program (MSSP) undertaken at Glace Bay Small Craft Harbour in Cape Breton County, Nova Scotia. Glace Bay Harbour is currently scheduled for dredging that may include the disposal of marine sediments. The sampling program was undertaken to characterize the sediment chemistry in the dredge area and compare the results to a broad range of potentially applicable guidelines for agricultural, residential, parkland, commercial, and/or industrial lands where final disposal may occur.

BACKGROUND

The Department of Fisheries and Oceans Canada (DFO) through its Small Craft Harbours Branch (SCH) operates and maintains a national system of harbours that provide commercial fishers and recreational boaters with safe and accessible facilities. SCH must maintain these facilities to ensure adequate levels of service for harbour users.

SCOPE AND METHODOLOGY

The sediment sampling program was conducted on March 17, 2010 at Glace Bay Small Craft Harbour in Cape Breton County, Nova Scotia. A total of nine (9) sediment samples (Sample ID Nos. GB-A through GB-H and GB-HH) were collected from eight (8) locations by Canadian Standards Association and Diver Certification Board of Canada certified divers from Connors Diving Services Ltd. (Connors) from randomly selected locations within the footprint of the proposed project (refer to Figure 1 in **Attachment A**). A duplicate sample was collected for quality purposes; GB-HH is a duplicate sample of GB-H. The findings for samples GB-A through GB-H are discussed under the analytical results section and sample GB-HH is discussed under the QA/QC section in the context of quality. The divers placed the sample material in clean jars which were capped underwater. All samples were stored on ice in a cooler until the time of sample analysis.

Reference: Final Report: Marine Sediment Sampling Program, Glace Bay Small Craft Harbour, Cape Breton County, Nova Scotia

Sample locations were recorded using a global positioning system (GPS) receiver. The location coordinates of the sediment samples are provided in Table 1 as latitude and longitude in decimal degrees and in UTM (NAD 83 Zone 20) Easting and Northing in metres.

Table 1. Location of Sediment Samples collected at Glace Bay Small Craft Harbour, Cape Breton County, Nova Scotia.

Sample Location	Sample Station ID	Latitude	Longitude	UTM Easting	UTM Northing
Area of Proposed Harbour Improvements	GB-A	46.196100º	-59.950335º	735302.50	5120357.50
	GB-B	46.196717º	-59.949847º	735337.50	5120427.50
	GB-C	46.197019º	-59.949377º	735372.50	5120462.50
	GB-D	46.197322º	-59.948906º	735407.50	5120497.50
	GB-E	46.197939º	-59.948418º	735442.50	5120567.50
	GB-F	46.198241º	-59.947948º	735477.50	5120602.50
	GB-G	46.198858º	-59.947460º	735512.50	5120672.50
	GB-H	46.198750º	-59.947410º	735516.68	5120660.69

Connors delivered the samples to Maxxam Analytics Inc. (Maxxam), in Bedford, Nova Scotia, for select chemical analyses. Maxxam is an accredited laboratory with the Standards Council of Canada (SCC). SCC accredited laboratories are accredited to ISO 17025 standards. Laboratories accredited to ISO 17025 standards through the SCC are considered equivalent to the Canadian Association of Environmental Analytical Laboratories (CAEAL). Therefore, SCC certification provides equivalent accreditation to the same standard as CAEAL. Duplicate samples are archived at Maxxam for a retention period of 45 days, at which time they will be properly disposed of, unless otherwise instructed by PWGSC.

The sediment samples were analyzed in accordance with the land-based disposal suite of parameters as directed by PWGSC. Analysis included ICP 23 available metals scan plus tin, mercury, and hexavalent chromium, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPHs), and benzene, toluene, ethylbenzene, and xylenes (BTEX), polychlorinated biphenyls (PCBs) the DDT suite, total organic carbon (TOC), total inorganic carbon (TIC), and grain size distribution. BTEX and TPH were analyzed in accordance with Atlantic PIRI methodology (Partnership in RBCA (Risk-Based Corrective Action) Implementation).

As requested by PWGSC, analytical results were compared to the Canadian Council of Ministers of the Environment (CCME) – Canadian Soil Quality Guidelines (SQG) for the Protection of Environmental and Human Health, for agricultural, residential/parkland,and commercial/industrial land use; and the Atlantic Risk Based Corrective Action (RBCA) Version 2.1 Tier I Risk Based Screening Levels (RBSLs) for TPHs and BTEXs. For reporting purposes, the marine sediment analytical results were also compared to Environment Canada's *Canadian Environmental Protection Act* (*CEPA*) guidelines for ocean-based disposal of dredged marine sediments and the CCME Marine Sediment Probable Effects Levels (MPELs).

ANALYTICAL RESULTS OF SEDIMENT SAMPLES

The analytical results are summarized in Tables B-1 to B-5 in **Attachment B** for the sediment samples obtained at Glace Bay Small Craft Harbour during the MSSP. The complete set of analytical results, laboratory QA/QC, and Certificates of Analyses from Maxxam for all parameters tested are also provided in **Attachment C** for reference.

PAH Concentrations

Ecological Receptors/Pathways:

- Two PAHs exceeded the guideline for the protection of freshwater aquatic life, including:
    - Naphthalene (guideline 0.013 mg/kg; GB-A 0.096 mg/kg, GB-B 0.13 mg/kg, GB-C 0.095 mg/kg, GB-D 0.10 mg/kg, GB-E 0.20 mg/kg, GB-F 0.19 mg/kg, GB-G 0.041 mg/kg, and GB-H 0.052 mg/kg); and
    - Phenanthrene (guideline 0.046 mg/kg; GB-A 0.38 mg/kg, GB-B 0.46 mg/kg, GB-C 0.32 mg/kg, GB-D 0.32 mg/kg, GB-E 0.65 mg/kg, GB-F 1.0 mg/kg, GB-G 0.052 mg/kg, and GB-H 0.10 mg/kg).
- The CCME Marine PELs were exceeded for three PAHs including:
    - Anthracene (guideline 0.245 mg/kg; GB-E 0.32 mg/kg and GB-F 0.29 mg/kg);
    - Phenanthrene (guideline 0.544 mg/kg; GB-E 0.65mg/kg and GB-F 1.0 mg/kg); and
    - Fluorene (guideline 0.144 mg/kg; GB-F 0.15 mg/kg).

The total PAH concentration exceeded the *CEPA* Disposal at Sea Guidelines (guideline 2.5 mg/kg; GB-A 2.5 mg/kg, GB-E 2.8 mg/kg, and GB-F 3.8 mg/kg).

All other PAH concentrations meet CCME SQGs, CCME MPELs, and *CEPA* Disposal at Sea Guidelines for all ecological receptors/pathways.

Human Health Receptors/Pathways:

All PAH concentrations meet the CCME screening guidelines for the protection of human health with the exception of:

- Benzo(k)fluoranthene (guideline 0.034 mg/kg; GB-A 0.12 mg/kg, GB-B 0.082 mg/kg, GB-C 0.067 mg/kg, GB-D 0.091 mg/kg, GB-E 0.048 mg/kg, and GB-F 0.089 mg/kg); and
- The Index of Additive Cancer Risk (IACR) for protection of potable water was exceeded in several samples (guideline 1 mg/kg; GB-A 5.5 mg/kg, GB-B 3.6 mg/kg, GB-C 3.1 mg/kg, GB-D 4.4 mg/kg, GB-E 2.8 mg/kg, and GB-F 4.5 mg/kg).

Metal Concentrations

The sediment sample results in Table B-2 (**Attachment B**) were compared to the CCME SQGs for agricultural, residential/parkland, and commercial/industrial land use, as well as *CEPA* Disposal at Sea Guidelines and CCME MPELs. Concentrations of metals in the sediment samples were below all the applicable guidelines with the exception of:

- Arsenic concentrations exceeded the CCME agricultural (12 mg/kg), residential/parkland (12 mg/kg), and commercial/industrial (12 mg/kg) land use guidelines in samples GB-A (14 mg/kg) and GB-B (12 mg/kg);

- Hexavalent chromium concentrations exceeded the CCME agricultural (0.4 mg/kg) and residential/parkland (0.4 mg/kg) land use guidelines in sample GB-A (1.1 mg/kg); and

- Cadmium concentrations exceeded the *CEPA* Disposal at Sea Guideline (guideline 0.6 mg/kg; GB-A 0.7 mg/kg, GB-C 0.7 mg/kg, and GB-D 0.9 mg/kg).

The detection limit for hexavalent chromium was above the CCME agricultural and residential/parkland land use guidelines in samples GB-B, GB-C, and GB-D (detection limit of 0.8 mg/kg) due to the high amount of moisture of the samples.

Petroleum Hydrocarbons

Non-detectable levels of BTEX compounds were found in sample GB-C; BTEX compounds were detected in the remaining sediment samples and were compared to the Atlantic RBCA Tier I RBSLs and CCME SQGs for agricultural, residential/parkland, and commercial industrial land use guidelines for BTEX compounds (Table 3, **Attachment B**). The following exceedences were noted.

- Benzene concentrations exceeded the Atlantic RBCA Tier I RBSLs for:
  - Residential or commercial, potable land use with fine-grained soil (guideline 0.01 mg/kg) in samples GB-A (0.017 mg/kg), GB-D (0.029 mg/kg), and GB-G (0.012 mg/kg); and
  - Commercial, potable land use with fine and coarse-grained soils (guideline 0.03 mg/kg) in samples GB-B (0.036 mg/kg), GB-E (0.033 mg/kg), and GB-F (0.051 mg/kg).

- Benzene concentrations exceeded the CCME SQGs for:
  - Agricultural, residential/parkland and commercial/industrial land use, surface and subsoil fine soil (guideline 0.0068 mg/kg) in samples GB-A (0.017 mg/kg), GB-D (0.029 gm/kg), GB-G (0.012 mg/kg), and GB-H (0.009 mg/kg);
  - Agricultural, residential/parkland and commercial/industrial land use, surface and subsoil fine and coarse soil (guideline 0.030 mg/kg) in samples GB-B (0.036 mg/kg), GB-E (0.033 mg/kg), and GB-F (0.051 mg/kg).

- Toluene concentrations exceeded the Atlantic RBCA Tier I RBSLs for:
  - Residential or commercial, potable land use with fine-grained soil (guideline 0.08 mg/kg) in sample GB-F (0.11 mg/kg).

- Toluene concentrations exceeded the CCME SQG for:
  - Agricultural, residential/parkland and commercial/industrial land use, surface and subsurface fine soil (guideline 0.08 mg/kg) in sample GB-F (0.11 mg/kg).

The sediment samples were tested for modified TPH and compared to the established Atlantic RBCA Version 2.1 Tier I RBSLs for residential and commercial land use (Table B-3, **Attachment B**). All samples, with the exception of GB-G and GB-H, indicated detectable levels of modified TPH. Modified TPH in samples GB-A through GB-F were compared to the Diesel #2 RBSLs. All samples exceeded the RBSLs for residential, potable land uses, with coarse and fine-grained soil types, as well as residential, non-potable land uses with coarse-grained soils. There are no CCME SQGs established for TPH.

Sediment Grain Size

The analytical results shown in Table B-4, **Attachment B** for grain size distribution of sediment samples are summarized as follows:

- Location GB-A sediments were predominantly silt (65%) with lesser amounts of clay (20%) and sand (15%), and minor amounts of gravel (0.3%);
- Location GB-B sediments were predominantly silt (62%) with lesser amounts of clay (25%) and sand (13%);
- Location GB-C sediments were predominantly silt (53%) with lesser amounts of sand (23%) and clay (23%);
- Location GB-D sediments were predominantly silt (52%) with lesser amounts of sand (29%) and clay (19%);
- Location GB-E sediments were a mixture of silt (38%), clay (30%), and sand (29%);
- Location GB-F sediments were predominantly silt (57%) with lesser amounts of sand (24%) and clay (18%) and minor amounts of gravel (0.6%);
- Location GB-G sediments were predominantly sand (89%) with minor amounts of silt (7.6%) and clay (3.5%); and
- Location GB-H sediments were predominantly sand (87%) with minor amounts of silt (9.2%) and clay (3.5 %).

Carbon Analysis

As shown in Table B-4, **Attachment B**, total organic carbon content of the sediment samples ranged from 7.5 g/kg and 69 g/kg, while total inorganic carbon content ranged from 0.8 g/kg and 34 g/kg.

PCB Concentration

The analytical results for PCBs showed non-detectable levels of total PCBs in all samples and are therefore below CCME SQGs, *CEPA* Disposal at Sea Guidelines, and CCME MPELs.

Organochlorinated Pesticides

As shown in Table B-5, **Attachment B**, the analytical results for organochlorinated pesticides show non-detectable levels for all compounds analyzed and are therefore below CCME SQGs and CCME MPELs. Note that the elevated RDL for o,p-DDD + p,p-DDD and o,p-DDT +p,p-DDT were above the CCME MPELs in some samples.

QA/QC

Comparison of duplicate analysis for samples GB-H and GB-HH showed variation ranging from to 0% to 40% (16.4% average) for the PAH compounds analyzed.

Metals, BTEX/TPH, grain size, and organochlorinated pesticides compared very well with little variation in analytical results between GB-H and GB-HH (i.e., generally less than 20%).

SUMMARY

The analytical results for the sediment samples collected on March 17, 2010 from Glace Bay Small Craft Harbour in Cape Breton County, NS indicate the following:

- Two PAHs exceeded the CCME guidelines for the protection of freshwater aquatic life, including naphthalene (GB-A, GB-B, GB-C, GB-D, GB-E, GB-F, GB-G, and GB-H), and phenanthrene (GB-A, GB-B, GB-C, GB-D, GB-E, GB-F, GB-G, and GB-H);
- The CCME MPELs were exceeded by anthracene (GB-E and GB-F), phenanthrene (GB-D and GB-F), and fluorene (GB-F);
- The total PAH concentration exceeded the *CEPA* Disposal at Sea Guidelines in samples GB-A, GB-E, and GB-F;
- Benzo(k)fluoranthene exceeded the CCME SQGs for the protection Human Health, based on the protection of potable water (GB-A, GB-B, GB-C, GB-D, GB-E, and GB-F);
- Samples GB-A, GB-B, GB-C, GB-D, GB-E, and GB-F exceeded the Index of Additive Cancer Risk (IACR);

- Arsenic concentrations exceeded the CCME SQGs for agricultural, residential/parkland, and commercial/industrial land use in samples GB-A and GB-B;

- Hexavalent chromium concentrations exceeded the CCME SQGs for agricultural and residential/parkland land use in sample GB-A;

- Cadmium concentrations exceeded the *CEPA* Disposal at Sea Guideline in samples GB-A, GB-C, and GB-D;

- The detection limit for hexavalent chromium was above the CCME agricultural and residential/parkland land use guidelines in samples GB-B, GB-C, and GB-D;

- Benzene concentrations exceeded the Atlantic RBCA Tier I RBSLs for:
  - Residential or commercial, potable land use with fine-grained soil in samples GB-A, GB-D, and GB-G;
  - Commercial, potable land use with fine and coarse-grained soils in samples GB-B, GB-E, and GB-F;

- Benzene concentrations exceeded the CCME SQGs for:
  - Agricultural, residential/parkland and commercial/industrial land use, surface and subsoil fine soil in samples GB-A, GB-D, GB-G, and GB-H;
  - Agricultural, residential/parkland and commercial/industrial land use, surface and subsoil fine and coarse soil in samples GB-B, GB-E, and GB-F;

- Toluene concentrations exceeded the Atlantic RBCA Tier I RBSLs for:
  - Residential or commercial, potable land use with fine-grained soil in sample GB-F;

- Toluene concentrations exceeded the CCME SQG for:
  - Agricultural, residential/parkland and commercial/industrial land use, surface and subsurface fine soil in sample GB-F; and

- Modified TPH in samples GB-A through GB-F exceeded the RBSLs for residential, potable land uses, with coarse and fine-grained soil types, as well as residential, non-potable land uses with coarse-grained soils.

At locations GB-A through GB-H, the sediment was characterized as follows:

- Location GB-A sediments were predominantly silt (65%) with lesser amounts of clay (20%) and sand (15%), and minor amounts of gravel (0.3%);

- Location GB-B sediments were predominantly silt (62%) with lesser amounts of clay (25%) and sand (13%);

- Location GB-C sediments were predominantly silt (53%) with lesser amounts of sand (23%) and clay (23%);

- Location GB-D sediments were predominantly silt (52%) with lesser amounts of sand (29%) and clay (19%);
- Location GB-E sediments were a mixture of silt (38%), clay (30%), and sand (29%);
- Location GB-F sediments were predominantly silt (57%) with lesser amounts of sand (24%) and clay (18%) and minor amounts of gravel (0.6%);
- Location GB-G sediments were predominantly sand (89%) with minor amounts of silt (7.6%) and clay (3.5%); and
- Location GB-H sediments were predominantly sand (87%) with minor amounts of silt (9.2%) and clay (3.5 %).

Based on the above results, the sediment may not be suitable for ocean disposal on the basis of the sediment screening criteria for total PAHs, the exceedence of the CCME MPELs by several PAHs, and the exceedence of the *CEPA* Disposal at Sea Guidelines by cadmium. These exceedences would require regulatory consultation with Environment Canada to assess additional investigations that may be necessary and still possible to pursue this disposal option. The sediment may also not be suitable for land disposal in zones near potable water or in proximity to surface water (freshwater) sources and wetlands as a result of exceedence by several of the PAHs of the CCME Soil Quality Guidelines for the protection of freshwater life and human health. In addition, considering the exceedence of arsenic above the CCME Soil Quality Guidelines for the protection of environmental and human health, and the exceedence of benzene and toluene of the RBCA RBSLs and CCME SQGs, the material may not be suitable for disposal in agricultural, residential/parkland, or commercial/industrial land use applications. While arsenic exceeded the CCME SQGs, the high concentrations are likely attributed to the natural background concentrations in Nova Scotia. Further investigation (e.g., leachate testing) and consultation with regulators may be required to determine if approval can be obtained for ocean and/or land disposal options on the basis of exceedence by several chemical parameters.

CLOSING COMMENTS

This report has been prepared for the sole benefit of Public Works Government Services Canada (PWGSC). The report may not be used by any other person or entity without the express written consent of Stantec and PWGSC.

Any uses that a third party makes of this report, or any reliance on decisions made based on it, are the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made, or actions taken, based on this report.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. Conclusions and recommendations presented in this report should not be construed as legal advice.

Reference: **Final Report: Marine Sediment Sampling Program, Glace Bay Small Craft Harbour, Cape Breton County, Nova Scotia**

The conclusions presented in this report represent the best technical judgment of Stantec based on the data obtained from the work. The conclusions are based on the site conditions observed by Stantec at the time the work was performed at the specific testing and/or sampling locations, and can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on the site conditions, as well as the history of the site reflecting natural, construction and other activities. In addition, analyses have been carried out for a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec cannot warrant against undiscovered environmental liabilities.

We trust this letter contains all of the information required at this time and are available at your convenience should you have any questions.

Sincerely,

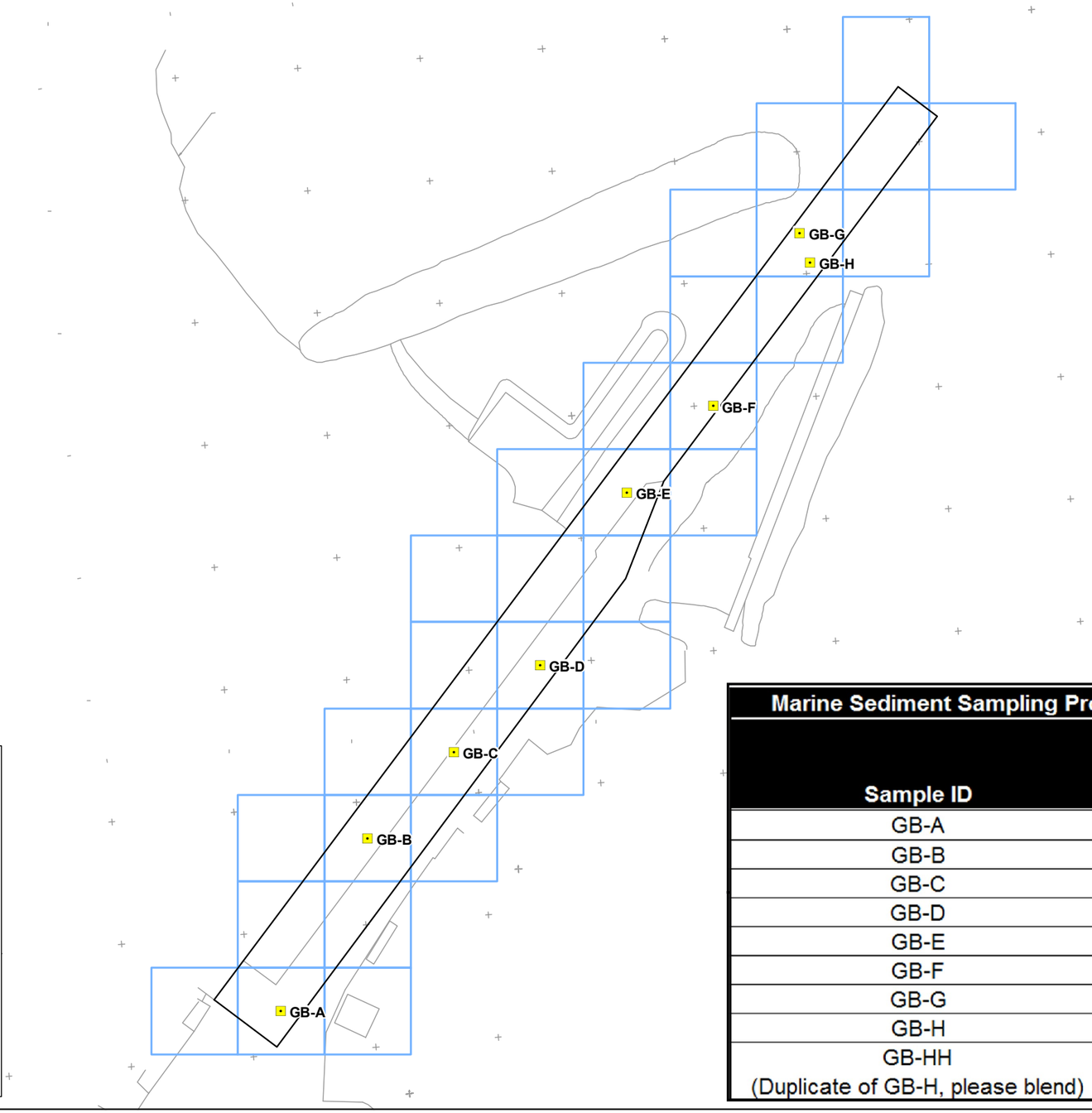
STANTEC CONSULTING LTD.

ORIGINAL SIGNED BY

Kelley Fraser, MES, CEPIT
Project Manager
Tel: (902) 468-7777
kelley.fraser@stantec.com

Attachments:
Attachment A Figure 1
Attachment B Analytical Tables
Attachment C Maxxam Laboratory Certificates

ATTACHMENT A
Figure 1



Legend

- Sampling Locations
- Sample Grid
- Dredge Area
- Base Data

Base Data Sourc
Glace Bay.dwg provided by PWGSC

Scale - 1 : 2,000

0 25 50

Meters

Marine Sediment Sampling Program, Glace Bay, Cape Breton County, NS, SCH 1114

Sample ID	Latitude (NAD83)	Longitude (NAD83)	UTM NAD83 Z20 Easting	UTM NAD83 Z20 Northing
GB-A	46.196100	-59.950335	735302.50	5120357.50
GB-B	46.196717	-59.949847	735337.50	5120427.50
GB-C	46.197019	-59.949377	735372.50	5120462.50
GB-D	46.197322	-59.948906	735407.50	5120497.50
GB-E	46.197939	-59.948418	735442.50	5120567.50
GB-F	46.198241	-59.947948	735477.50	5120602.50
GB-G	46.198858	-59.947460	735512.50	5120672.50
GB-H	46.198750	-59.947410	735516.68	5120660.69
GB-HH (Duplicate of GB-H, please blend)	46.198750	-59.947410	735516.68	5120660.69

DATE:
April 16, 2010

PREPARED BY:
G. Mesheau

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

Glace Bay, Cape Breton County, SCH 1114

MARINE SEDIMENT SAMPLING PROGRAM

FIGURE NO.:
Figure 1

Stantec

ATTACHMENT B
Analytical Tables

Stantec

Job No. 121510391

Table B1. PAH and PCB Analytical Results for Marine Sediment Samples - Glace Bay Small Craft Harbour, Cape Breton County, NS

Parameter	RDL[1]	Units	Sample Identification and Sampling Date									CCME Soil Quality Guidelines[2]								CCME Marine PELs	*CEPA* Disposal at Sea Guidelines[8]
			GB-A	GB-B	GB-C	GB-D	GB-E	GB-F	GB-G	GB-H	GB-HH	Agricultural	Residential/ Parkland	Commercial/ Industrial	Human Health Agr/ResPrk/Comm - Ind[3]	Environmental Health/Soil Contact Agri/ResPrk[4]	Environmental Health Comm/Ind[5]	Environmental Health Soil/Food Ingestion Agri / Res / Park[6]	Environmental Health Freshwater Life[7]		
			March 17, 2010																		
Non-Carcinogenic PAHs																					
1-Methylnaphthalene	0.005	mg/kg	0.084	0.096	0.086	0.088	0.11	0.12	0.031	0.035	0.052	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	0.005	mg/kg	0.12	0.14	0.12	0.14	0.16	0.18	0.041	0.050	0.075	-	-	-	-	-	-	-	-	0.201	-
Acenaphthene	0.005	mg/kg	0.024	0.037	0.038	0.027	0.064	0.079	<0.005	0.009	0.011	-	-	-	-	-	-	-	0.28	0.0889	-
Acenaphthylene	0.005	mg/kg	<0.005	<0.005	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005	-	-	-	-	-	-	21.5	320	0.128	-
Anthracene	0.005	mg/kg	0.12	0.15	0.14	0.14	0.32	0.29	0.017	0.041	0.029	-	-	-	-	2.5	32	61.5	-	0.245	-
Fluoranthene	0.005	mg/kg	0.45	0.37	0.34	0.37	0.45	0.68	0.046	0.067	0.071	-	-	-	-	50	180	15.4	-	1.494	-
Fluorene	0.005	mg/kg	0.043	0.060	0.069	0.048	0.10	0.15	0.011	0.015	0.019	-	-	-	-	-	-	15.4	0.25	0.144	-
Naphthalene	0.005	mg/kg	**0.096**	**0.13**	**0.095**	**0.10**	**0.20**	**0.19**	**0.041**	**0.052**	**0.069**	-	-	-	-	-	-	8.8	0.013	0.391	-
Perylene	0.005	mg/kg	0.041	0.028	0.023	0.038	0.027	0.032	<0.005	<0.005	<0.005	-	-	-	-	-	-	-	-	-	-
Phenanthrene	0.005	mg/kg	**0.38**	**0.46**	**0.32**	**0.32**	**0.65**	**1.0**	**0.052**	**0.10**	**0.10**	-	-	-	-	-	-	43.0	0.046	0.544	-
Pyrene	0.005	mg/kg	0.34	0.27	0.25	0.27	0.32	0.48	0.036	0.053	0.058	-	-	-	-	-	-	7.7	-	1.398	-
Carcinogenic PAHs																					
Benzo(a)anthracene	0.005	mg/kg	0.19	0.13	0.13	0.15	0.16	0.23	0.015	0.025	0.028	-	-	-	0.33	-	-	6.2	-	0.693	-
Benzo(a)pyrene	0.005	mg/kg	0.14	0.089	0.085	0.12	0.11	0.14	0.013	0.021	0.018	-	-	-	0.37	20	72	0.6	8,800	0.763	-
Benzo(b)fluoranthene	0.005	mg/kg	0.11	0.060	0.055	0.11	0.082	0.082	0.009	0.017	0.015	-	-	-	0.16	-	-	6.2	-	-	-
Benzo(g,h,i)perylene	0.005	mg/kg	0.11	0.068	0.066	0.092	0.058	0.079	0.013	0.019	0.018	-	-	-	6.8	-	-	-	-	-	-
Benzo(k)fluoranthene	0.005	mg/kg	**0.12**	**0.082**	**0.067**	**0.091**	**0.048**	**0.089**	0.010	0.010	0.014	-	-	-	0.034	-	-	6.2	-	-	-
Chrysene	0.005	mg/kg	0.22	0.15	0.13	0.19	0.16	0.24	0.023	0.031	0.034	-	-	-	2.1	-	-	6.2	-	0.846	-
Dibenz(a,h)anthracene	0.005	mg/kg	0.031	0.019	0.018	0.026	<0.005	0.029	<0.005	<0.005	<0.005	-	-	-	0.23	-	-	-	-	0.135	-
Indeno(1,2,3-cd)pyrene	0.005	mg/kg	0.091	0.050	0.048	0.073	0.047	0.064	0.008	0.014	0.011	-	-	-	2.7	-	-	-	-	-	-
B[a]P TPE ILCR[9]	-	mg/kg	0.68 [10]	0.43 [10]	0.40 [10]	0.57 [10]	0.45 [10]	0.66 [10]	0.020	0.031	0.083 [10]	-	-	-	5.3	-	-	-	-	-	-
IACR[11]	-	mg/kg	*5.5*	*3.6*	*3.1*	*4.4*	*2.8*	*4.5*	0.50	0.60	0.70	-	-	-	1.0	-	-	-	-	-	-
Total PAHs[12]	-	mg/kg	2.5	2.1	1.9	2.1	2.8	3.8	0.30	0.48	0.50	-	-	-	-	-	-	-	-	-	2.5
Polychlorinated Biphenyl Results																					
PCB concentration	0.03	mg/kg	<0.08	<0.08	<0.08	<0.3	<0.1	<0.08	<0.03	<0.03	<0.03	0.5	1.5	33	-	-	-	-	-	0.189	0.1

[1] RDL = Reportable Detection Limit

[2] Canadian Council of Ministers of the Environment Soil Quality Guidelines, updated 2008

[3] Soil Quality Guidelines for Human Health. All these guidelines are based on the protection of potable water, with the exception of B[a]P TPE (see note 9).

[4] Soil Quality Guideline for Environmental Health and Soil Contact for Agricultural (Agri), Residential (Res) and Parkland (Prk) sites.

[5] Soil Quality Guideline for Environmental Health for Commercial (Comm) and Industrial (Ind) sites.

[6] Soil Quality Guideline for Environmental Health for soil and food ingestion by livestock and wildlife.

[7] Soil Quality Guideline for the Protection of Freshwater Aquatic Life.

[8] *Canadian Environmental Protection Act* Disposal at Sea sediment screening guidelines.

[9] B[a]P TPE = Benzo[a]pyrene Total Potency Equivalents Guideline based on 10^{-5} Incremental Lifetime Cancer Risk

[10] B[a]P TPE multiplied by uncertainty factor (UF) of 3 to account for carcinogenic potential of alkylated and other PAHs present as per 2008 CCME Guidelines for PAHs

[11] IACR = Index of additive cancer risk

[12] Total PAHs does not include 1-Methylnaphthalene, 2-Methylnaphthalene, or Perylene.

Bold numbers indicate exceedence of one or more CCME SQGs.

Borded cells indicate exceedece of CCME MPELs

Ialics indicate exceedence of IACR guideline

Underlined numbers indicate exceedence of *CEPA* Disposal at Sea Guidelines

Stantec

Job No. 121510391

Table B-2. Metal Concentrations in Marine Sediment Samples Collected at Glace Bay Small Craft Harbour, Cape Breton County, NS

Parameter	RDL[1]	Units	Sediment Sample Identication and Date									CCME Soil Quality Guidelines[2]			CCME Marine Probable Effects Levels[3]	*CEPA* Disposal at Sea Guidelines[4]
			GB-A	GB-B	GB-C	GB-D	GB-E	GB-F	GB-G	GB-H	GB-HH	Agricultural	Residential/ Parkland	Commercial/ Industrial		
			March 17, 2010													
Chromium VI (Hexavalent Cr)	0.2	mg/kg	*1.1*	<0.8 **	<0.8 **	<0.8 **	<0.2	<0.4	<0.2	<0.2	<0.2	0.4	0.4	1.4	-	-
Mercury (Hg)	0.01	mg/kg	0.04	0.02	0.03	0.03	0.02	0.02	0.02	0.01	0.01	6.6	6.6	24 | 50	0.70	0.75
Available Aluminum (Al)	10	mg/kg	11,000	11,000	9,800	9,700	8,100	7,900	6,000	6,200	6,200	-	-	-	-	-
Available Antimony (Sb)	2	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2	20	20	40	-	-
Available Arsenic (As)	2	mg/kg	*14*	*12*	9	9	11	9	11	10	10	12	12	12	41.6	-
Available Barium (Ba)	5	mg/kg	94	110	70	63	68	73	38	43	43	750	500	2,000	-	-
Available Beryllium (Be)	2	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2	4	4	8	-	-
Available Bismuth (Bi)	2	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2	-	-	-	-	-
Available Boron (B)	5	mg/kg	34	29	24	34	38	38	8	6	6	*2	-	-	-	-
Available Cadmium (Cd)	0.3	mg/kg	**0.7**	0.5	**0.7**	**0.9**	0.4	<0.3	<0.3	<0.3	<0.3	1.4	10	22	4.2	0.6
Available Chromium (Cr)	2	mg/kg	22	22	21	20	20	20	11	11	11	64	64	87	160	-
Available Cobalt (Co)	1	mg/kg	11	12	12	11	9	10	7	7	7	40	50	300	-	-
Available Copper (Cu)	2	mg/kg	43	31	39	38	22	24	18	17	14	63	63	91	108	-
Available Iron (Fe)	50	mg/kg	28,000	29,000	26,000	27,000	24,000	24,000	24,000	23,000	24,000	-	-	-	-	-
Available Lead (Pb)	0.5	mg/kg	34	21	20	21	16	16	10	10	11	70	140	260 | 600	112	-
Available Lithium (Li)	2	mg/kg	22	22	20	20	16	17	12	12	12	-	-	-	-	-
Available Manganese (Mn)	2	mg/kg	530	580	490	500	500	510	720	660	660	-	-	-	-	-
Available Molybdenum (Mo)	2	mg/kg	2	3	*9*	*6*	3	3	<2	<2	<2	5	10	40	-	-
Available Nickel (Ni)	2	mg/kg	27	29	28	26	24	24	14	15	15	50	50	50	-	-
Available Rubidium (Rb)	2	mg/kg	11	12	10	10	9	9	4	5	5	-	-	-	-	-
Available Selenium (Se)	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	1	2.9	-	-
Available Silver (Ag)	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	20	20	40	-	-
Available Strontium (Sr)	5	mg/kg	46	53	41	51	100	77	62	52	57	-	-	-	-	-
Available Thallium (Tl)	0.1	mg/kg	0.3	0.2	0.3	0.3	0.1	0.1	<0.1	<0.1	<0.1	1	1	1	-	-
Available Tin (Sn)	2	mg/kg	4	2	2	3	2	2	<2	4	3	5	50	300	-	-
Available Uranium (U)	0.1	mg/kg	0.8	0.8	1.7	1.5	0.7	0.6	0.3	0.4	0.4	23	23	33 | 300	-	-
Available Vanadium (V)	2	mg/kg	31	30	29	28	22	23	15	16	16	130	130	130	-	-
Available Zinc (Zn)	5	mg/kg	110	88	98	110	66	65	52	56	47	200	200	360	271	-

* Guideline is for hot water soluable and not applicable

** RDL is elevated above CCME guidelines

[1] RDL = Reportable Detection Limit

[2] Canadian Environmental Quality Guidelines, updated 2007

[3] Canadian Council of Ministers of the Environment Canadian Soil Quality Guidelines for the Protection of Aquatic Life Marine Probable Effects Levels 2002

[4] *Canadian Environmental Protection Act* Disposal at Sea sediment screening guidelines, updated 2007

Italicized numbers indicate exceedence of CCME SQGs for agricultural land use

Underlined numbers indicate exceedence of CCME SQGs for residential/parkland land use

Outlined cells indicate exceedence of CCME SQGs for commerical/industrial land use

Bold numbers indicate exceedence of *CEPA* Disposal at Sea Guidelines

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Job No. 121510391

Table B-3. BTEX/TPH Concentrations in Marine Sediment Samples Collected at Glace Bay Small Craft Harbour, Cape Breton County, NS

Results Table for BTEX Compounds (mg/kg)

Sample ID	Date	BTEX Compounds (mg/kg)				Individual TPH Carbon Segments (mg/kg)			
		Benzene	Toluene	Ethylbenzene	Xylenes	C6-C10	>C10-C21	>C21-C32	Modified TPH[a]
GB-A	March 17, 2007	0.017	<0.03	<0.01	<0.05	<3	86	330	420
GB-B		0.036	<0.03	<0.01	<0.05	<3	130	450	570
GB-C		<0.003	<0.03	<0.01	<0.05	<3	79	240	320
GB-D		0.029	<0.03	<0.01	<0.05	<3	85	360	450
GB-E		0.033	<0.03	<0.01	<0.05	<3	250	310	560
GB-F		0.051	0.11	<0.01	<0.05	<3	87	170	260
GB-G		0.012	<0.03	<0.01	<0.05	<3	<15	<15	<20
GB-H		0.009	<0.03	<0.01	<0.05	<3	<15	<15	<20
GB-HH		0.007	<0.03	<0.01	<0.05	<3	<15	27	27
Detection Limits (Maxxam)		0.003	0.03	0.01	0.05	3	15	15	20

Atlantic RBCA Version 2.1 and CCME Guidelines for Comparison with the Above Analytical Results									
Atlantic RBCA Tier I RBSLs for Soil [b]			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Modified TPH		
							Gasoline	Diesel (#2)	Oil[a] (#6)
Residential	Potable	Coarse-grained	0.03	0.38	0.08	11	39	140	690
		Fine-grained	0.01	0.08	0.02	2.3	140	220	970
	Non-Potable	Coarse-grained	0.16	14	58	17	39	140	690
		Fine-grained	1.5	120	430	160	330	4,400	8,300
Commercial	Potable	Coarse-grained	0.03	0.38	0.08	11	450	7,400	10,000
		Fine-grained	0.01	0.08	0.02	2.3	520	840	4,700
	Non-Potable	Coarse-grained	1.8	160	430	200	450	7,400	10,000
		Fine-grained	11	680	430	650	10,000	7,700	10,000
CCME Soil Quality Guidelines[c]									
Agricultural Land Use	Surface	Coarse Soil	0.030[d]; 0.0095[e]	0.37	0.082	11	-	-	-
		Fine Soil	0.0068[d,e]	0.08	0.018	2.4	-	-	-
	Subsoil	Coarse Soil	0.030[d]; 0.011[e]	0.37	0.082	11	-	-	-
		Fine Soil	0.0068[d,e]	0.08	0.018	2.4	-	-	-
Residential/ Parkland Land Use	Surface	Coarse Soil	0.030[d]; 0.0095[e]	0.37	0.082	11	-	-	-
		Fine Soil	0.0068[d,e]	0.08	0.018	2.4	-	-	-
	Subsoil	Coarse Soil	0.030[d]; 0.011[e]	0.37	0.082	11	-	-	-
		Fine Soil	0.0068[d,e]	0.08	0.018	2.4	-	-	-
Commercial/ Industrial Land Use	Surface	Coarse Soil	0.030[d,e]	0.37	0.082	11	-	-	-
		Fine Soil	0.0068[d,e]	0.08	0.018	2.4	-	-	-
	Subsoil	Coarse Soil	0.030[d,e]	0.37	0.082	11	-	-	-
		Fine Soil	0.0068[d,e]	0.08	0.018	2.4	-	-	-

[a]Modified TPH values reflect the sum of the individual carbon fractions that resemble Gasoline, Diesel (#2) & Oil (#6) fraction

[b]Atlantic RBCA Version 2.1 Reference Document for Petroleum Impacted Sites (2003).

[c]A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines Report CCME-EPC-101E, Mar 1997 with updates to 2007

[d]10^{-5} Incremental Risk

[e]10^{-6} Incremental Risk

RBSL = Risk Based Screening Level; "-" denotes no guideline available.

Job No. 121510391

Table B-4. TOC, TIC, and Grain Size Analytical Results for Marine Sediment Samples Collected at Glace Bay Small Craft Harbour, Cape Breton County, NS

Parameter	RDL	Units	Sample Identification and Date								
			GB-A	GB-B	GB-C	GB-D	GB-E	GB-F	GB-G	GB-H	GB-HH
			March 17, 2010								
Grain Size Results											
< PHI -4 (16 mm)	0.1	%	100	100	100	100	100	100	100	100	100
< PHI -3 (8 mm)	0.1	%	100	100	100	100	100	100	100	100	100
< PHI -2 (4 mm)	0.1	%	100	100	100	100	100	100	100	100	100
< PHI -1 (2 mm)	0.1	%	100	100	100	100	97	99	100	100	100
< PHI 0 (1 mm)	0.1	%	98	97	99	98	93	97	100	100	100
< PHI +1 (1/2 mm)	0.1	%	95	94	97	95	87	93	99	99	100
< PHI +2 (1/4 mm)	0.1	%	92	92	92	89	82	88	83	88	90
< PHI +3 (1/8 mm)	0.1	%	89	90	87	82	78	83	44	57	58
< PHI +4 (1/16 mm)	0.1	%	85	87	77	71	68	75	11	13	8.9
< PHI +5 (1/32mm)	0.1	%	77	79	68	64	56	58	7.9	7.6	5.4
< PHI +6 (1/64 mm)	0.1	%	53	61	54	43	46	40	4.9	5.2	3.0
< PHI +7 (1/128 mm)	0.1	%	26	32	30	24	34	21	3.7	3.9	2.3
< PHI +8 (1/256 mm)	0.1	%	20	25	23	19	30	18	3.5	3.5	2.3
< PHI +9 (1/512 mm)	0.1	%	14	16	16	14	26	14	2.9	3.1	2.1
Gravel	0.1	%	0.3	<0.1	<0.1	<0.1	2.6	0.6	<0.1	<0.1	<0.1
Sand	0.1	%	15	13	23	29	29	24	89	87	91
Silt	0.1	%	65	62	53	52	38	57	7.6	9.2	6.6
Clay	0.1	%	20	25	23	19	30	18	3.5	3.5	2.3
Other											
Total Organic Carbon (TOC)	0.2	g/kg	39	35	62	63	69	59	11	7.5	14
Total Inorganic Carbon (TIC)	0.2	g/kg	6.8	34	0.8	11	15	5	5.4	6.6	14
Moisture	1	%	56	61	59	56	74	53	26	28	25

RDL = Reportable Detection Limit

Job No. 121510391

Table B-5. Organochlorinated Pesticide Concentrations in Marine Sediment Samples Collected at Glace Bay Small Craft Habour, Cape Breton County, NS

Parameter	Unit	RDL	GB-A	GB-B	GB-C	GB-D	GB-E	GB-F	GB-G	GB-H	GB-HH	CCME Soil Quality Guidelines[1]			CCME Marine Probable Effects Levels[2]	*CEPA* Disposal at Sea Guidelines[3]
			March 17, 2010									Agricultural	Residential / Parkland	Commercial / Industrial		
Pesticides and Herbicides																
Aroclor 1262	µg/g	0.02	<0.04	<0.04	<0.04	<0.2	<0.06	<0.04	<0.02	<0.02	<0.02	-	-	-	-	-
Aroclor 1268	µg/g	0.02	<0.04	<0.04	<0.04	<0.2	<0.06	<0.04	<0.02	<0.02	<0.02	-	-	-	-	-
o,p-DDD	µg/g	0.002	<0.005	<0.005	<0.005	<0.02	<0.008	<0.005	<0.002	<0.002	<0.002	-	-	-	-	-
p,p-DDD	µg/g	0.002	<0.005	<0.005	<0.005	<0.02	<0.008	<0.005	<0.002	<0.002	<0.002	-	-	-	-	-
o,p-DDD +p,p-DDD	µg/g	0.002	<0.005	<0.005	<0.005	<0.02	<0.008**	<0.005	<0.002	<0.002	<0.002	-	-	-	0.00781	-
o,p-DDE	µg/g	0.002	<0.005	<0.005	<0.005	<0.02	<0.008	<0.005	<0.002	<0.002	<0.002	-	-	-	-	-
p,p-DDE	µg/g	0.002	<0.005	<0.005	<0.005	<0.02	<0.008	<0.005	<0.002	<0.002	<0.002	-	-	-	-	-
o,p-DDE + p,p-DDE	µg/g	0.002	<0.005	<0.005	<0.005	<0.02	<0.008	<0.005	<0.002	<0.002	<0.002	-	-	-	0.374	-
o,p-DDT	µg/g	0.002	<0.005	<0.005	<0.005	<0.02	<0.008	<0.005	<0.002	<0.002	<0.002	-	-	-	-	-
p,p-DDT	µg/g	0.002	<0.005	<0.005	<0.005	<0.02	<0.008	<0.005	<0.002	<0.002	<0.002	-	-	-	-	-
o,p-DDT + p,p-DDT	µg/g	0.002	<0.005**	<0.005**	<0.005**	<0.02	<0.008**	<0.005**	<0.002	<0.002	<0.002	-	-	-	0.00477	-
DDT + Metabolites	µg/g	0.002	<0.005	<0.005	<0.005	<0.02	<0.008	<0.005	<0.002	<0.002	<0.002	0.7*	7*	12*	-	
Aroclor 1016	µg/g	0.02	<0.04	<0.04	<0.04	<0.2	<0.06	<0.04	<0.02	<0.02	<0.02	-	-	-	-	-
Aroclor 1221	µg/g	0.03	<0.08	<0.08	<0.08	<0.3	<0.1	<0.08	<0.03	<0.03	<0.03	-	-	-	-	-
Aroclor 1232	µg/g	0.02	<0.04	<0.04	<0.04	<0.2	<0.06	<0.04	<0.02	<0.02	<0.02	-	-	-	-	-
Aroclor 1242	µg/g	0.02	<0.04	<0.04	<0.04	<0.2	<0.06	<0.04	<0.02	<0.02	<0.02	-	-	-	-	-
Aroclor 1248	µg/g	0.02	<0.04	<0.04	<0.04	<0.2	<0.06	<0.04	<0.02	<0.02	<0.02	-	-	-	-	-
Aroclor 1254	µg/g	0.02	<0.04	<0.04	<0.04	<0.2	<0.06	<0.04	<0.02	<0.02	<0.02	-	-	-	0.709	-
Aroclor 1260	µg/g	0.02	<0.04	<0.04	<0.04	<0.2	<0.06	<0.04	<0.02	<0.02	<0.02	-	-	-	-	-

Notes:
RDL = Reportable Detection Limit
"-" = no applicable guideline
* = CCME Guideline for total DDT
** = Elevated RDL is above CCME MPELs
[1]Canadian Environmental Quality Guidelines, updated 2007
[2]Canadian Council of Ministers of the Environment Canadian Soil Quality Guidelines for the Protection of Aquatic Life Marine Probable Effects Levels 2002
[3]*Canadian Environmental Protection Act* Disposal at Sea sediment screening guidelines, updated 2007

ATTACHMENT C
Maxxam Laboratory Certificates

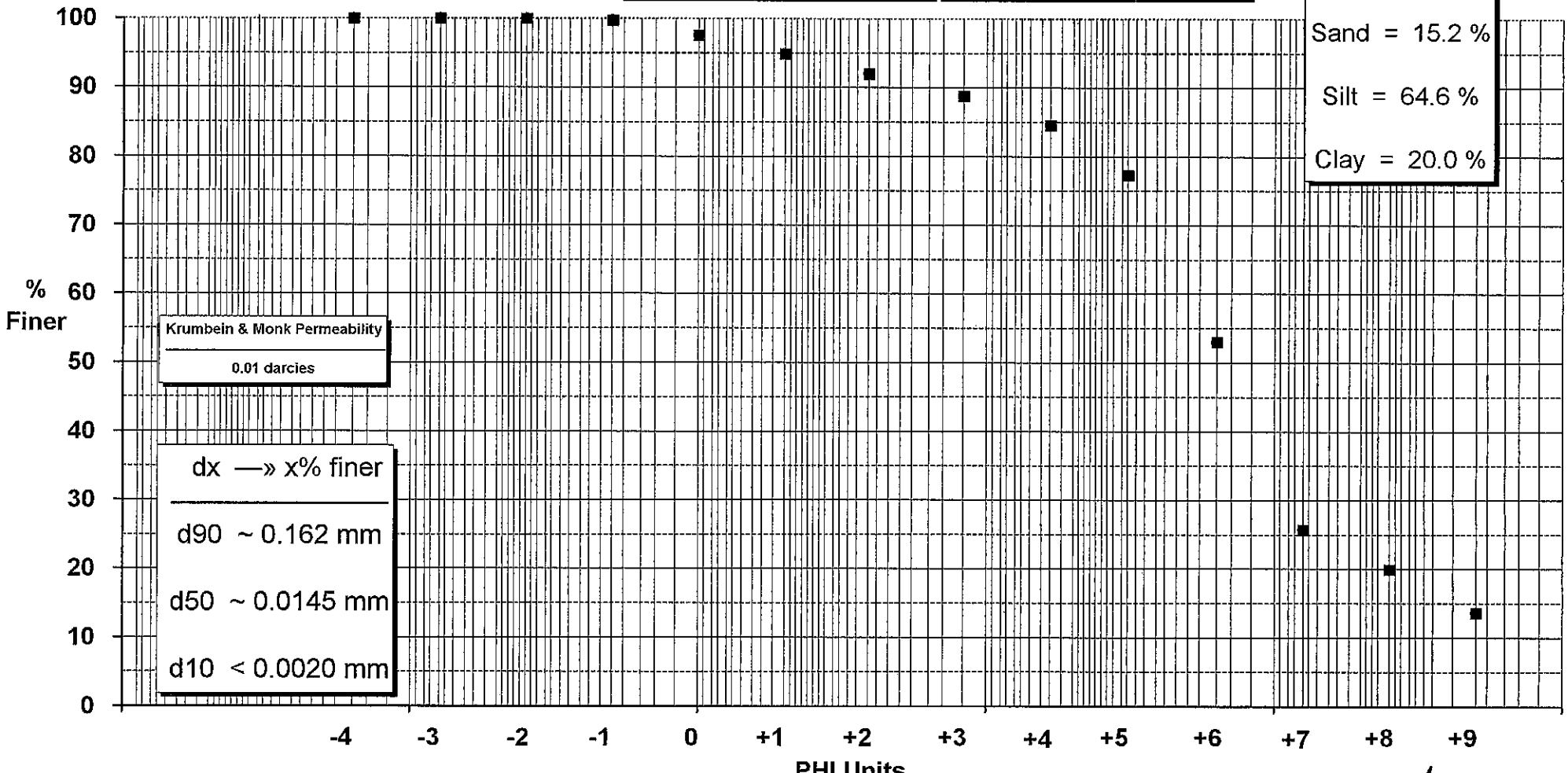
Maxxam Analytics

Maxxam ID: FI9627-01

GB-A

Percent Coarser than 75 µm (PHI = 3.737)	Percent Coarser than 50 µm (PHI = 4.322)
14.3 %	17.8 %

Wentworth	
Gravel	0.3 %
Sand	15.2 %
Silt	64.6 %
Clay	20.0 %



Krumbein & Monk Permeability
0.01 darcies

dx —» x% finer
d90 ~ 0.162 mm
d50 ~ 0.0145 mm
d10 < 0.0020 mm

Approved

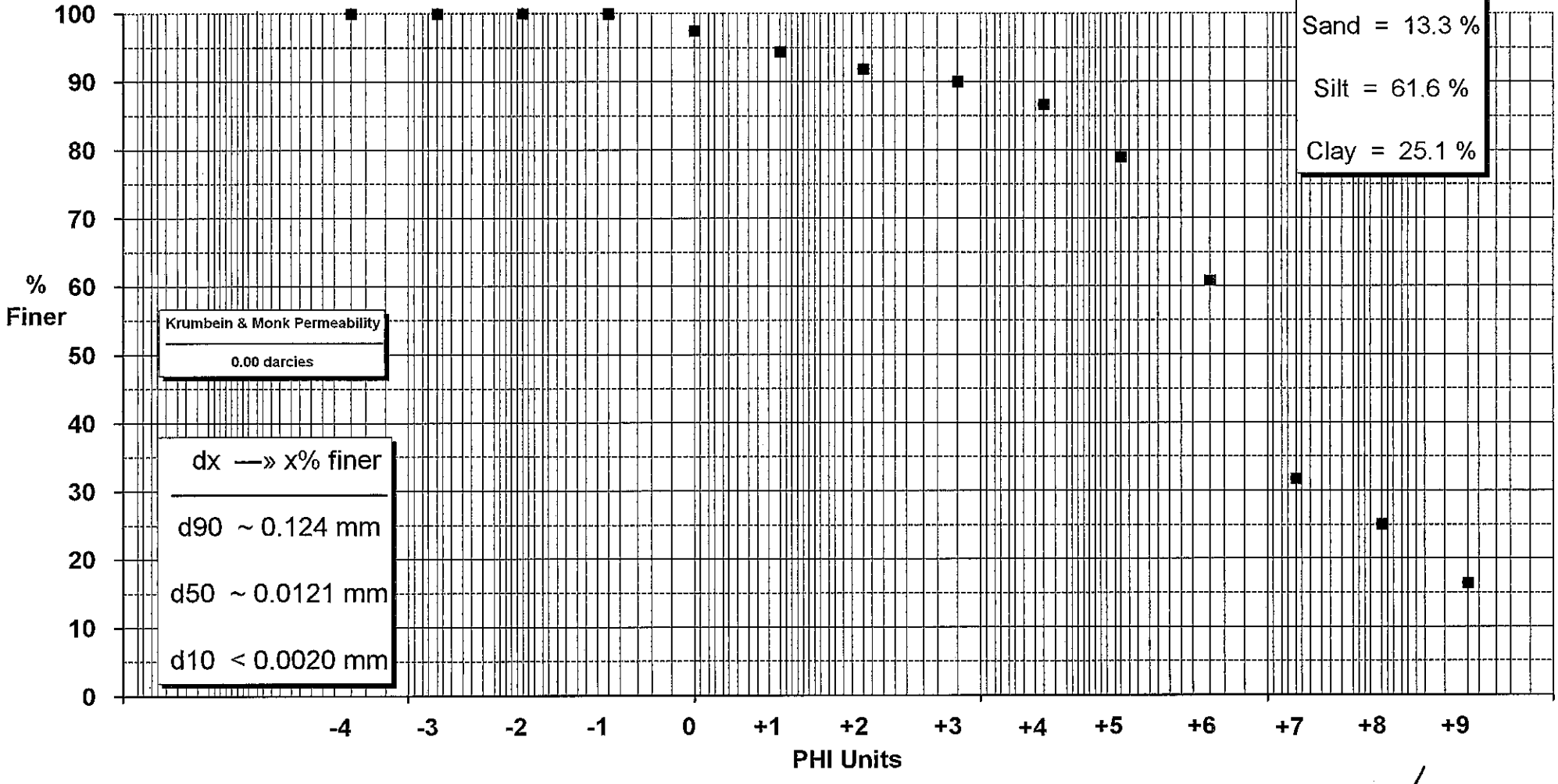
Maxxam Analytics

Maxxam ID: FI9629-01

GB-B

Percent Coarser than 75 µm (PHI = 3.737)	Percent Coarser than 50 µm (PHI = 4.322)
12.4 %	15.8 %

Wentworth	
Gravel	0.0 %
Sand	13.3 %
Silt	61.6 %
Clay	25.1 %



Krumbein & Monk Permeability
0.00 darcies

dx —» x% finer
d90 ~ 0.124 mm
d50 ~ 0.0121 mm
d10 < 0.0020 mm

Approved

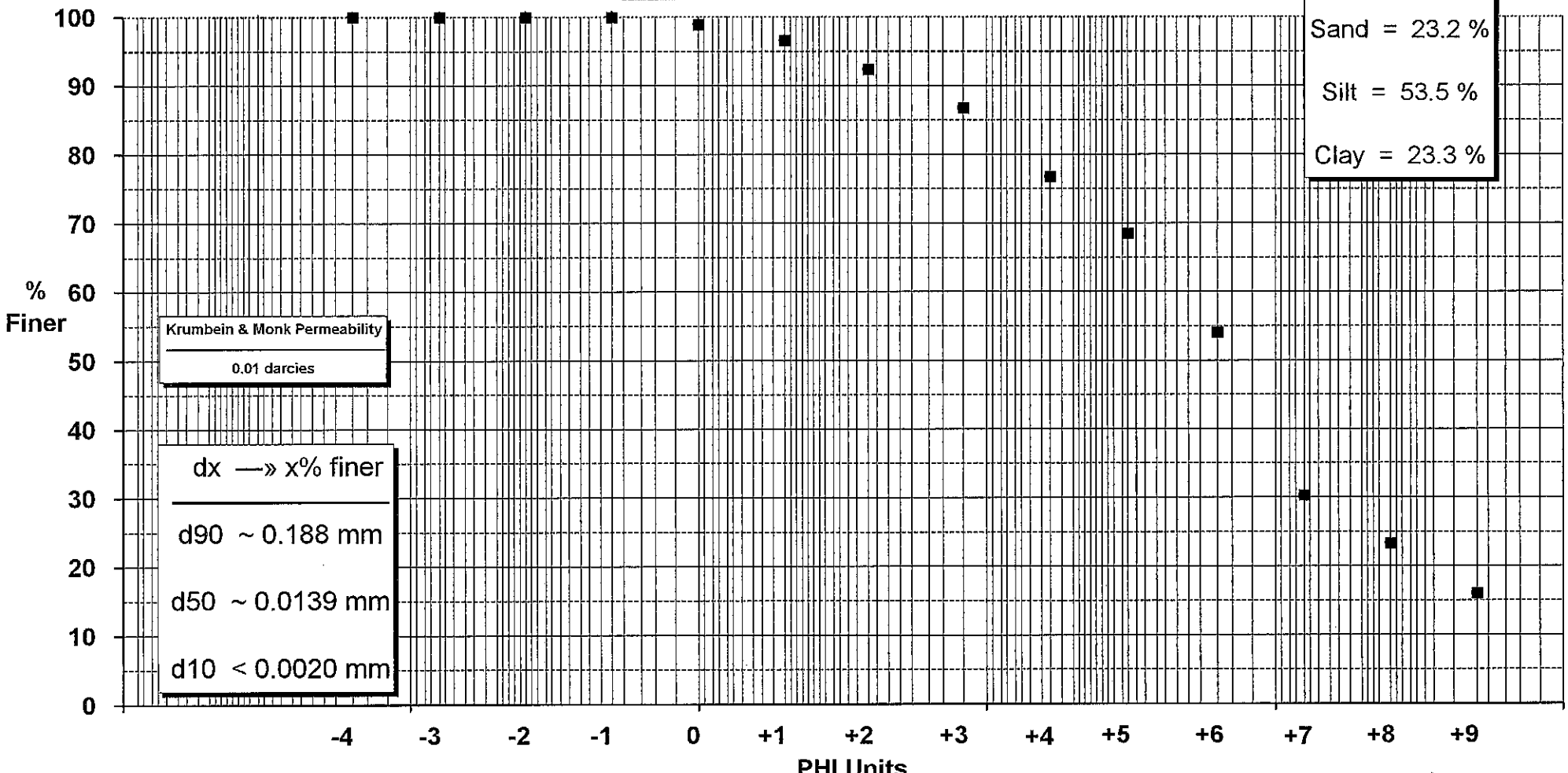
Maxxam Analytics

Maxxam ID: FI9630-01

GB-C

Percent Coarser than 75 µm (PHI = 3.737)	Percent Coarser than 50 µm (PHI = 4.322)
20.6 %	25.9 %

Wentworth	
Gravel	0.0 %
Sand	23.2 %
Silt	53.5 %
Clay	23.3 %



Krumbein & Monk Permeability
0.01 darcies

dx —» x% finer	
d90	~ 0.188 mm
d50	~ 0.0139 mm
d10	< 0.0020 mm

Approved

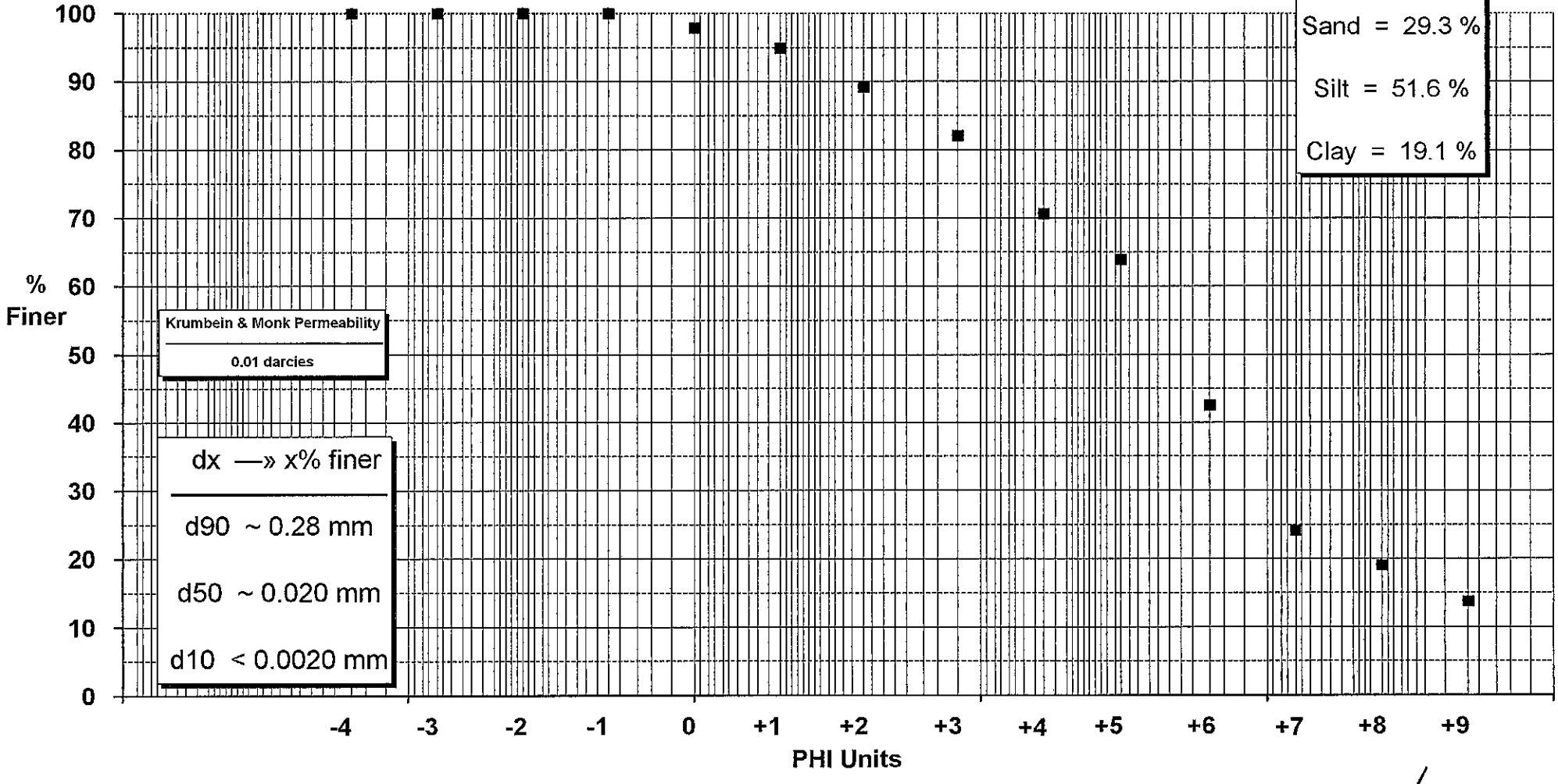
Maxxam Analytics

Maxxam ID: FI9631-01

GB-D

Percent Coarser than 75 µm (PHI = 3.737)	Percent Coarser than 50 µm (PHI = 4.322)
26.3 %	31.5 %

Wentworth	
Gravel	0.0 %
Sand	29.3 %
Silt	51.6 %
Clay	19.1 %



Krumbein & Monk Permeability
0.01 darcies

dx —» x% finer
d90 ~ 0.28 mm
d50 ~ 0.020 mm
d10 < 0.0020 mm

Approved

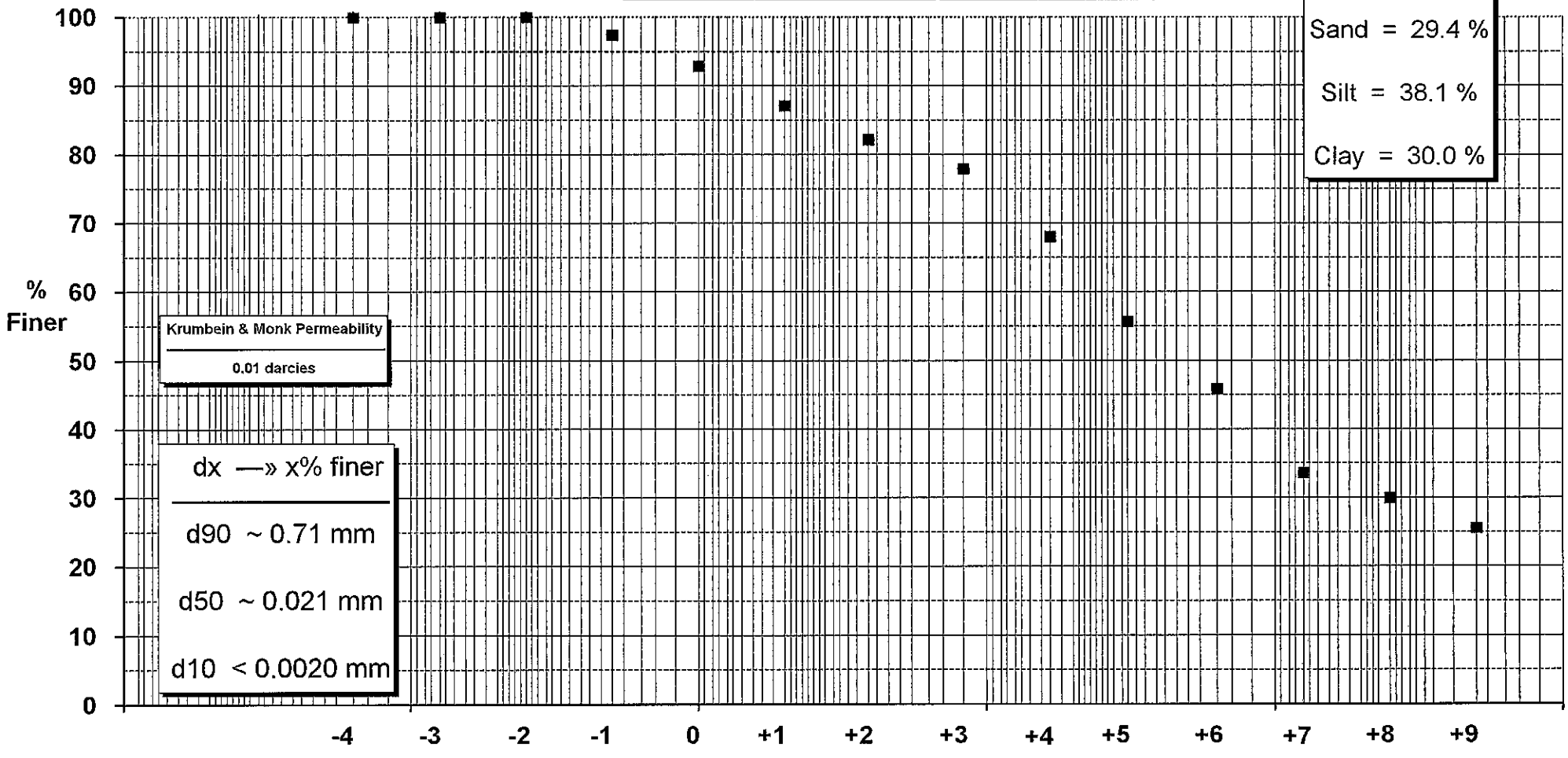
Maxxam Analytics

Maxxam ID: FI9632-01

GB-E

Percent Coarser than 75 µm (PHI = 3.737)	Percent Coarser than 50 µm (PHI = 4.322)
29.4 %	35.9 %

Wentworth
Gravel = 2.6 %
Sand = 29.4 %
Silt = 38.1 %
Clay = 30.0 %



Krumbein & Monk Permeability
0.01 darcies

dx —» x% finer
d90 ~ 0.71 mm
d50 ~ 0.021 mm
d10 < 0.0020 mm

Approved

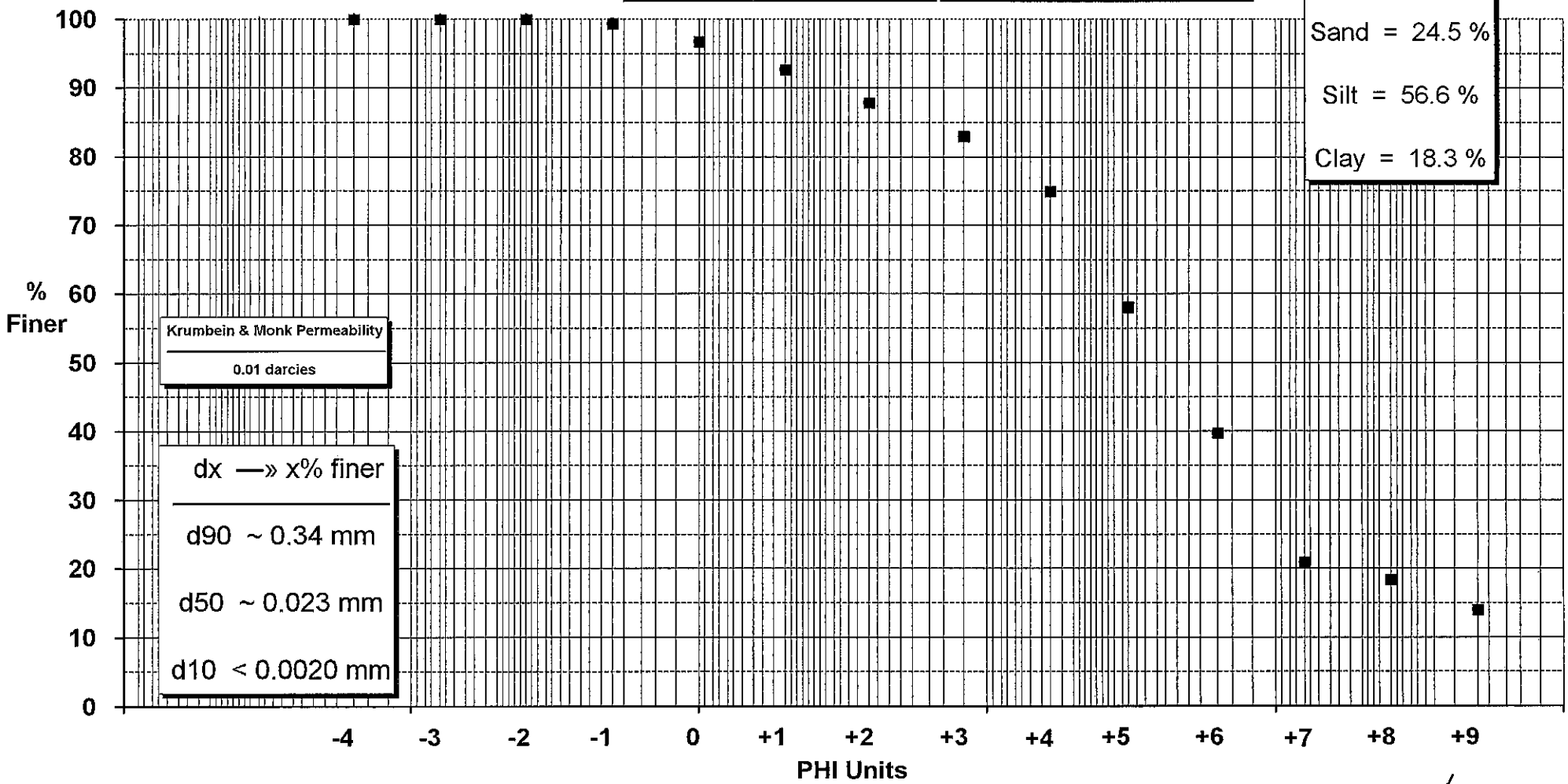
Maxxam Analytics

Maxxam ID: FI9633-01

GB-F

Percent Coarser than 75 µm (PHI = 3.737)	Percent Coarser than 50 µm (PHI = 4.322)
23.0 %	30.5 %

Wentworth	
Gravel	0.6 %
Sand	24.5 %
Silt	56.6 %
Clay	18.3 %



Krumbein & Monk Permeability
0.01 darcies

dx —» x% finer
d90 ~ 0.34 mm
d50 ~ 0.023 mm
d10 < 0.0020 mm

Approved

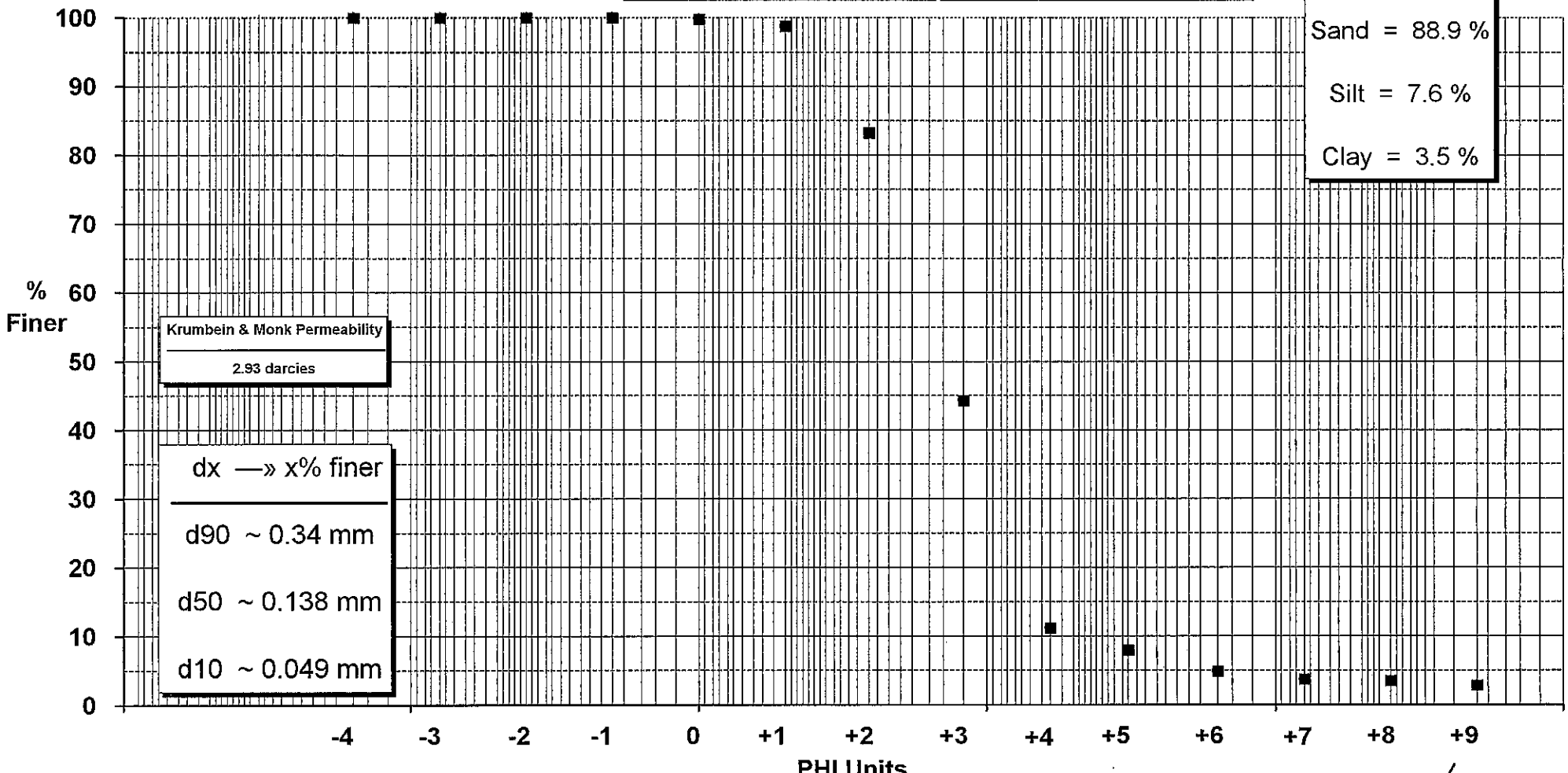
Maxxam Analytics

Maxxam ID: FI9634-01

GB-G

Percent Coarser than 75 µm (PHI = 3.737)	Percent Coarser than 50 µm (PHI = 4.322)
80.2 %	89.9 %

Wentworth	
Gravel	0.0 %
Sand	88.9 %
Silt	7.6 %
Clay	3.5 %



Krumbein & Monk Permeability
2.93 darcies

dx —» x% finer
d90 ~ 0.34 mm
d50 ~ 0.138 mm
d10 ~ 0.049 mm

Approved

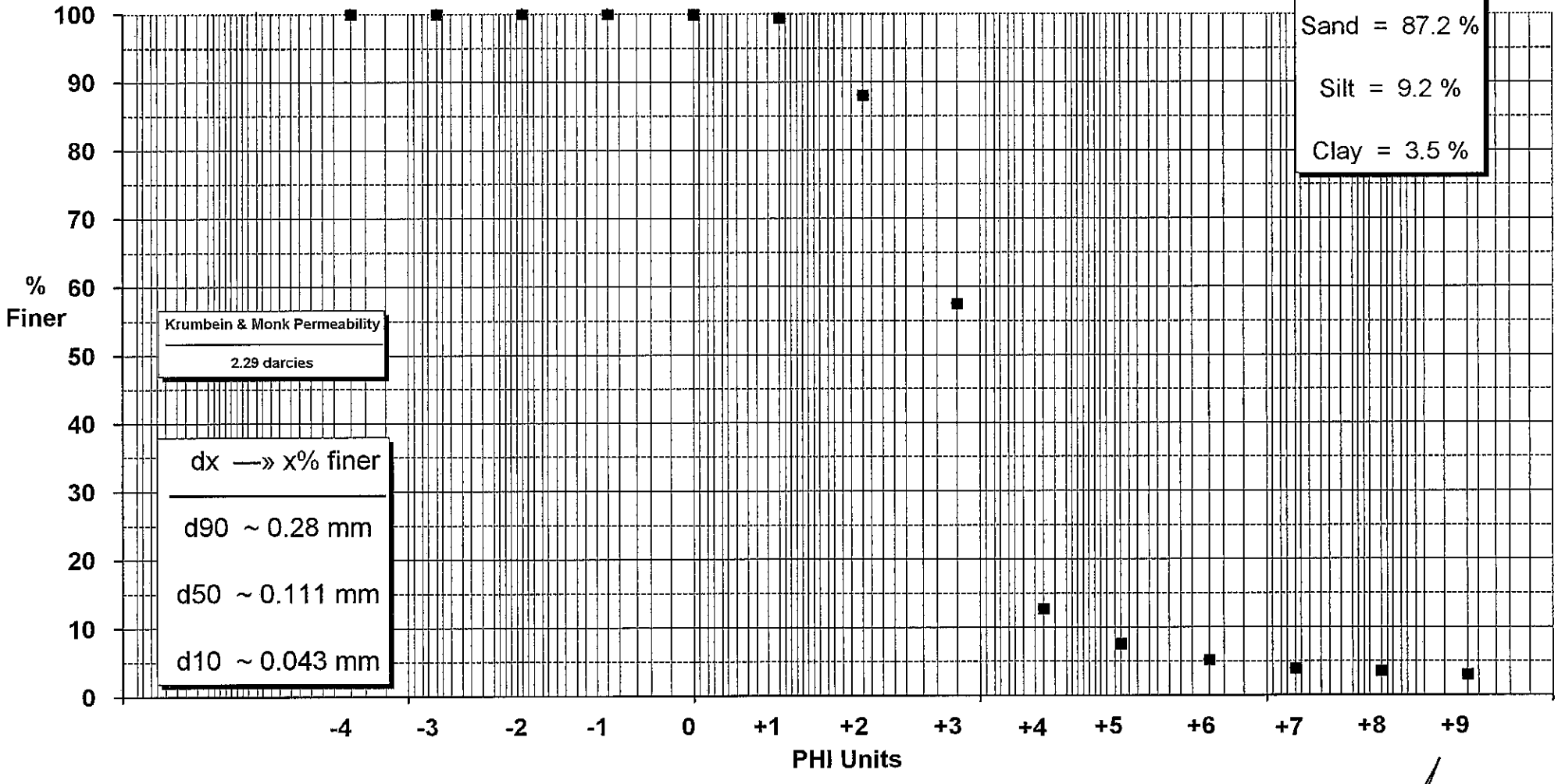
Maxxam Analytics

Maxxam ID: FI9635-01

GB-H

Percent Coarser than 75 µm (PHI = 3.737)	Percent Coarser than 50 µm (PHI = 4.322)
75.5 %	88.9 %

Wentworth	
Gravel	0.0 %
Sand	87.2 %
Silt	9.2 %
Clay	3.5 %



Krumbein & Monk Permeability
2.29 darcies

dx —» x% finer	
d90	~ 0.28 mm
d50	~ 0.111 mm
d10	~ 0.043 mm

Approved

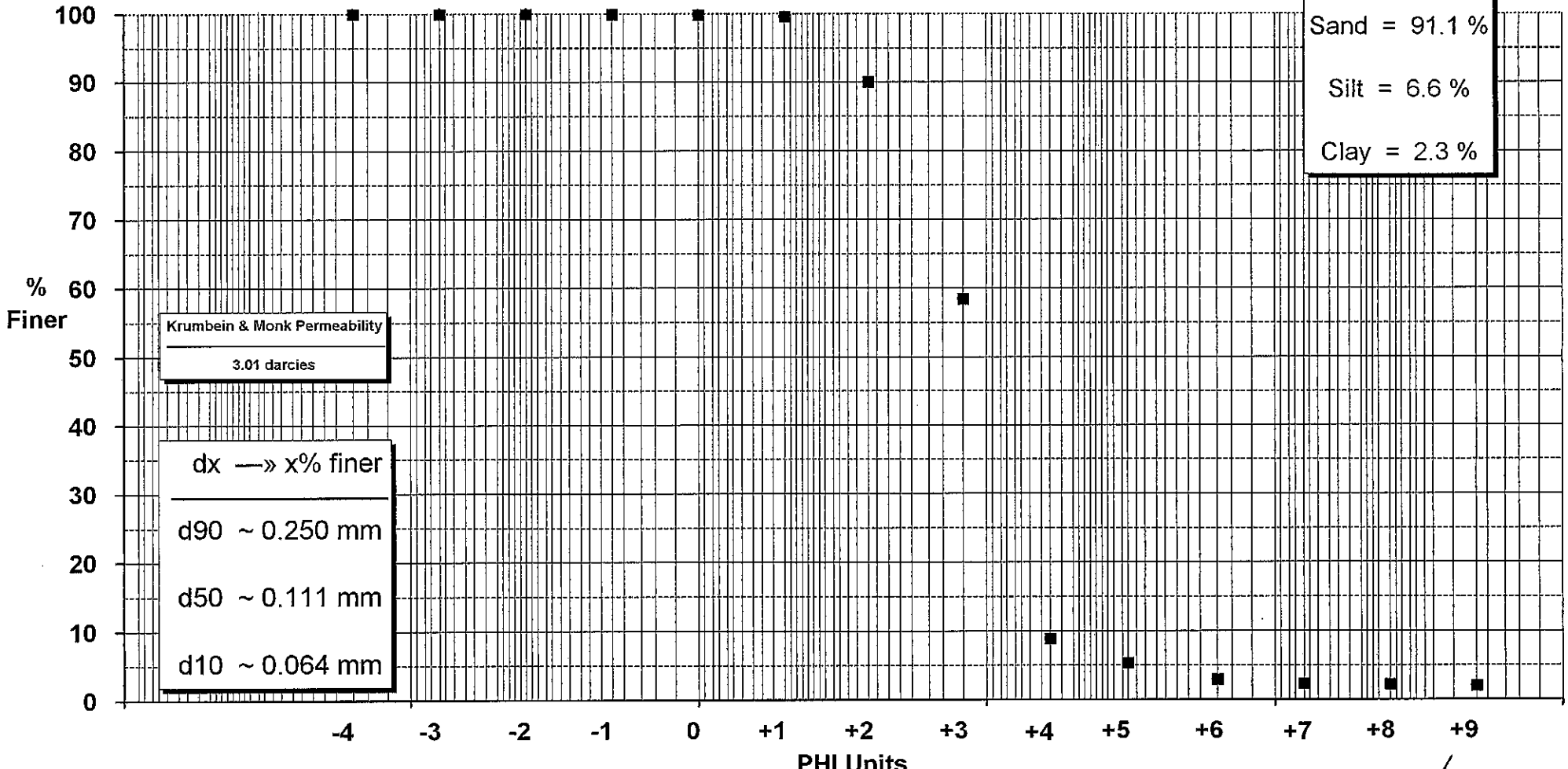
Maxxam Analytics

Maxxam ID: FI9636-01

GB-HH

Percent Coarser than 75 µm (PHI = 3.737)	Percent Coarser than 50 µm (PHI = 4.322)
78.1 %	92.3 %

Wentworth	
Gravel	0.0 %
Sand	91.1 %
Silt	6.6 %
Clay	2.3 %



Krumbein & Monk Permeability
3.01 darcies

dx —» x% finer	
d90	~ 0.250 mm
d50	~ 0.111 mm
d10	~ 0.064 mm

Approved

Your P.O. #: 300
Your Project #: 1215
Site: GLACE BAY MSSP
Your C.O.C. #: ES012510

Attention: Kelley Fraser
Stantec Consulting Ltd
40 Highfield Park Drive
Suite 102
Dartmouth, NS
B3A 0A3

Report Date: 2010/04/20
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B032149
Received: 2010/03/17, 15:32

Sample Matrix: Soil
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Chromium (VI) in Soil (1)	9	2010/03/25	2010/03/26	CAM SOP-00420	EPA 3060A
TEH in Soil (PIRI)	6	2010/03/19	2010/03/19	ATL SOP 00111 R3	Based on Atl. PIRI
TEH in Soil (PIRI)	3	2010/03/19	2010/03/20	ATL SOP 00111 R3	Based on Atl. PIRI
Mercury (CVAA)	9	2010/03/26	2010/03/29	ATL SOP 00026 R6	Based on EPA245.5
Metals Solid Avail. Unified MS Low N-per	9	2010/03/22	2010/03/22	ATL SOP 00024 R5	Based on EPA6020A
Moisture	9	N/A	2010/03/18	ATL SOP 00001 R3	MOE Handbook 1983
MOISTURE (1)	9	N/A	2010/03/26	CAM SOP-00445	McKeague 2nd ed 1978
OC Pesticides (Selected) & PCB (2)	9	2010/03/24	2010/03/25	CAM SOP-00307	SW846 8081, 8082
PAH in sediment by GC/MS (Low Level)	5	2010/03/23	2010/03/26	ATL SOP 00102 R4	based on EPA8270C
PAH in sediment by GC/MS (Low Level)	4	2010/03/23	2010/03/27	ATL SOP 00102 R4	based on EPA8270C
VPH in Soil - Low Level	6	2010/03/18	2010/03/19	ATL SOP 00117 R4/00119 R6	Based on Atl. PIRI
VPH in Soil - Low Level	3	2010/03/18	2010/03/20	ATL SOP 00117 R4/00119 R6	Based on Atl. PIRI
Particle size in solids (pipette&sieve)	9	N/A	2010/03/25	ATL SOP 00012 R3	based on MSAMS-1978
Total Carbon in Solids by Ind.	9	2010/03/22	2010/03/22	ATL SOP 00044 R3/00045 R4	LECO 203-601-224
TIC in soil	5	2010/03/18	2010/03/22	ATL SOP 00044 R3/00045 R4	LECO 203-601-224
TIC in soil	4	2010/03/18	2010/03/25	ATL SOP 00044 R3/00045 R4	LECO 203-601-224
Total Organic Carbon in Soil	5	2010/03/22	2010/03/22	ATL SOP 00044 R3/00045 R4	LECO 203-601-224
Total Organic Carbon in Soil	4	2010/03/23	2010/03/23	ATL SOP 00044 R3/00045 R4	LECO 203-601-224
ModTPH (T1) Calc. for Soil	9	2010/03/18	2010/03/22		Based on Atl. PIRI

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Analytics Mississauga
(2) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

../2

Your P.O. #: 300
Your Project #: 1215
Site: GLACE BAY MSSP
Your C.O.C. #: ES012510

Attention: Kelley Fraser
Stantec Consulting Ltd
40 Highfield Park Drive
Suite 102
Dartmouth, NS
B3A 0A3

Report Date: 2010/04/20
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

MARIE (MCNAIR) MUISE, Project Manager
Email: marie.muise@maxxamanalytics.com
Phone# (902) 420-0203 Ext:236

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B032149
Report Date: 2010/04/20

Stantec Consulting Ltd
Client Project #: 1215
Project name: GLACE BAY MSSP
Your P.O. #: 300

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FI9627		FI9629		FI9630		FI9631		
Sampling Date		2010/03/17		2010/03/17		2010/03/17		2010/03/17		
COC Number		ES012510		ES012510		ES012510		ES012510		
	Units	**GB-A**	**RDL**	**GB-B**	**RDL**	**GB-C**	**RDL**	**GB-D**	**RDL**	**QC Batch**
Inorganics										
Total Inorganic Carbon (C)	g/kg	6.8	0.8	34	1	0.8	0.6	11	0.9	2103160
Moisture	%	56	1	61	1	59	1	56	1	2103180
Organic Carbon (TOC)	g/kg	39	0.8	35	0.5	62	0.6	63	0.6	2105612
Total Carbon-combustion IR	g/kg	46	0.8	69	1	62	0.4	74	0.9	2105887
< -4 Phi (16 mm)	%	100	0.1	100	0.1	100	0.1	100	0.1	2108866
< -3 Phi (8 mm)	%	100	0.1	100	0.1	100	0.1	100	0.1	2108866
< -2 Phi (4 mm)	%	100	0.1	100	0.1	100	0.1	100	0.1	2108866
< -1 Phi (2 mm)	%	100	0.1	100	0.1	100	0.1	100	0.1	2108866
< 0 Phi (1 mm)	%	98	0.1	97	0.1	99	0.1	98	0.1	2108866
< +1 Phi (0.5 mm)	%	95	0.1	94	0.1	97	0.1	95	0.1	2108866
< +2 Phi (0.25 mm)	%	92	0.1	92	0.1	92	0.1	89	0.1	2108866
< +3 Phi (0.12 mm)	%	89	0.1	90	0.1	87	0.1	82	0.1	2108866
< +4 Phi (0.062 mm)	%	85	0.1	87	0.1	77	0.1	71	0.1	2108866
< +5 Phi (0.031 mm)	%	77	0.1	79	0.1	68	0.1	64	0.1	2108866
< +6 Phi (0.016 mm)	%	53	0.1	61	0.1	54	0.1	43	0.1	2108866
< +7 Phi (0.0078 mm)	%	26	0.1	32	0.1	30	0.1	24	0.1	2108866
< +8 Phi (0.0039 mm)	%	20	0.1	25	0.1	23	0.1	19	0.1	2108866
< +9 Phi (0.0020 mm)	%	14	0.1	16	0.1	16	0.1	14	0.1	2108866
Gravel	%	0.3	0.1	ND	0.1	ND	0.1	ND	0.1	2108866
Sand	%	15	0.1	13	0.1	23	0.1	29	0.1	2108866
Silt	%	65	0.1	62	0.1	53	0.1	52	0.1	2108866
Clay	%	20	0.1	25	0.1	23	0.1	19	0.1	2108866

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B032149
Report Date: 2010/04/20

Stantec Consulting Ltd
Client Project #: 1215
Project name: GLACE BAY MSSP
Your P.O. #: 300

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FI9632			FI9633		FI9634	FI9635		
Sampling Date		2010/03/17			2010/03/17		2010/03/17	2010/03/17		
COC Number		ES012510			ES012510		ES012510	ES012510		
	Units	**GB-E**	**RDL**	**QC Batch**	**GB-F**	**RDL**	**GB-G**	**GB-H**	**RDL**	**QC Batch**
Inorganics										
Total Inorganic Carbon (C)	g/kg	15	2	2103160	5	1	5.4	6.6	0.2	2103160
Moisture	%	74	1	2103180	53	1	26	28	1	2103180
Organic Carbon (TOC)	g/kg	69	2	2105612	59	1	11	7.5	0.2	2106619
Total Carbon-combustion IR	g/kg	84	0.7	2105887	64	1	16	14	0.2	2105887
< -4 Phi (16 mm)	%	100	0.1	2108866	100	0.1	100	100	0.1	2108866
< -3 Phi (8 mm)	%	100	0.1	2108866	100	0.1	100	100	0.1	2108866
< -2 Phi (4 mm)	%	100	0.1	2108866	100	0.1	100	100	0.1	2108866
< -1 Phi (2 mm)	%	97	0.1	2108866	99	0.1	100	100	0.1	2108866
< 0 Phi (1 mm)	%	93	0.1	2108866	97	0.1	100	100	0.1	2108866
< +1 Phi (0.5 mm)	%	87	0.1	2108866	93	0.1	99	99	0.1	2108866
< +2 Phi (0.25 mm)	%	82	0.1	2108866	88	0.1	83	88	0.1	2108866
< +3 Phi (0.12 mm)	%	78	0.1	2108866	83	0.1	44	57	0.1	2108866
< +4 Phi (0.062 mm)	%	68	0.1	2108866	75	0.1	11	13	0.1	2108866
< +5 Phi (0.031 mm)	%	56	0.1	2108866	58	0.1	7.9	7.6	0.1	2108866
< +6 Phi (0.016 mm)	%	46	0.1	2108866	40	0.1	4.9	5.2	0.1	2108866
< +7 Phi (0.0078 mm)	%	34	0.1	2108866	21	0.1	3.7	3.9	0.1	2108866
< +8 Phi (0.0039 mm)	%	30	0.1	2108866	18	0.1	3.5	3.5	0.1	2108866
< +9 Phi (0.0020 mm)	%	26	0.1	2108866	14	0.1	2.9	3.1	0.1	2108866
Gravel	%	2.6	0.1	2108866	0.6	0.1	ND	ND	0.1	2108866
Sand	%	29	0.1	2108866	24	0.1	89	87	0.1	2108866
Silt	%	38	0.1	2108866	57	0.1	7.6	9.2	0.1	2108866
Clay	%	30	0.1	2108866	18	0.1	3.5	3.5	0.1	2108866

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B032149
Report Date: 2010/04/20

Stantec Consulting Ltd
Client Project #: 1215
Project name: GLACE BAY MSSP
Your P.O. #: 300

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FI9636		
Sampling Date		2010/03/17		
COC Number		ES012510		
	Units	**GB-HH**	**RDL**	**QC Batch**
Inorganics				
Total Inorganic Carbon (C)	g/kg	14	0.2	2103160
Moisture	%	25	1	2103180
Organic Carbon (TOC)	g/kg	14	0.2	2106619
Total Carbon-combustion IR	g/kg	28	0.2	2105887
< -4 Phi (16 mm)	%	100	0.1	2108866
< -3 Phi (8 mm)	%	100	0.1	2108866
< -2 Phi (4 mm)	%	100	0.1	2108866
< -1 Phi (2 mm)	%	100	0.1	2108866
< 0 Phi (1 mm)	%	100	0.1	2108866
< +1 Phi (0.5 mm)	%	100	0.1	2108866
< +2 Phi (0.25 mm)	%	90	0.1	2108866
< +3 Phi (0.12 mm)	%	58	0.1	2108866
< +4 Phi (0.062 mm)	%	8.9	0.1	2108866
< +5 Phi (0.031 mm)	%	5.4	0.1	2108866
< +6 Phi (0.016 mm)	%	3.0	0.1	2108866
< +7 Phi (0.0078 mm)	%	2.3	0.1	2108866
< +8 Phi (0.0039 mm)	%	2.3	0.1	2108866
< +9 Phi (0.0020 mm)	%	2.1	0.1	2108866
Gravel	%	ND	0.1	2108866
Sand	%	91	0.1	2108866
Silt	%	6.6	0.1	2108866
Clay	%	2.3	0.1	2108866

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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MERCURY BY COLD VAPOUR AA (SOIL)

Maxxam ID		FI9627	FI9629	FI9630	FI9631	FI9632	FI9633	FI9634		
Sampling Date		2010/03/17	2010/03/17	2010/03/17	2010/03/17	2010/03/17	2010/03/17	2010/03/17		
COC Number		ES012510	ES012510	ES012510	ES012510	ES012510	ES012510	ES012510		
	Units	**GB-A**	**GB-B**	**GB-C**	**GB-D**	**GB-E**	**GB-F**	**GB-G**	**RDL**	**QC Batch**
Metals										
Mercury (Hg)	mg/kg	0.04	0.02	0.03	0.03	0.02	0.02	0.02	0.01	2110944

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FI9635	FI9636		
Sampling Date		2010/03/17	2010/03/17		
COC Number		ES012510	ES012510		
	Units	**GB-H**	**GB-HH**	**RDL**	**QC Batch**
Metals					
Mercury (Hg)	mg/kg	0.01	0.01	0.01	2110944

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B032149
Report Date: 2010/04/20

Stantec Consulting Ltd
Client Project #: 1215
Project name: GLACE BAY MSSP
Your P.O. #: 300

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FI9627	FI9629	FI9630	FI9631		FI9632		
Sampling Date		2010/03/17	2010/03/17	2010/03/17	2010/03/17		2010/03/17		
COC Number		ES012510	ES012510	ES012510	ES012510		ES012510		
	Units	**GB-A**	**GB-B**	**GB-C**	**GB-D**	**RDL**	**GB-E**	**RDL**	**QC Batch**
Metals									
Chromium (VI)	ug/g	1.1 (1)	ND (1)	ND (1)	ND (1)	0.8	ND	0.2	2108869
Available Aluminum (Al)	mg/kg	11000	11000	9800	9700	10	8100	10	2105702
Available Antimony (Sb)	mg/kg	ND	ND	ND	ND	2	ND	2	2105702
Available Arsenic (As)	mg/kg	14	12	9	9	2	11	2	2105702
Available Barium (Ba)	mg/kg	94	110	70	63	5	68	5	2105702
Available Beryllium (Be)	mg/kg	ND	ND	ND	ND	2	ND	2	2105702
Available Bismuth (Bi)	mg/kg	ND	ND	ND	ND	2	ND	2	2105702
Available Boron (B)	mg/kg	34	29	24	34	5	38	5	2105702
Available Cadmium (Cd)	mg/kg	0.7	0.5	0.7	0.9	0.3	0.4	0.3	2105702
Available Chromium (Cr)	mg/kg	22	22	21	20	2	20	2	2105702
Available Cobalt (Co)	mg/kg	11	12	12	11	1	9	1	2105702
Available Copper (Cu)	mg/kg	43	31	39	38	2	22	2	2105702
Available Iron (Fe)	mg/kg	28000	29000	26000	27000	50	24000	50	2105702
Available Lead (Pb)	mg/kg	34	21	20	21	0.5	16	0.5	2105702
Available Lithium (Li)	mg/kg	22	22	20	20	2	16	2	2105702
Available Manganese (Mn)	mg/kg	530	580	490	500	2	500	2	2105702
Available Molybdenum (Mo)	mg/kg	2	3	9	6	2	3	2	2105702
Available Nickel (Ni)	mg/kg	27	29	28	26	2	24	2	2105702
Available Rubidium (Rb)	mg/kg	11	12	10	10	2	9	2	2105702
Available Selenium (Se)	mg/kg	ND	ND	ND	ND	1	ND	1	2105702
Available Silver (Ag)	mg/kg	ND	ND	ND	ND	0.5	ND	0.5	2105702
Available Strontium (Sr)	mg/kg	46	53	41	51	5	100	5	2105702
Available Thallium (Tl)	mg/kg	0.3	0.2	0.3	0.3	0.1	0.1	0.1	2105702
Available Tin (Sn)	mg/kg	4	2	2	3	2	2	2	2105702
Available Uranium (U)	mg/kg	0.8	0.8	1.7	1.5	0.1	0.7	0.1	2105702
Available Vanadium (V)	mg/kg	31	30	29	28	2	22	2	2105702
Available Zinc (Zn)	mg/kg	110	88	98	110	5	66	5	2105702

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Sample contained a high amount of moisture. Reporting limits were adjusted for dry weight of sample.

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Client Project #: 1215
Project name: GLACE BAY MSSP
Your P.O. #: 300

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FI9633		FI9634	FI9635	FI9636		
Sampling Date		2010/03/17		2010/03/17	2010/03/17	2010/03/17		
COC Number		ES012510		ES012510	ES012510	ES012510		
	Units	**GB-F**	**RDL**	**GB-G**	**GB-H**	**GB-HH**	**RDL**	**QC Batch**
Metals								
Chromium (VI)	ug/g	ND (1)	0.4	ND	ND	ND	0.2	2108869
Available Aluminum (Al)	mg/kg	7900	10	6000	6200	6200	10	2105702
Available Antimony (Sb)	mg/kg	ND	2	ND	ND	ND	2	2105702
Available Arsenic (As)	mg/kg	9	2	11	10	10	2	2105702
Available Barium (Ba)	mg/kg	73	5	38	43	43	5	2105702
Available Beryllium (Be)	mg/kg	ND	2	ND	ND	ND	2	2105702
Available Bismuth (Bi)	mg/kg	ND	2	ND	ND	ND	2	2105702
Available Boron (B)	mg/kg	38	5	8	6	6	5	2105702
Available Cadmium (Cd)	mg/kg	ND	0.3	ND	ND	ND	0.3	2105702
Available Chromium (Cr)	mg/kg	20	2	11	11	11	2	2105702
Available Cobalt (Co)	mg/kg	10	1	7	7	7	1	2105702
Available Copper (Cu)	mg/kg	24	2	18	17	14	2	2105702
Available Iron (Fe)	mg/kg	24000	50	24000	23000	24000	50	2105702
Available Lead (Pb)	mg/kg	16	0.5	10	10	11	0.5	2105702
Available Lithium (Li)	mg/kg	17	2	12	12	12	2	2105702
Available Manganese (Mn)	mg/kg	510	2	720	660	660	2	2105702
Available Molybdenum (Mo)	mg/kg	3	2	ND	ND	ND	2	2105702
Available Nickel (Ni)	mg/kg	24	2	14	15	15	2	2105702
Available Rubidium (Rb)	mg/kg	9	2	4	5	5	2	2105702
Available Selenium (Se)	mg/kg	ND	1	ND	ND	ND	1	2105702
Available Silver (Ag)	mg/kg	ND	0.5	ND	ND	ND	0.5	2105702
Available Strontium (Sr)	mg/kg	77	5	62	52	57	5	2105702
Available Thallium (Tl)	mg/kg	0.1	0.1	ND	ND	ND	0.1	2105702
Available Tin (Sn)	mg/kg	2	2	ND	4	3	2	2105702
Available Uranium (U)	mg/kg	0.6	0.1	0.3	0.4	0.4	0.1	2105702
Available Vanadium (V)	mg/kg	23	2	15	16	16	2	2105702
Available Zinc (Zn)	mg/kg	65	5	52	56	47	5	2105702

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Sample contained a high amount of moisture. Reporting limits were adjusted for dry weight of sample.

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SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FI9627	FI9629	FI9630	FI9631	FI9632	FI9633		
Sampling Date		2010/03/17	2010/03/17	2010/03/17	2010/03/17	2010/03/17	2010/03/17		
COC Number		ES012510	ES012510	ES012510	ES012510	ES012510	ES012510		
	Units	**GB-A**	**GB-B**	**GB-C**	**GB-D**	**GB-E**	**GB-F**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	0.084	0.096	0.086	0.088	0.11	0.12	0.005	2106544
2-Methylnaphthalene	mg/kg	0.12	0.14	0.12	0.14	0.16	0.18	0.005	2106544
Acenaphthene	mg/kg	0.024	0.037	0.038	0.027	0.064	0.079	0.005	2106544
Acenaphthylene	mg/kg	ND	ND	ND	ND	ND	0.012	0.005	2106544
Anthracene	mg/kg	0.12	0.15	0.14	0.14	0.32	0.29	0.005	2106544
Benzo(a)anthracene	mg/kg	0.19	0.13	0.13	0.15	0.16	0.23	0.005	2106544
Benzo(a)pyrene	mg/kg	0.14	0.089	0.085	0.12	0.11	0.14	0.005	2106544
Benzo(b)fluoranthene	mg/kg	0.11	0.060	0.055	0.11	0.082	0.082	0.005	2106544
Benzo(g,h,i)perylene	mg/kg	0.11	0.068	0.066	0.092	0.058	0.079	0.005	2106544
Benzo(k)fluoranthene	mg/kg	0.12	0.082	0.067	0.091	0.048	0.089	0.005	2106544
Chrysene	mg/kg	0.22	0.15	0.13	0.19	0.16	0.24	0.005	2106544
Dibenz(a,h)anthracene	mg/kg	0.031	0.019	0.018	0.026	ND	0.029	0.005	2106544
Fluoranthene	mg/kg	0.45	0.37	0.34	0.37	0.45	0.68	0.005	2106544
Fluorene	mg/kg	0.043	0.060	0.069	0.048	0.10	0.15	0.005	2106544
Indeno(1,2,3-cd)pyrene	mg/kg	0.091	0.050	0.048	0.073	0.047	0.064	0.005	2106544
Naphthalene	mg/kg	0.096	0.13	0.095	0.10	0.20	0.19	0.005	2106544
Perylene	mg/kg	0.041	0.028	0.023	0.038	0.027	0.032	0.005	2106544
Phenanthrene	mg/kg	0.38	0.46	0.32	0.32	0.65	1.0	0.005	2106544
Pyrene	mg/kg	0.34	0.27	0.25	0.27	0.32	0.48	0.005	2106544
Surrogate Recovery (%)									
D10-Anthracene	%	106	100	102	105	118	80	N/A	2106544
D14-Terphenyl	%	90	90	92	101	103	91	N/A	2106544
D8-Acenaphthylene	%	92	91	85	94	105	90	N/A	2106544

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2010/04/20

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Client Project #: 1215
Project name: GLACE BAY MSSP
Your P.O. #: 300

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FI9634	FI9635	FI9636		
Sampling Date		2010/03/17	2010/03/17	2010/03/17		
COC Number		ES012510	ES012510	ES012510		
	Units	**GB-G**	**GB-H**	**GB-HH**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons						
1-Methylnaphthalene	mg/kg	0.031	0.035	0.052	0.005	2106544
2-Methylnaphthalene	mg/kg	0.041	0.050	0.075	0.005	2106544
Acenaphthene	mg/kg	ND	0.009	0.011	0.005	2106544
Acenaphthylene	mg/kg	ND	ND	ND	0.005	2106544
Anthracene	mg/kg	0.017	0.041	0.029	0.005	2106544
Benzo(a)anthracene	mg/kg	0.015	0.025	0.028	0.005	2106544
Benzo(a)pyrene	mg/kg	0.013	0.021	0.018	0.005	2106544
Benzo(b)fluoranthene	mg/kg	0.009	0.017	0.015	0.005	2106544
Benzo(g,h,i)perylene	mg/kg	0.013	0.019	0.018	0.005	2106544
Benzo(k)fluoranthene	mg/kg	0.010	0.010	0.014	0.005	2106544
Chrysene	mg/kg	0.023	0.031	0.034	0.005	2106544
Dibenz(a,h)anthracene	mg/kg	ND	ND	ND	0.005	2106544
Fluoranthene	mg/kg	0.046	0.067	0.071	0.005	2106544
Fluorene	mg/kg	0.011	0.015	0.019	0.005	2106544
Indeno(1,2,3-cd)pyrene	mg/kg	0.008	0.014	0.011	0.005	2106544
Naphthalene	mg/kg	0.041	0.052	0.069	0.005	2106544
Perylene	mg/kg	ND	ND	ND	0.005	2106544
Phenanthrene	mg/kg	0.052	0.10	0.10	0.005	2106544
Pyrene	mg/kg	0.036	0.053	0.058	0.005	2106544
Surrogate Recovery (%)						
D10-Anthracene	%	84	99	97	N/A	2106544
D14-Terphenyl	%	91	89	106	N/A	2106544
D8-Acenaphthylene	%	84	86	101	N/A	2106544

ND = Not detected
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RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		FI9627	FI9627	FI9629	FI9630	FI9631	FI9632		
Sampling Date		2010/03/17	2010/03/17	2010/03/17	2010/03/17	2010/03/17	2010/03/17		
COC Number		ES012510	ES012510	ES012510	ES012510	ES012510	ES012510		
	Units	**GB-A**	**GB-A Lab-Dup**	**GB-B**	**GB-C**	**GB-D**	**GB-E**	**RDL**	**QC Batch**
Petroleum Hydrocarbons									
Benzene	mg/kg	0.017	N/A	0.036	ND	0.029	0.033	0.003	2104379
Toluene	mg/kg	ND	N/A	ND	ND	ND	ND	0.03	2104379
Ethylbenzene	mg/kg	ND	N/A	ND	ND	ND	ND	0.01	2104379
Xylene (Total)	mg/kg	ND	N/A	ND	ND	ND	ND	0.05	2104379
C6 - C10 (less BTEX)	mg/kg	ND	N/A	ND	ND	ND	ND	3	2104379
>C10-C21 Hydrocarbons	mg/kg	86	87	130	79	85	250	15	2104210
>C21-<C32 Hydrocarbons	mg/kg	330	360	450	240	360	310	15	2104210
Modified TPH (Tier1)	mg/kg	420	N/A	570	320	450	560	20	2103121
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	94	97	95	94	93	94	N/A	2104210
n-Dotriacontane - Extractable	%	92 (1)	88	88 (2)	85 (2)	79 (2)	107 (2)	N/A	2104210
Isobutylbenzene - Volatile	%	94	N/A	97	102	92	95	N/A	2104379

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Possible lube oil fraction. Unidentified compound(s) in fuel / lube range.
(2) One product in fuel / lube range. Unidentified compound(s) in fuel / lube range.

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Your P.O. #: 300

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		FI9633	FI9634	FI9635	FI9636		
Sampling Date		2010/03/17	2010/03/17	2010/03/17	2010/03/17		
COC Number		ES012510	ES012510	ES012510	ES012510		
	Units	**GB-F**	**GB-G**	**GB-H**	**GB-HH**	**RDL**	**QC Batch**
Petroleum Hydrocarbons							
Benzene	mg/kg	0.051	0.012	0.009	0.007	0.003	2104379
Toluene	mg/kg	0.11	ND	ND	ND	0.03	2104379
Ethylbenzene	mg/kg	ND	ND	ND	ND	0.01	2104379
Xylene (Total)	mg/kg	ND	ND	ND	ND	0.05	2104379
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	ND	3	2104379
>C10-C21 Hydrocarbons	mg/kg	87	ND	ND	ND	15	2104210
>C21-<C32 Hydrocarbons	mg/kg	170	ND	ND	27	15	2104210
Modified TPH (Tier1)	mg/kg	260	ND	ND	27	20	2103121
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	90	94	89	94	N/A	2104210
n-Dotriacontane - Extractable	%	94 (1)	99	97	99 (2)	N/A	2104210
Isobutylbenzene - Volatile	%	95	98	105	101	N/A	2104379

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) One product in fuel / lube range. Unidentified compound(s) in fuel / lube range.
(2) Possible lube oil fraction.

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ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FI9627	FI9629	FI9630		FI9631		FI9632		
Sampling Date		2010/03/17	2010/03/17	2010/03/17		2010/03/17		2010/03/17		
COC Number		ES012510	ES012510	ES012510		ES012510		ES012510		
	Units	**GB-A**	**GB-B**	**GB-C**	**RDL**	**GB-D**	**RDL**	**GB-E**	**RDL**	**QC Batch**
Pesticides & Herbicides										
Aroclor 1262	ug/g	ND	ND	ND	0.04	ND	0.2	ND	0.06	2107501
Aroclor 1268	ug/g	ND	ND	ND	0.04	ND	0.2	ND	0.06	2107501
o,p-DDD	ug/g	ND	ND	ND	0.005	ND	0.02	ND	0.008	2107501
p,p-DDD	ug/g	ND	ND	ND	0.005	ND	0.02	ND	0.008	2107501
o,p-DDD + p,p-DDD	ug/g	ND	ND	ND	0.005	ND	0.02	ND	0.008	2107501
o,p-DDE	ug/g	ND	ND	ND	0.005	ND	0.02	ND	0.008	2107501
p,p-DDE	ug/g	ND	ND	ND	0.005	ND	0.02	ND	0.008	2107501
o,p-DDE + p,p-DDE	ug/g	ND	ND	ND	0.005	ND	0.02	ND	0.008	2107501
o,p-DDT	ug/g	ND	ND	ND	0.005	ND	0.02	ND	0.008	2107501
p,p-DDT	ug/g	ND	ND	ND	0.005	ND	0.02	ND	0.008	2107501
o,p-DDT + p,p-DDT	ug/g	ND	ND	ND	0.005	ND	0.02	ND	0.008	2107501
DDT+ Metabolites	ug/g	ND	ND	ND	0.005	ND	0.02	ND	0.008	2107501
Total PCB	ug/g	ND	ND	ND	0.08	ND	0.3	ND	0.1	2107501
Aroclor 1016	ug/g	ND	ND	ND	0.04	ND	0.2	ND	0.06	2107501
Aroclor 1221	ug/g	ND	ND	ND	0.08	ND	0.3	ND	0.1	2107501
Aroclor 1232	ug/g	ND	ND	ND	0.04	ND	0.2	ND	0.06	2107501
Aroclor 1242	ug/g	ND	ND	ND	0.04	ND	0.2	ND	0.06	2107501
Aroclor 1248	ug/g	ND	ND	ND	0.04	ND	0.2	ND	0.06	2107501
Aroclor 1254	ug/g	ND	ND	ND	0.04	ND	0.2	ND	0.06	2107501
Aroclor 1260	ug/g	ND	ND	ND	0.04	ND	0.2	ND	0.06	2107501
Surrogate Recovery (%)										
2,4,5,6-Tetrachloro-m-xylene	%	83	80	96	N/A	96	N/A	82	N/A	2107501
Decachlorobiphenyl	%	93	92	102	N/A	107	N/A	86	N/A	2107501

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B032149
Report Date: 2010/04/20

Stantec Consulting Ltd
Client Project #: 1215
Project name: GLACE BAY MSSP
Your P.O. #: 300

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FI9633		FI9634	FI9635	FI9636		
Sampling Date		2010/03/17		2010/03/17	2010/03/17	2010/03/17		
COC Number		ES012510		ES012510	ES012510	ES012510		
	Units	**GB-F**	**RDL**	**GB-G**	**GB-H**	**GB-HH**	**RDL**	**QC Batch**
Pesticides & Herbicides								
Aroclor 1262	ug/g	ND	0.04	ND	ND	ND	0.02	2107501
Aroclor 1268	ug/g	ND	0.04	ND	ND	ND	0.02	2107501
o,p-DDD	ug/g	ND	0.005	ND	ND	ND	0.002	2107501
p,p-DDD	ug/g	ND	0.005	ND	ND	ND	0.002	2107501
o,p-DDD + p,p-DDD	ug/g	ND	0.005	ND	ND	ND	0.002	2107501
o,p-DDE	ug/g	ND	0.005	ND	ND	ND	0.002	2107501
p,p-DDE	ug/g	ND	0.005	ND	ND	ND	0.002	2107501
o,p-DDE + p,p-DDE	ug/g	ND	0.005	ND	ND	ND	0.002	2107501
o,p-DDT	ug/g	ND	0.005	ND	ND	ND	0.002	2107501
p,p-DDT	ug/g	ND	0.005	ND	ND	ND	0.002	2107501
o,p-DDT + p,p-DDT	ug/g	ND	0.005	ND	ND	ND	0.002	2107501
DDT+ Metabolites	ug/g	ND	0.005	ND	ND	ND	0.002	2107501
Total PCB	ug/g	ND	0.08	ND	ND	ND	0.03	2107501
Aroclor 1016	ug/g	ND	0.04	ND	ND	ND	0.02	2107501
Aroclor 1221	ug/g	ND	0.08	ND	ND	ND	0.03	2107501
Aroclor 1232	ug/g	ND	0.04	ND	ND	ND	0.02	2107501
Aroclor 1242	ug/g	ND	0.04	ND	ND	ND	0.02	2107501
Aroclor 1248	ug/g	ND	0.04	ND	ND	ND	0.02	2107501
Aroclor 1254	ug/g	ND	0.04	ND	ND	ND	0.02	2107501
Aroclor 1260	ug/g	ND	0.04	ND	ND	ND	0.02	2107501
Surrogate Recovery (%)								
2,4,5,6-Tetrachloro-m-xylene	%	84	N/A	76	74	77	N/A	2107501
Decachlorobiphenyl	%	90	N/A	91	91	87	N/A	2107501

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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GENERAL COMMENTS

TEH Analysis: Samples FI9634-01, FI9635-01: No presence of creosote.

TEH Analysis: Samples FI9627-01, FI9629-01, FI9630-01, FI9631-01, FI9632-01, FI9633-01, FI9636-01: We are unable to confirm the presence of creosote in the samples in question. The sample has chromatographic peaks present that are consistent with peaks observed in creosote reference materials. The source of the peaks cannot be determined based on the chromatographic information.

OC Pesticides Analysis: Detection limits for some samples were adjusted for high moisture content.

Samples re-analyzed and selenium data reported with lower RDL at request of client.

Revised report: Samples re-analyzed to obtain lower Selenium RDLs as per client request. 4/20/10 MMC

Sample FI9631-01: OC Pesticides Analysis: Due to colour interferences, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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Attention: Kelley Fraser
Client Project #: 1215
P.O. #: 300
Project name: GLACE BAY MSSP

Quality Assurance Report

Maxxam Job Number: DB032149

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2104210	LHU	Matrix Spike						
		[FI9627-01]	Isobutylbenzene - Extractable	2010/03/20		98	%	30 - 130
			n-Dotriacontane - Extractable	2010/03/20		84	%	30 - 130
			>C10-C21 Hydrocarbons	2010/03/20		95	%	30 - 130
			>C21-<C32 Hydrocarbons	2010/03/20		NC	%	30 - 130
		Spiked Blank	Isobutylbenzene - Extractable	2010/03/19		93	%	30 - 130
			n-Dotriacontane - Extractable	2010/03/19		95	%	30 - 130
			>C10-C21 Hydrocarbons	2010/03/19		90	%	30 - 130
			>C21-<C32 Hydrocarbons	2010/03/19		103	%	30 - 130
		Method Blank	Isobutylbenzene - Extractable	2010/03/19		92	%	30 - 130
			n-Dotriacontane - Extractable	2010/03/19		96	%	30 - 130
			>C10-C21 Hydrocarbons	2010/03/19	ND, RDL=15		mg/kg	
			>C21-<C32 Hydrocarbons	2010/03/19	ND, RDL=15		mg/kg	
		RPD [FI9627-01]	>C10-C21 Hydrocarbons	2010/03/20	1		%	50
			>C21-<C32 Hydrocarbons	2010/03/20	7.8		%	50
2104379	ASL	Matrix Spike	Isobutylbenzene - Volatile	2010/03/20		75	%	60 - 140
			Benzene	2010/03/20		72	%	60 - 140
			Toluene	2010/03/20		106	%	60 - 140
			Ethylbenzene	2010/03/20		89	%	60 - 140
			Xylene (Total)	2010/03/20		101	%	60 - 140
		Spiked Blank	Isobutylbenzene - Volatile	2010/03/19		95	%	60 - 140
			Benzene	2010/03/19		84	%	60 - 140
			Toluene	2010/03/19		84	%	60 - 140
			Ethylbenzene	2010/03/19		82	%	60 - 140
			Xylene (Total)	2010/03/19		87	%	60 - 140
		Method Blank	Isobutylbenzene - Volatile	2010/03/19		85	%	60 - 140
			Benzene	2010/03/19	ND, RDL=0.003		mg/kg	
			Toluene	2010/03/19	ND, RDL=0.03		mg/kg	
			Ethylbenzene	2010/03/19	ND, RDL=0.01		mg/kg	
			Xylene (Total)	2010/03/19	ND, RDL=0.05		mg/kg	
			C6 - C10 (less BTEX)	2010/03/19	ND, RDL=3		mg/kg	
		RPD	Benzene	2010/03/20	NC		%	50
			Toluene	2010/03/20	NC		%	50
			Ethylbenzene	2010/03/20	NC		%	50
			Xylene (Total)	2010/03/20	NC		%	50
			C6 - C10 (less BTEX)	2010/03/20	NC		%	50
2105612	JPU	QC Standard	Organic Carbon (TOC)	2010/03/22		100	%	75 - 125
		Method Blank	Organic Carbon (TOC)	2010/03/22	ND, RDL=0.2		g/kg	
		RPD	Organic Carbon (TOC)	2010/03/22	3.5		%	35
2105702	KGU	QC Standard	Available Aluminum (Al)	2010/03/22		87	%	75 - 125
			Available Arsenic (As)	2010/03/22		104	%	75 - 125
			Available Barium (Ba)	2010/03/22		106	%	75 - 125
			Available Chromium (Cr)	2010/03/22		87	%	75 - 125
			Available Cobalt (Co)	2010/03/22		94	%	75 - 125
			Available Copper (Cu)	2010/03/22		90	%	75 - 125
			Available Iron (Fe)	2010/03/22		91	%	75 - 125
			Available Lead (Pb)	2010/03/22		99	%	75 - 125
			Available Manganese (Mn)	2010/03/22		99	%	75 - 125
			Available Nickel (Ni)	2010/03/22		99	%	75 - 125
			Available Strontium (Sr)	2010/03/22		84	%	75 - 125
			Available Vanadium (V)	2010/03/22		107	%	75 - 125
			Available Zinc (Zn)	2010/03/22		95	%	75 - 125
		Spiked Blank	Available Aluminum (Al)	2010/03/22		104	%	75 - 125
			Available Antimony (Sb)	2010/03/22		101	%	75 - 125
			Available Arsenic (As)	2010/03/22		99	%	75 - 125

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Client Project #: 1215
P.O. #: 300
Project name: GLACE BAY MSSP

Quality Assurance Report (Continued)

Maxxam Job Number: DB032149

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2105702	KGU	Spiked Blank	Available Barium (Ba)	2010/03/22		100	%	75 - 125
			Available Beryllium (Be)	2010/03/22		93	%	75 - 125
			Available Bismuth (Bi)	2010/03/22		98	%	75 - 125
			Available Boron (B)	2010/03/22		90	%	75 - 125
			Available Cadmium (Cd)	2010/03/22		98	%	75 - 125
			Available Chromium (Cr)	2010/03/22		98	%	75 - 125
			Available Cobalt (Co)	2010/03/22		97	%	75 - 125
			Available Copper (Cu)	2010/03/22		97	%	75 - 125
			Available Iron (Fe)	2010/03/22		100	%	75 - 125
			Available Lead (Pb)	2010/03/22		95	%	75 - 125
			Available Lithium (Li)	2010/03/22		91	%	75 - 125
			Available Manganese (Mn)	2010/03/22		111	%	75 - 125
			Available Molybdenum (Mo)	2010/03/22		99	%	75 - 125
			Available Nickel (Ni)	2010/03/22		97	%	75 - 125
			Available Rubidium (Rb)	2010/03/22		99	%	75 - 125
			Available Selenium (Se)	2010/03/22		98	%	75 - 125
			Available Silver (Ag)	2010/03/22		96	%	75 - 125
			Available Strontium (Sr)	2010/03/22		98	%	75 - 125
			Available Thallium (Tl)	2010/03/22		95	%	75 - 125
			Available Tin (Sn)	2010/03/22		104	%	75 - 125
			Available Uranium (U)	2010/03/22		100	%	75 - 125
			Available Vanadium (V)	2010/03/22		105	%	75 - 125
			Available Zinc (Zn)	2010/03/22		96	%	75 - 125
		Method Blank	Available Aluminum (Al)	2010/03/22	ND, RDL=10		mg/kg	
			Available Antimony (Sb)	2010/03/22	ND, RDL=2		mg/kg	
			Available Arsenic (As)	2010/03/22	ND, RDL=2		mg/kg	
			Available Barium (Ba)	2010/03/22	ND, RDL=5		mg/kg	
			Available Beryllium (Be)	2010/03/22	ND, RDL=2		mg/kg	
			Available Bismuth (Bi)	2010/03/22	ND, RDL=2		mg/kg	
			Available Boron (B)	2010/03/22	ND, RDL=5		mg/kg	
			Available Cadmium (Cd)	2010/03/22	ND, RDL=0.3		mg/kg	
			Available Chromium (Cr)	2010/03/22	ND, RDL=2		mg/kg	
			Available Cobalt (Co)	2010/03/22	ND, RDL=1		mg/kg	
			Available Copper (Cu)	2010/03/22	ND, RDL=2		mg/kg	
			Available Iron (Fe)	2010/03/22	ND, RDL=50		mg/kg	
			Available Lead (Pb)	2010/03/22	ND, RDL=0.5		mg/kg	
			Available Lithium (Li)	2010/03/22	ND, RDL=2		mg/kg	
			Available Manganese (Mn)	2010/03/22	ND, RDL=2		mg/kg	
			Available Molybdenum (Mo)	2010/03/22	ND, RDL=2		mg/kg	
			Available Nickel (Ni)	2010/03/22	ND, RDL=2		mg/kg	
			Available Rubidium (Rb)	2010/03/22	ND, RDL=2		mg/kg	
			Available Selenium (Se)	2010/03/22	ND, RDL=1		mg/kg	
			Available Silver (Ag)	2010/03/22	ND, RDL=0.5		mg/kg	
			Available Strontium (Sr)	2010/03/22	ND, RDL=5		mg/kg	
			Available Thallium (Tl)	2010/03/22	ND, RDL=0.1		mg/kg	
			Available Tin (Sn)	2010/03/22	ND, RDL=2		mg/kg	
			Available Uranium (U)	2010/03/22	ND, RDL=0.1		mg/kg	
			Available Vanadium (V)	2010/03/22	ND, RDL=2		mg/kg	
			Available Zinc (Zn)	2010/03/22	ND, RDL=5		mg/kg	
2105887	JPU	QC Standard	Total Carbon-combustion IR	2010/03/22		106	%	75 - 125
		Method Blank	Total Carbon-combustion IR	2010/03/22	ND, RDL=0.2		g/kg	
		RPD	Total Carbon-combustion IR	2010/03/22	2.3		%	35
2106544	SOD	Matrix Spike	D10-Anthracene	2010/03/24		98	%	30 - 130
			D14-Terphenyl	2010/03/24		81	%	30 - 130
			D8-Acenaphthylene	2010/03/24		74	%	30 - 130

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Quality Assurance Report (Continued)

Maxxam Job Number: DB032149

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2106544	SOD	Matrix Spike	1-Methylnaphthalene	2010/03/24		70	%	30 - 130
			2-Methylnaphthalene	2010/03/24		72	%	30 - 130
			Acenaphthene	2010/03/24		79	%	30 - 130
			Acenaphthylene	2010/03/24		73	%	30 - 130
			Anthracene	2010/03/24		87	%	30 - 130
			Benzo(a)anthracene	2010/03/24		85	%	30 - 130
			Benzo(a)pyrene	2010/03/24		92	%	30 - 130
			Benzo(b)fluoranthene	2010/03/24		94	%	30 - 130
			Benzo(g,h,i)perylene	2010/03/24		100	%	30 - 130
			Benzo(k)fluoranthene	2010/03/24		90	%	30 - 130
			Chrysene	2010/03/24		89	%	30 - 130
			Dibenz(a,h)anthracene	2010/03/24		92	%	30 - 130
			Fluoranthene	2010/03/24		79	%	30 - 130
			Fluorene	2010/03/24		76	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2010/03/24		100	%	30 - 130
			Naphthalene	2010/03/24		80	%	30 - 130
			Perylene	2010/03/24		97	%	30 - 130
			Phenanthrene	2010/03/24		80	%	30 - 130
			Pyrene	2010/03/24		81	%	30 - 130
		Spiked Blank	D10-Anthracene	2010/03/24		94	%	30 - 130
			D14-Terphenyl	2010/03/24		89	%	30 - 130
			D8-Acenaphthylene	2010/03/24		76	%	30 - 130
			1-Methylnaphthalene	2010/03/24		77	%	30 - 130
			2-Methylnaphthalene	2010/03/24		80	%	30 - 130
			Acenaphthene	2010/03/24		89	%	30 - 130
			Acenaphthylene	2010/03/24		78	%	30 - 130
			Anthracene	2010/03/24		111	%	30 - 130
			Benzo(a)anthracene	2010/03/24		95	%	30 - 130
			Benzo(a)pyrene	2010/03/24		106	%	30 - 130
			Benzo(b)fluoranthene	2010/03/24		97	%	30 - 130
			Benzo(g,h,i)perylene	2010/03/24		108	%	30 - 130
			Benzo(k)fluoranthene	2010/03/24		111	%	30 - 130
			Chrysene	2010/03/24		103	%	30 - 130
			Dibenz(a,h)anthracene	2010/03/24		78	%	30 - 130
			Fluoranthene	2010/03/24		100	%	30 - 130
			Fluorene	2010/03/24		84	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2010/03/24		107	%	30 - 130
			Naphthalene	2010/03/24		86	%	30 - 130
			Perylene	2010/03/24		112	%	30 - 130
			Phenanthrene	2010/03/24		93	%	30 - 130
			Pyrene	2010/03/24		101	%	30 - 130
		Method Blank	D10-Anthracene	2010/03/24		99	%	30 - 130
			D14-Terphenyl	2010/03/24		80	%	30 - 130
			D8-Acenaphthylene	2010/03/24		71	%	30 - 130
			1-Methylnaphthalene	2010/03/24	ND, RDL=0.005		mg/kg	
			2-Methylnaphthalene	2010/03/24	ND, RDL=0.005		mg/kg	
			Acenaphthene	2010/03/24	ND, RDL=0.005		mg/kg	
			Acenaphthylene	2010/03/24	ND, RDL=0.005		mg/kg	
			Anthracene	2010/03/24	ND, RDL=0.005		mg/kg	
			Benzo(a)anthracene	2010/03/24	ND, RDL=0.005		mg/kg	
			Benzo(a)pyrene	2010/03/24	ND, RDL=0.005		mg/kg	
			Benzo(b)fluoranthene	2010/03/24	ND, RDL=0.005		mg/kg	
			Benzo(g,h,i)perylene	2010/03/24	ND, RDL=0.005		mg/kg	
			Benzo(k)fluoranthene	2010/03/24	ND, RDL=0.005		mg/kg	
			Chrysene	2010/03/24	ND, RDL=0.005		mg/kg	

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Quality Assurance Report (Continued)

Maxxam Job Number: DB032149

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2106544	SOD	Method Blank	Dibenz(a,h)anthracene	2010/03/24	ND, RDL=0.005		mg/kg	
			Fluoranthene	2010/03/24	ND, RDL=0.005		mg/kg	
			Fluorene	2010/03/24	ND, RDL=0.005		mg/kg	
			Indeno(1,2,3-cd)pyrene	2010/03/24	ND, RDL=0.005		mg/kg	
			Naphthalene	2010/03/24	ND, RDL=0.005		mg/kg	
			Perylene	2010/03/24	ND, RDL=0.005		mg/kg	
			Phenanthrene	2010/03/24	ND, RDL=0.005		mg/kg	
			Pyrene	2010/03/24	ND, RDL=0.005		mg/kg	
		RPD	1-Methylnaphthalene	2010/03/24	NC		%	50
			2-Methylnaphthalene	2010/03/24	NC		%	50
			Acenaphthene	2010/03/24	21.3		%	50
			Acenaphthylene	2010/03/24	NC		%	50
			Anthracene	2010/03/24	NC		%	50
			Benzo(a)anthracene	2010/03/24	NC		%	50
			Benzo(a)pyrene	2010/03/24	NC		%	50
			Benzo(b)fluoranthene	2010/03/24	NC		%	50
			Benzo(g,h,i)perylene	2010/03/24	NC		%	50
			Benzo(k)fluoranthene	2010/03/24	NC		%	50
			Chrysene	2010/03/24	NC		%	50
			Dibenz(a,h)anthracene	2010/03/24	NC		%	50
			Fluoranthene	2010/03/24	56.5 (1)		%	50
			Fluorene	2010/03/24	31.6		%	50
			Indeno(1,2,3-cd)pyrene	2010/03/24	NC		%	50
			Naphthalene	2010/03/24	NC		%	50
			Perylene	2010/03/24	NC		%	50
			Phenanthrene	2010/03/24	31.2		%	50
			Pyrene	2010/03/24	49.3		%	50
2106619	JPU	QC Standard	Organic Carbon (TOC)	2010/03/23		101	%	75 - 125
		Method Blank	Organic Carbon (TOC)	2010/03/23	ND, RDL=0.2		g/kg	
		RPD	Organic Carbon (TOC)	2010/03/23	2.5		%	35
2107501	LGA	Matrix Spike	2,4,5,6-Tetrachloro-m-xylene	2010/03/25		58	%	40 - 130
			Decachlorobiphenyl	2010/03/25		88	%	40 - 130
			o,p-DDD	2010/03/25		92	%	40 - 130
			p,p-DDD	2010/03/25		94	%	40 - 130
			o,p-DDE	2010/03/25		85	%	40 - 130
			p,p-DDE	2010/03/25		103	%	40 - 130
			o,p-DDT	2010/03/25		90	%	40 - 130
			p,p-DDT	2010/03/25		86	%	40 - 130
		Spiked Blank	2,4,5,6-Tetrachloro-m-xylene	2010/03/25		79	%	40 - 130
			Decachlorobiphenyl	2010/03/25		88	%	40 - 130
			o,p-DDD	2010/03/25		97	%	40 - 130
			p,p-DDD	2010/03/25		102	%	40 - 130
			o,p-DDE	2010/03/25		87	%	40 - 130
			p,p-DDE	2010/03/25		103	%	40 - 130
			o,p-DDT	2010/03/25		97	%	40 - 130
			p,p-DDT	2010/03/25		98	%	40 - 130
		RPD	Total PCB	2010/03/25	NC		%	50
			Aroclor 1242	2010/03/25	NC		%	50
		Method Blank	2,4,5,6-Tetrachloro-m-xylene	2010/03/25		81	%	40 - 130
			Decachlorobiphenyl	2010/03/25		86	%	40 - 130
			Aroclor 1262	2010/03/25	ND, RDL=0.02		ug/g	
			Aroclor 1268	2010/03/25	ND, RDL=0.02		ug/g	
			o,p-DDD	2010/03/25	ND, RDL=0.002		ug/g	
			p,p-DDD	2010/03/25	ND, RDL=0.002		ug/g	
			o,p-DDD + p,p-DDD	2010/03/25	ND, RDL=0.002		ug/g	

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Stantec Consulting Ltd
Attention: Kelley Fraser
Client Project #: 1215
P.O. #: 300
Project name: GLACE BAY MSSP

Quality Assurance Report (Continued)

Maxxam Job Number: DB032149

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2107501	LGA	Method Blank	o,p-DDE	2010/03/25	ND, RDL=0.002		ug/g	
			p,p-DDE	2010/03/25	ND, RDL=0.002		ug/g	
			o,p-DDE + p,p-DDE	2010/03/25	ND, RDL=0.002		ug/g	
			o,p-DDT	2010/03/25	ND, RDL=0.002		ug/g	
			p,p-DDT	2010/03/25	ND, RDL=0.002		ug/g	
			o,p-DDT + p,p-DDT	2010/03/25	ND, RDL=0.002		ug/g	
			DDT+ Metabolites	2010/03/25	ND, RDL=0.002		ug/g	
			Total PCB	2010/03/25	ND, RDL=0.03		ug/g	
			Aroclor 1016	2010/03/25	ND, RDL=0.02		ug/g	
			Aroclor 1221	2010/03/25	ND, RDL=0.03		ug/g	
			Aroclor 1232	2010/03/25	ND, RDL=0.02		ug/g	
			Aroclor 1242	2010/03/25	ND, RDL=0.02		ug/g	
			Aroclor 1248	2010/03/25	ND, RDL=0.02		ug/g	
			Aroclor 1254	2010/03/25	ND, RDL=0.02		ug/g	
			Aroclor 1260	2010/03/25	ND, RDL=0.02		ug/g	
		RPD	p,p-DDD	2010/03/25	NC		%	50
			p,p-DDE	2010/03/25	NC		%	50
			p,p-DDT	2010/03/25	NC		%	50
			Aroclor 1016	2010/03/25	NC		%	50
			Aroclor 1221	2010/03/25	NC		%	50
			Aroclor 1232	2010/03/25	NC		%	50
			Aroclor 1248	2010/03/25	NC		%	50
			Aroclor 1254	2010/03/25	NC		%	50
			Aroclor 1260	2010/03/25	NC		%	50
2108866	BAN	RPD	< -4 Phi (16 mm)	2010/03/25	0		%	25
			< -3 Phi (8 mm)	2010/03/25	0		%	25
			< -2 Phi (4 mm)	2010/03/25	0		%	25
			< -1 Phi (2 mm)	2010/03/25	3.0		%	25
			< 0 Phi (1 mm)	2010/03/25	11.5		%	25
			< +1 Phi (0.5 mm)	2010/03/25	31.9 (2)		%	25
			< +2 Phi (0.25 mm)	2010/03/25	6.7		%	25
			< +3 Phi (0.12 mm)	2010/03/25	2.0		%	25
			< +4 Phi (0.062 mm)	2010/03/25	0.2		%	25
			< +5 Phi (0.031 mm)	2010/03/25	2.4		%	25
			< +6 Phi (0.016 mm)	2010/03/25	0.3		%	25
			< +7 Phi (0.0078 mm)	2010/03/25	16.0		%	25
			< +8 Phi (0.0039 mm)	2010/03/25	4.1		%	25
			< +9 Phi (0.0020 mm)	2010/03/25	10.2		%	25
			Gravel	2010/03/25	3.9		%	25
			Sand	2010/03/25	3.1		%	25
			Silt	2010/03/25	NC		%	25
			Clay	2010/03/25	4.1		%	25
2108869	VRO	Matrix Spike	Chromium (VI)	2010/03/26		8.8 (3)	%	75 - 125
		QC Standard	Chromium (VI)	2010/03/26		90	%	85 - 115
		Spiked Blank	Chromium (VI)	2010/03/26		102	%	75 - 125
		Method Blank	Chromium (VI)	2010/03/26	ND, RDL=0.2		ug/g	
		RPD	Chromium (VI)	2010/03/26	NC		%	35
2109935	MYG	RPD	Moisture	2010/03/26	1.6		%	50
2110944	JRC	Matrix Spike	Mercury (Hg)	2010/03/29		NC	%	75 - 125
		QC Standard	Mercury (Hg)	2010/03/29		80	%	N/A
		Spiked Blank	Mercury (Hg)	2010/03/29		80	%	N/A
		Method Blank	Mercury (Hg)	2010/03/29	ND, RDL=0.01		mg/kg	
		RPD	Mercury (Hg)	2010/03/29	0.5		%	35

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

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Quality Assurance Report (Continued)

Maxxam Job Number: DB032149

QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) Duplicate: < 10 % of compounds in multi-component analysis in violation.
(2) %RPD criteria not applicable for individual PHI fractions.
(3) The recovery was below the lower control limit. This may be due in part to the reducing environment of the sample.

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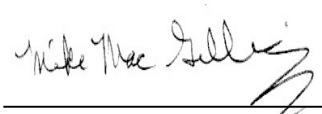
Validation Signature Page

Maxxam Job #: B032149

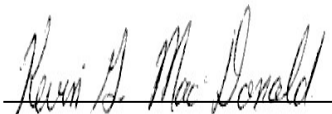
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

ALINA SEGAL, Manager Main Lab - Organics

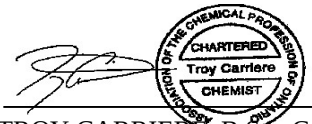
COLLEEN ACKER,



MIKE MACGILLIVRAY, Bedford Inorg Spvsr



KEVIN MACDONALD, Inorganics Supervisor



TROY CARRIERE, B.Sc., C.Chem, Scientific Specialist

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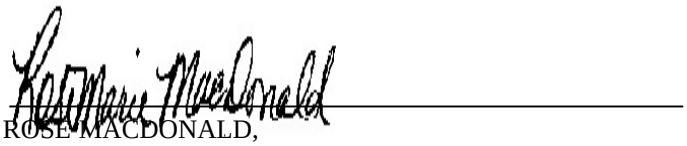

ROSE MACDONALD,

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