
Public Works and Government Services Canada
Basin Dredging
Pinkney's Point SCH
Yarmouth County, N.S.
R.112118.001

Appendix A
Historical MSSP Pinkney's Point SCH



CBCL LIMITED
Consulting Engineers

**PWGSC PROJECT #R.056889.022
MARINE SEDIMENT SAMPLING PROGRAM
Pinkneys Point Small Craft Harbour
Pinkneys Point, Nova Scotia**

FINAL REPORT

Submitted to:
Public Works and Government Services Canada
1713 Bedford Row
Halifax, Nova Scotia
B3J 1T3

Submitted by:
CBCL Limited
1489 Hollis Street
Halifax, Nova Scotia
B3J 2R7

March 28, 2013

CBCL Project #131203.03



28 March 2013

Ms. Tamara McFarland
Public Works and Government Services Canada
PO Box 2247
Halifax, NS B3J 3C9

Dear Ms. McFarland:

RE: Marine Sediment Sampling Program, Pinkneys Point Small Craft Harbour, Yarmouth County, Nova Scotia – Final Report

CBCL Limited is pleased to provide Public Works and Government Services Canada with the attached Marine Sediment Sampling Program undertaken at the *Pinkneys Point Small Craft Harbour, Yarmouth County, Nova Scotia*.

Please feel free to contact the undersigned at your convenience, if you have any questions or require additional information. We appreciate having the opportunity to work with you.

Yours very truly,

CBCL Limited

Jason Bernier, P. Eng
Senior Environmental Assessment Contact
Direct: (902) 492-6744
E-Mail: jbernier@cbcl.ca

Attachments

File: 131203.03

1489 Hollis Street

PO Box 606

Halifax, Nova Scotia

Canada B3J 2R7

Telephone: 902 421 7241

Fax: 902 423 3938

E-mail: info@cbcl.ca

www.cbcl.ca

**Solving
today's
problems
with
tomorrow
in mind**

ISO 9001
Registered Company

EXECUTIVE SUMMARY

Five surface sediment samples were collected from Pinkneys Point, DFO SCH. The samples were submitted to Maxxam Analytics for detailed analyses. Results were compared to the Canadian Environmental Protection Act (CEPA) Disposal at Sea Regulations, CCME Soil Quality Guidelines (SQGs) for the Protection of Environment and Human Health in agricultural, residential/parkland, commercial/industrial applications, Atlantic Risk-Based Corrective Action (RBCA) Tier 1 Version 3.0 Risk-Based Screening Levels (RBSLs), Canadian Drinking Water Quality Guidelines (CDWQG), and CCME Water Quality Guidelines (WQGs).

The analytical results of the five samples collected from the Pinkneys Point DFO-SCH indicate no exceedances of Atlantic RBCA Tier 1, Version 3.0 RBSLs. Exceedances of the CCME agricultural SQGs were noted for hot water soluble boron in all samples. Exceedances of CCME SQGs for the Protection of Freshwater Aquatic Life were noted for PAHs in Samples SS-P07, SS-P24 and SS-P35. Exceedances of CCME SQG for agricultural land use were noted for PAHs in samples SS-P07, SS-P16 and SS-P35. An exceedance of the CEPA Disposal at Sea Chemical Screening Criteria for total PAH was noted in sample SS-P07. An exceedance of CCME SQGs Index of Added Cancer Risk (IACR) for drinking water quality was noted for PAH in sample SS-P07. An Exceedance of CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life was noted for PAH leachate in sample SS-P07.

Table ES1 Exceedance Table

Parameter/Guideline	Sample ID				
	SS-P07	SS-P16	SS-P24	SS-P25	SS-P35
CEPA Disposal at Sea	●	-	-	-	-
CCME Soil Quality Guidelines					
PAHs	●	●	●	-	●
Metals	●	●	●	●	●
PCBs	-	-	-	-	-
DDT	-	-	-	-	-
Atlantic RBCA Tier 1 Version 3.0 RBSLs	-	-	-	-	-
CCME Water Quality Guidelines (SPLP Leachate)					
PAHs	●	NA	NA	NA	NA
Canadian Guidelines for Drinking Water Quality (SPLP Leachate)					
PAHs	-	NA	NA	NA	NA

- No Exceedance
- Exceedance

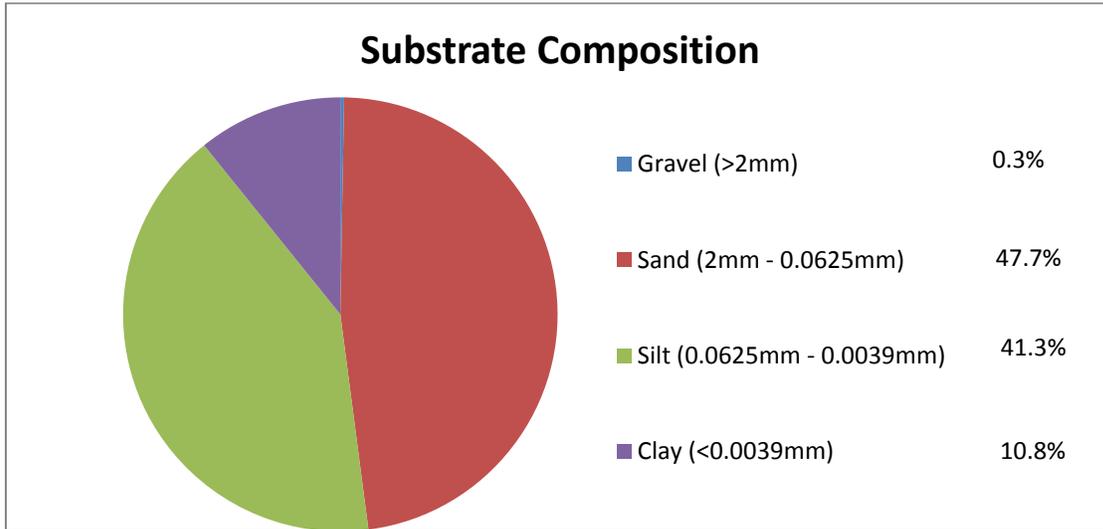


Figure ES1 Averaged Substrate Composition

TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION	1
2.0 SCOPE AND METHODOLOGY	1
2.1 SITE PLAN	1
2.2 SAMPLE COLLECTION.....	1
3.0 BENTHIC PHOTOGRAPH INTERPRETATION	3
4.0 ANALYTICAL RESULTS	4
4.1 PAH CONCENTRATIONS	4
4.2 METAL CONCENTRATIONS.....	6
4.3 PETROLEUM HYDROCARBON CONCENTRATIONS.....	6
4.4 PCB CONCENTRATIONS	7
4.5 DDT CONCENTRATIONS	7
4.6 CARBON CONTENT	7
4.7 GRAIN SIZE DISTRIBUTION.....	7
5.0 QUALITY ASSURANCE/QUALITY CONTROL	8
6.0 CONCLUSION	9
7.0 CLOSING.....	9

TABLE OF CONTENTS (cont'd)

PAGE

LIST OF TABLES

Table ES1	Exceedance Table	i
Table 2.1	Sample Coordinates.....	3
Table 4.1	Dominant Sediment Types at Each Sample Location	8

LIST OF FIGURES

Figure ES1	Averaged Substrate Composition.....	ii
Figure 2.1	Field Sampling Locations, Pinkneys Point, January 28, 2013.....	2
Figure 4.1	Average Substrate Composition.....	7

LIST OF APPENDICES

Appendix A	MSSP Field Report and Photo Log
Appendix B	Analytical Summary Tables
Appendix C	QA/QC, COC, and Laboratory Certificates of Analyses
Appendix D	Limitations

1.0 INTRODUCTION

At the request of Public Works and Government Services Canada (PWGSC), five stations were sampled within the footprint of the proposed dredging area at the Pinkneys Point DFO-SCH on January 28, 2013.

2.0 SCOPE AND METHODOLOGY

2.1 Site Plan

The selection of sample stations followed guidance provided in the Environmental Protection Series: *Users Guide to the Application Form for Ocean Disposal* (Report EPS 1/MA/1 December 1995), whereby a random approach was implemented for the location of sampling stations in the proposed dredging area of the SCH. The unstratified area was divided into square blocks where at least five times as many blocks as the number of stations required was used. An online random number generator program (www.random.org) was then used to derive the sampling locations within the proposed dredge area (Figure 2.1).

A detailed program design was prepared by CBCL Limited and submitted to PWGSC on January 15, 2013 for review and approval prior to field program implementation. The field program was scheduled upon acceptance of the design.

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. The sediment samples were collected by Connors Diving Limited. The sample collection field program was completed in accordance with guidelines defined by provincial Occupational Health and Safety Standards.

2.2 Sample Collection

The marine sediment samples were collected by Connors Diving as close as possible to the selected sampling stations. A handheld Garmin Global Positioning System (GPS) was used to georeference the sampling location coordinates that were derived prior to field program initiation. Connors Diving was able to retrieve sample at all stations and no discrepancy in sample station coordinates were reported. The coordinates are listed in Section 2.3. MSSP field reports that were completed in the field during the sampling program are listed in Appendix A.

Figure 2.1 Field Sampling Locations, Pinkneys Point, January 28, 2013



In order to facilitate the determination of all disposal options, the analytical sample results were compared to the following:

- *Canadian Environmental Protection Act (CEPA) Disposal at Sea Regulations* (formerly the Ocean Dumping Control Act) – Lower Level Chemical screening criteria;
- CCME Soil Quality Guidelines (SQGs) for the Protection of Environment and Human Health in agricultural, residential/parkland, and commercial/industrial applications;
- Atlantic Risk-Based Corrective Action (RBCA) Tier 1 Version 3.0 Risk-Based Screening Levels (RBSLs); and
- Canadian Drinking Water Quality Guidelines (applied to SPLP leachate results).
- CCME Water Quality Guidelines (applied to SPLP leachate results).

Table 2.1 Sample Coordinates

Sample ID	Sample Coordinates (UTM, NAD 83)	
	Easting	Northing
SS-P07	253981.99	4843566.99
SS-P16	253999.07	4843557.54
SS-P24	253981.59	4843499.91
SS-P25	254021.78	4843557.76
SS-P35	254021.30	4843535.41

3.0 BENTHIC PHOTOGRAPH INTERPRETATION

On January 28, 2013, CBCL Limited commissioned Connors Diving Services Limited (Connors) to collect sediment samples and underwater photographs at five locations at Pinkneys Point Harbour in Yarmouth County. Underwater photographs were collected at each sample station for benthic habitat characterization. The diving survey was carried out by Canadian Standards Association and Diver Certification Board of Canada certified divers using surface-supplied breathing apparatus. The positioning at each location was determined at the surface prior to each dive using a handheld Global Positioning System (GPS). The locations (SS-P07, SS-P16, SS-P24, SS-P25, SS-P35) are identified in Figure 2.1. Summaries of findings at each location are provided below and photographs of benthic habitat are attached in Appendix A.

Station SS-P07 (Appendix A – Photos 1-3)

Numerous macroalgae, attached and lying as debris on the bottom, were observed in the photographs of samples station SS-P07. Sediment appears to be silty sand. No fauna was identified in the photographs. Flora consisted of what appears to be attached rock weed (*Fucus sp.* possibly *Fucus serratus* and/or *Fucus vesiculosus*), knotted wrack (*Ascophyllum nodosum*), debris of kelp (*Laminaria sp.*) and green (live) and brown (dead) stems of eel grass (*Zostera marina*).

Station SS-P16 (Appendix A – Photos 4-6)

Station SS-P16 is characterized by an exposed sandy sediment with ripples in certain areas and accumulation of plant debris completely covering the substrate in other areas. Fauna was not observed on photographs at this site. Flora consisted of debris lying on the bottom composed mostly of rock weed (*Fucus sp.* possibly *Fucus serratus* or *Fucus vesiculosus*), knotted wrack (*Ascophyllum nodosum*), and numerous stems of dead eel grass (*Zostera marina*).

Station SS-P24 (Appendix A – Photos 7-9)

Station SS-P24 is located at the entrance of the harbour. Bottom substrate consisted of silty sand sediment. No fauna was observed on photographs at this site. Flora consisted of floating debris from rock weed (*Fucus sp.* possibly *Fucus serratus* or *Fucus vesiculosus*), kelp (*Laminaria sp.*), knotted wrack (*Ascophyllum nodosum*) and stems of dead eel grass (*Zostera marina*).

Station SS-P25 (Appendix A – Photos 10-12)

Station SS-P25 is located alongside the outside off the northern wharf structure. No fauna was observed in the photographs. Substrate consisted of silty sand sediment with abundant plant debris floating above it. Flora consisted mostly of debris from rock weed (*Fucus sp.* possibly *Fucus serratus* and/or *Fucus vesiculosus*), kelp (*Laminaria sp.*), knotted wrack (*Ascophyllum nodosum*) and numerous stems of dead eel grass (*Zostera marina*).

Station SS-P35 (Appendix A – Photos 13-15)

SS-P35 is located 10 m out from the outside of the northern wharf. The substrate is made up of sand ripples with fine plant debris accumulated in the troughs. Fauna was not observed in any of the photographs. Flora is limited to fine floating debris of unidentified algae and a few stems of dead eel grass (*Zostera marina*).

4.0 ANALYTICAL RESULTS

The analytical results of the marine sediment samples collected and analyzed from Pinkneys Point SCH are summarized in Tables B.1 to B.6 (Appendix B) and discussed below. It was decided through consultation with PWGSC that sample SS-P07 would undergo leachate analysis (Synthetic Precipitation Leaching Procedure [SPLP]; EPA Method 1312) for PAHs. The complete set of analytical results, including laboratory QA/QC and Certificates of Analyses for all parameters tested, are provided in Appendix C.

4.1 PAH Concentrations

Total PAH levels are regulated at a value of less than or equal to 2.5 mg per kilogram (mg/kg) under CEPA in order to meet ocean disposal criteria. The CCME SQGs for the protection of human and environmental health stipulate guideline values for individual PAH compounds as well as the sum of individual PAH compounds for the calculation of Index of Additive Cancer

Risk (IACR). A summary of the results compared to each of the referenced guidelines is provided in the following subsections.

CEPA Disposal at Sea Chemical screening criteria

Analytical results for sample SS-P07 exceeded the CEPA Disposal at Sea Chemical Screening Criteria for Total PAHs (Table B.1).

CCME SQGs – Human Health (Potable Water)

Analytical results for sample SS-P07 exceeded the CCME IACR (Drinking Water Check) value of 1.

CCME SQGs – 1991 Interim Soil Quality Guidelines

Analytical results for sample SS-P07, SS-P16, and SS-P35 exceeded the CCME SQGs for pyrene for agricultural land use. Analytical results for sample SS-P03 also exceeded the CCME SQGs for benzo(a)anthracene and phenanthrene for agricultural land use (Table B.1).

CCME SQG – Human Health (Direct Contact)

Guidance provided in the CCME Soil Quality Guidelines for the Protection of Environmental and Human Health (2008) indicates that for soil contaminated by coal tar or creosote mixtures, the calculated Benzo(a)pyrene TPE concentration for soil samples should be multiplied by an uncertainty factor (UF) of 3 prior to comparison with the SQGs for the protection of human health (direct contact) to account for carcinogenic potential of alkylated and other PAHs present for which a PEF does not currently exist, but which are likely to contribute to mixture carcinogenic potential.

When Creosote is detected an uncertainty factor of 3 is multiplied to the calculated Benzo(a)pyrene total potency equivalent concentration prior to comparison with the SQG's for the protection of human health. Analytical results from the open flame ionization detector (FID) scan revealed that creosote was not detected for any of the samples analyzed. Results of all samples fell below the CCME SQGs for the protection of human health direct contact (Table B.1).

CCME SQGs – Environmental Health (Soil Contact), (Soil and Food Ingestion), and (Freshwater Life)

No samples exceeded the CCME SQGs for the protection of environmental health (soil contact) and (soil and food ingestion).

Analytical results for samples SS-P07, SS-P24, and SS-P35 exceeded the CCME SQGs for the protection of environmental health (freshwater aquatic life) for phenanthrene (Table B.1).

CCME WQGs – Aquatic Life (Freshwater and Marine)

Samples SS-P07 was submitted for SPLP leachate analysis. Analytical results for sample SS-P07 exceeded CCME WQGs for the Protection of Freshwater Aquatic Life for anthracene, fluoranthrene, and Pyrene (Table B.2).

Health Canada CGDWQ

Analytical results for sample SS-P07 did not exceed Health Canada's CGDWQ Maximum Acceptable Concentration for any PAH compounds (Table B.2).

Leachate from Sample SS-P07 was below the CCME IACR (Drinking Water Check) value of 1.

4.2 Metal Concentrations

Sample results were compared to the established CEPA Disposal at Sea Chemical Screening Criteria and the former Environment Canada Interim Rejection Limits. The results were also compared to the CCME SQGs for agricultural, residential/parkland and commercial/industrial applications for land disposal.

CEPA Disposal at Sea Chemical screening criteria

No samples exceeded the CEPA Disposal at Sea Chemical Screening Criteria (Table B.3).

CCME Soil Quality Guidelines

Analytical results for all samples exceeded CCME SQGs for agricultural applications for hot water soluble boron (Table B.3).

4.3 Petroleum Hydrocarbon Concentrations

Although no federal guidelines for petroleum hydrocarbons currently exist for marine sediment, the analytical BTEX results of the three samples collected were compared to the Atlantic RBCA Tier 1 Version 3.0 RBSLs and CCME SQGs for various land use applications. Silica gel clean-up was requested and completed prior to analysis.

Modified TPH values reflect the sum of the individual carbon fractions that resembles gasoline, diesel #2, and lube oil. Based on the resemblance results provided by the laboratory, the analytical results for Modified TPH were compared against the corresponding Atlantic RBCA Tier 1 Version 3.0 RBSLs.

BTEX was not detected in any of the samples collected (Table B.4).

The modified TPH values for all samples were below detection and did not exceed the Atlantic RBCA Tier 1 Version 3.0 RBSLs.

4.4 PCB Concentrations

Total PCB values are regulated at a value of less than or equal to 0.1 mg/kg under CEPA in order to meet ocean disposal criteria. The CCME SQGs for PCBs in agricultural, residential/parkland, and industrial/commercial applications are regulated at values of 0.5, 1.3, and 33.0 mg/kg, respectively.

No samples exceeded the CEPA Disposal at Sea Chemical Screening Criteria or the CCME SQGs (Table B.5).

4.5 DDT Concentrations

Total DDT which refers to the sum of DDE, DDD, and DDT concentrations is regulated under the CCME SQGs for agricultural, residential/parkland, and commercial/industrial applications at values of 0.7, 0.7, and 12 mg/kg, respectively.

No samples exceeded the CCME SQGs for DDE DDD and DDT (Table B.5).

4.6 Carbon Content

The five samples showed total carbon contents ranging from 7.9 to 28 grams per kilogram (g/kg). TOC was the predominant type, ranging from 4 to 26 g/kg, while TIC ranged from 1.8 to 6.9 g/kg (Table B.6).

4.7 Grain Size Distribution

Sediment composition is described in Figure 4.1 and Table 4.1 below. Figure 4.1 illustrates the average substrate composition within the proposed dredge area. Table 4.1 breaks down the sediment composition at each sampling location.

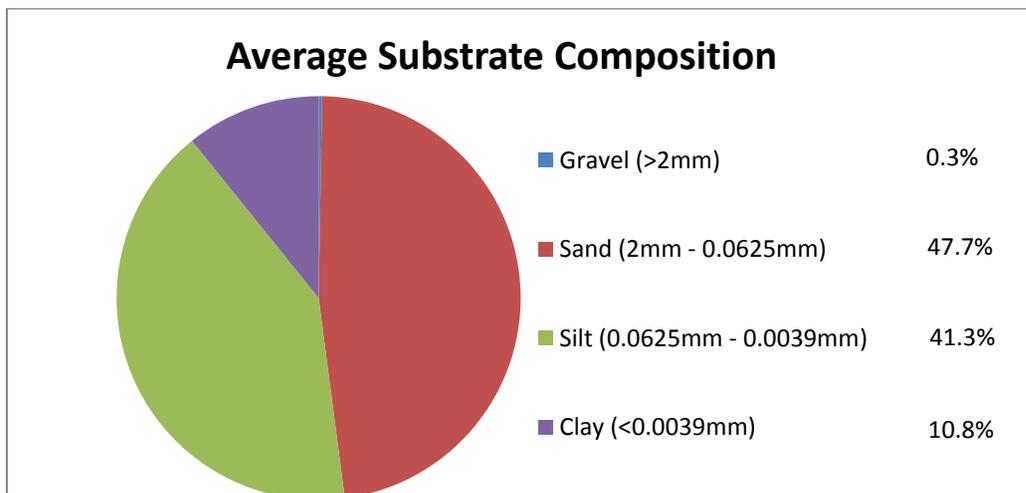


Figure 4.1 Average Substrate Composition

Table 4.1 Dominant Sediment Types at Each Sample Location

Sediment Distribution				
Sample ID	Primary Substrate	Secondary Substrate	Tertiary Substrate	Quaternary Substrate
SS-P07	Silt	Sand	Clay	Gravel
SS-P16	Sand	Silt	Clay	Gravel
SS-P24	Silt	Clay	Sand	Gravel
SS-P25	Sand	Silt	Clay	Gravel
SS-P35	Sand	Silt	Clay	Gravel

5.0 QUALITY ASSURANCE/QUALITY CONTROL

All samples collected were labelled on site using 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, and were hand-delivered to the laboratory following program completion. A copy of the Chain of Custody (COC) that accompanied the samples is provided in Appendix C. Additional samples were collected to safeguard against loss or damage during transport, and will be stored and refrigerated until the final report is received by PWGSC.

Sample collection, preparation, and analyses followed guidance provided in the afore-referenced Environment Canada document. Samples were analyzed by an accredited laboratory with CALA and/or ISO/IEC 17025 and are certified by the Standards Council of Canada (SCC) for each selected chemical analyses of this program. The complete set of analytical results, including laboratory QA/QC and Certificates of Analyses for all parameters tested, are provided in Appendix C.

The laboratory undertakes internal duplicate analyses for QA/QC purposes. Laboratory duplicate analyses were performed for PAH, Metals, BTEX TPH, Total Carbon, Grain Size, and PCB to meet internal QA/QC objectives for the Pinkneys Point samples submitted. Discrepancies were noted by the laboratory for the analyses performed. PAH duplicates were outside of acceptable limits for multiple PAH parameters. The discrepancy in duplicate results can be attributed to the low level analysis and inhomogeneity of the samples.

To assess the quality of the analytical data, a review of the internal laboratory QA/QC results was completed and included a review of laboratory duplicate analyses, method blanks, surrogates, spike samples, and QA/QC standards. The following information applicable to this MSSP report's findings was noted:

- Duplicate: results are outside acceptance limit. Analysis was repeated with similar results; and
- The recovery was above the upper control limit. This may represent a high bias in some results for this specific analyte. For results that were not detected (ND), this potential bias has no impact.

The QA/QC comments from the laboratory were accounted for in the review of the results. The analytical results were able to be compared to all applicable guidelines outlined in the Statement of Work.

A senior reviewer from CBCL Limited has reviewed this report prior to its release. The limitations of this document are provided in Appendix D.

6.0 CONCLUSION

The analytical results of the five samples collected from the Pinkneys Point DFO-SCH indicate no exceedances of Atlantic RBCA Tier 1, Version 3.0 RBSLs. Exceedances of the CCME agricultural SQGs were noted for hot water soluble boron in all samples. Exceedances of CCME SQGs for the Protection of Freshwater Aquatic Life were noted for PAHs in Samples SS-P07, SS-P24 and SS-P35. Exceedances of CCME SQG for agricultural land use were noted for PAHs in samples SS-P07, SS-P16 and SS-P35. An exceedance of the CEPA Disposal at Sea Chemical Screening Criteria for total PAH was noted in sample SS-P07. An exceedance of CCME SQGs Index of Added Cancer Risk (IACR) for drinking water quality was noted for PAH in sample SS-P07. An Exceedance of CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life was noted for PAH leachate in sample SS-P07.

7.0 CLOSING

This document has been prepared and reviewed by the following people:

Prepared by:



Peter Lane, EIT
Assessor

Reviewed by:



Brad Trask, P.Eng.
Senior Reviewer

**APPENDIX A
MSSP Field Report
and
Photo Log**

MSSP FIELD REPORT

Site: Pinkneys Point	Location: Yarmouth, NS	Date: Jan 28 / 2013
Sample Collector: Matt Whalen	Time: 1200	
Recorder: Cole Scarfe	Average Water Temperature (°C):	
Collection Device: Clean Bucket	Type of Vessel: Small ZODIAC	

Site Description		
Air Temperature: -9 °C □ °F	Weather: Sunny, windy	Photographs Taken: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Site Conditions: High wind.		
Observations: - lots of boat activity - all persons @ location were notified of diving.		

Sample Data					
Sample ID	Sediment Description ¹	Odour ²	Grab Depth (cm)	Flora/Fauna	Latitude and Longitude ³
SS-P07	Soft Clay	low Sulfur	10-12"		
SS-P16	Soft Clay	low Sulfur	10-12"		
SS-P24	Thick clay	low Sulfur	10-12"		
SS-P25	Sand	low Sulfur	8-10"	Sea Grass	
SS-P35	Sand	low Sulfur	8-10"		

Additional Comments
- Control points were verified.
- Sample P35 was retrieved by Jars individually due to displacement.

Notes:
1. Sediment colour, gradient type, sediment type, texture and consistency, colour, presence of biota
2. Degree of odour (strong, slight, none)
3. Decimal degrees (DDD.dddd)

Photo 1 – Pinkneys Point SS-P07



Photo 2 - Pinkneys Point SS-P07



Photo 3 - Pinkneys Point PP07



Photo 4 - Pinkneys Point SS-P16



Photo 5 - Pinkneys Point SS-P16



Photo 6 - Pinkneys Point SS-P16



Photo 7- Pinkneys Point SS-P24



Photo 8 - Pinkneys Point SS-P24



Photo 9 - Pinkneys Point SS-P24



Photo 10 - Pinkneys Point SS-P25



Photo 11 - Pinkneys Point SS-P25



Photo 12 - Pinkneys Point SS-P25



Photo 13 – Pinkneys Point SS-P35

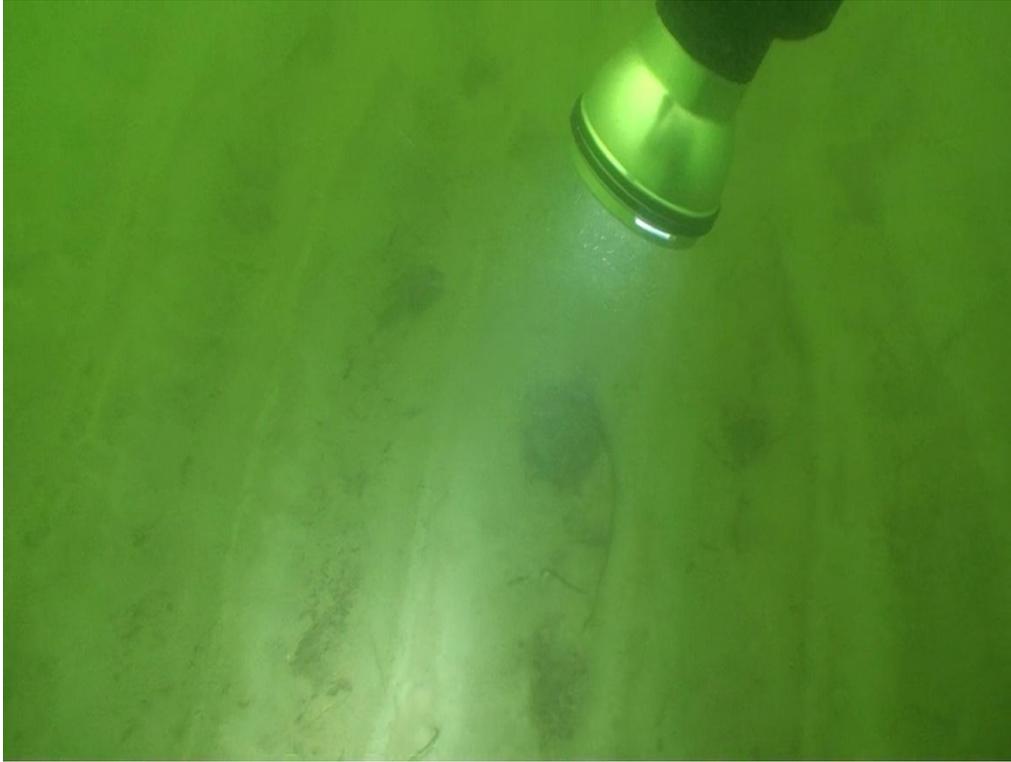


Photo 14 – Pinkneys Point SS-P35

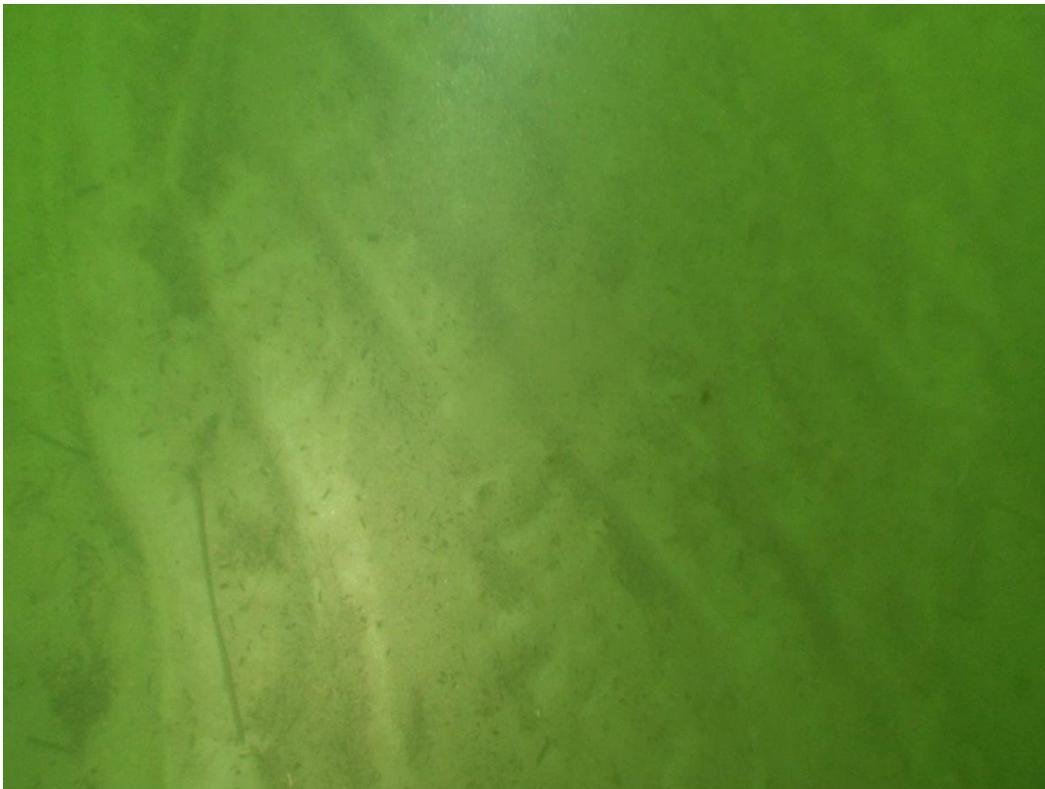


Photo 15 – Pinkneys Point SS-P35



APPENDIX B

Analytical Summary Tables

Table B.1 - PAH Results for Marine Sediments- Pinkneys Point DFO-SCH, Yarmouth County, Nova Scotia

Parameter	RDL	Units	Sample Identification and Date						CEPA Disposal at Sea Guidelines	CCME Sediment Quality Guidelines		CCME Soil Quality Guidelines								
			SS-P07	SS-P07 Lab-Dup	SS-P16	SS-P24	SS-P25	SS-P35		Interim Sediment Quality Guidelines	Marine and Estuarine Probable Effects Levels	Human Health		Environmental Health				Interim Soil Quality Criteria		
			28-Jan-13									Potable Water ¹	Direct Contact	Soil Contact		Soil and Food Ingestion	Freshwater Life	Agricultural Use	Residential/ Parkland Land Uses	Commerical/ Industrial Land Uses
			Agricultural, Residential/ Parkland, Commerical and Industrial Land Uses	Agricultural, Residential/ Parkland, Commerical and Industrial Land Uses	Agricultural, Residential/ Parkland Land Uses	Commerical/ Industrial Land Uses	Agricultural, Residential/ Parkland Land Uses	Agricultural, Residential/ Parkland, Commerical and Industrial Land Uses												
Polycyclic Aromatic Hydrocarbon (PAH) Results																				
1-Methylnaphthalene	0.005	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-	-	-	-	-	-	-	-	
2-Methylnaphthalene	0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	0.0202	0.201	-	-	-	-	-	-	-	-	
Acenaphthene	0.005		<i>0.023</i>	<i>0.018</i>	<i>0.0087</i>	<i>0.018</i>	<0.0050	<0.0050	-	0.00671	0.0889	-	-	-	21.5	0.28	-	-	-	
Acenaphthylene	0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	0.00587	0.128	-	-	-	-	320	-	-	-	
Anthracene	0.005		<i>0.12</i>	<i>0.018</i>	<i>0.023</i>	<i>0.033</i>	<0.0050	<i>0.03</i>	-	0.0769	0.245	-	-	2.5	32	61.5	-	-	-	
Benzo(a)anthracene	0.005		<i>0.17</i>	<i>0.043 (1)</i>	<i>0.057</i>	<i>0.048</i>	<i>0.018</i>	<i>0.049</i>	-	0.0748	0.693	-	-	-	-	6.2	-	0.1	1	10
Benzo(a)pyrene	0.005		<i>0.076</i>	<i>0.026 (1)</i>	<i>0.03</i>	<i>0.035</i>	<i>0.016</i>	<i>0.035</i>	-	0.0888	0.763	-	-	20	72	0.6	8800	0.7	0.7	1.4
Benzo(b)fluoranthene	0.005		<i>0.083</i>	<i>0.035 (1)</i>	<i>0.035</i>	<i>0.046</i>	<i>0.026</i>	<i>0.033</i>	-	-	-	-	-	-	-	6.2	-	0.1	1	10
Benzo(b+j)fluoranthene (2)	0.005		<i>0.134</i>	<i>0.053</i>	<i>0.057</i>	<i>0.072</i>	<i>0.043</i>	<i>0.055</i>	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	0.005		<i>0.028</i>	<i>0.013</i>	<i>0.014</i>	<i>0.019</i>	<i>0.0091</i>	<i>0.02</i>	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(j)fluoranthene	0.005		<i>0.051</i>	<i>0.018</i>	<i>0.022</i>	<i>0.026</i>	<i>0.017</i>	<i>0.022</i>	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	0.005		<i>0.047</i>	<i>0.018</i>	<i>0.021</i>	<i>0.023</i>	<i>0.014</i>	<i>0.02</i>	-	-	-	-	-	-	-	6.2	-	0.1	1	10
Chrysene	0.005		<i>0.12</i>	<i>0.048 (1)</i>	<i>0.056</i>	<i>0.069</i>	<i>0.031</i>	<i>0.06</i>	-	0.108	0.846	-	-	-	-	6.2	-	-	-	-
Dibenz(a,h)anthracene	0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	0.00622	0.135	-	-	-	-	-	-	0.1	1	10
Fluoranthene	0.005		<i>0.79</i>	<i>0.18 (1)</i>	<i>0.2</i>	<i>0.13</i>	<i>0.13</i>	<i>0.15</i>	-	0.113	1.494	-	-	50	180	15.4	-	-	-	-
Fluorene	0.005		<i>0.041</i>	<i>0.02</i>	<i>0.011</i>	<i>0.02</i>	<0.0050	<0.0050	-	0.0212	0.144	-	-	-	-	15.4	0.25	-	-	-
Indeno(1,2,3-cd)pyrene	0.005		<i>0.028</i>	<i>0.013</i>	<i>0.015</i>	<i>0.018</i>	<0.0050	<i>0.02</i>	-	-	-	-	-	-	-	-	-	0.1	1	10
Naphthalene	0.005		<0.0050	<0.0050	0.012	<0.0050	<0.0050	<0.0050	-	0.0346	0.391	-	-	-	-	8.8	0.013	0.6	0.6	22
Perylene	0.005		<i>0.03</i>	<i>0.019</i>	<i>0.017</i>	<i>0.024</i>	<i>0.013</i>	<i>0.014</i>	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	0.005		<i>0.45</i>	<i>0.055 (1)</i>	<i>0.03</i>	<i>0.092</i>	<i>0.037</i>	<i>0.077</i>	-	0.0867	0.544	-	-	-	-	43	0.046	0.1	5	50
Pyrene	0.005	<i>0.54</i>	<i>0.11 (1)</i>	<i>0.14</i>	<i>0.085</i>	<i>0.084</i>	<i>0.11</i>	-	0.153	1.398	-	-	-	-	7.7	-	0.1	10	100	
Total PAH			<i>2.6095</i>	<i>0.167</i>	<i>0.7017</i>	<i>0.6985</i>	<i>0.4176</i>	<i>0.6575</i>	2.5	-	-	-	-	-	-	-	-	-	-	
Index of Additive Cancer Risk (IACR)			1.934	0.685	0.786	0.887	0.482	0.762	-	-	-	1	-	-	-	-	-	-	-	
Benzo(a)pyrene TPE (10 ⁻⁵)		mg/kg	0.11788	0.04181	0.0482	0.05448	0.026651	0.0527	-	-	-	5.3	-	-	-	-	-	-	-	
Creosote or Coal Tar source suspected/known?			Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	-	-	-	-	-	-	-	-	-	-	-	
Uncertainty Factor Applied			No	No	No	No	No	No	-	-	-	-	-	-	-	-	-	-	-	
Benzo(a)pyrene TPE (10 ⁻⁵) with UF		mg/kg	NA	NA	NA	NA	NA	NA	-	-	-	5.3	-	-	-	-	-	-	-	

Notes:

(1) Duplicate: results are outside acceptance limit. Analysis was repeated with similar results.

(2) Benzo(b+j)fluoranthene was calculated by adding Benzo(b)fluoranthene and Benzo(j)fluoranthene Results

RDL: Reportable Detection Limit

- : not available / not applicable.

Shaded numbers indicate an exceedance of CCME Interim SQG's (1991).

Bolded numbers indicate an exceedance of CCME SQG's for the protection of human health.

Blue numbers indicate an exceedance of CCME SQG's for the protection of fresh water aquatic life.

Underlined numbers indicate an exceedance of the CEPA Disposal at Sea Guidelines

Italized numbers indicate an exceedance of CCME Sediment Quality Guidelines

Benzo(a)pyrene Total Potency Equivalent has been calculated for each carcinogenic PAH compound. B[a]P TPE are calculated by multiplying the groundwater concentration of individual carcinogenic PAHs by a standardized Benzo(a)pyrene Potency Equivalence to produce a Benzo(a)pyrene relative potency concentration, and by summing the products. If the presents of coal tar creosote is detected the Calculated B[a]P TPE is multiplied by an uncertainty factor of 3 to account for carcinogenic potential of PAHs present for which a Potency Equivalent Factor (PEF) does not currently exist, but which are likely to contribute to mixture carcinogenic potential in case of soil contamination by coal tar creosote mixture.

The Index of Additive Cancer Risk (IACR) assesses potential threats to potable groundwater water quality from leaching of carcinogenic PAH mixtures from soil. The IACR is calculated by dividing the soil concentration (numerator) of each carcinogenic PAH by its soil quality guideline for protection of potable water component value (denominator) to calculate a hazard index for each PAH, and then summing the hazard indices for the entire PAH mixture, as follows:

$$= \frac{\text{Benz (a) anthracene}}{0.33 \text{ mg/}} + \frac{\text{Benzo (b+j+k) fluoranthene}}{0.16 \text{ mg/}} + \frac{\text{Benzo (g,h,i) perylene}}{6.8 \text{ mg/}} + \frac{\text{Benzo (a) pyrene}}{0.37 \text{ mg/}} + \frac{\text{Chrysene}}{2.1 \text{ mg/}} + \frac{\text{Dibenz (a,h) anthracene}}{0.23 \text{ mg/}} + \frac{\text{Indeno (1,2,3 cd) pyrene}}{2.7 \text{ mg/}}$$

Table B.2 - PAH Results for the Leachate Samples - Pinkneys Point DFO-SCH , Yarmouth County, Nova Scotia

Parameter	RDL	Units	Sample Identification and Date	CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life		Health Canada Canadian Guideline for Drinking Water Quality		
			SS-P07	Freshwater	Marine	Maximum Acceptable Concentration	Aesthetic Objective	Source Guidance Values for Groundwater
			28-Jan-13					
Leachable Polycyclic Aromatic Hydrocarbons (PAHs)								
Acenaphthene	0.0050	ug/L	0.24	5.8	-	-	-	-
Anthracene	0.0050		0.059	0.012	-	-	-	-
Benzo(a)anthracene	0.0050		0.011	0.018	-	-	-	0.1
Benzo(a)pyrene	0.0050		<0.0050	0.015	-	0.01	-	-
Benzo(b)fluoranthene	0.0050		<0.0050	-	-	-	-	-
Benzo(b+j)fluoranthene (1)	0.0050		0.005	-	-	-	-	0.1
Benzo(g,h,i)perylene	0.0050		<0.0050	-	-	-	-	1
Benzo(j)fluoranthene	0.0050		<0.0050	-	-	-	-	-
Benzo(k)fluoranthene	0.0050		<0.0050	-	-	-	-	0.1
Chrysene	0.0050		0.0097	-	-	-	-	1
Dibenz(a,h)anthracene	0.0050		<0.0050	-	-	-	-	0.01
Fluoranthene	0.0050		0.32	0.04	-	-	-	-
Fluorene	0.0050		0.23	3	-	-	-	-
Indeno(1,2,3-cd)pyrene	0.0050		<0.0050	-	-	-	-	0.1
Naphthalene	0.020		0.050	1.1	1.4	-	-	-
Phenanthrene	0.0050		0.21	0.4	-	-	-	-
Pyrene	0.0050		0.17	0.025	-	-	-	-
IACR				0.7222	-	-	-	-

Notes:

(1) Benzo(b+J)fluoranthene was calculated by adding Benzo(b)fluoranthene and Benzo(j)fluoranthene Results

RDL: Reportable Detection Limit

- : not available / not applicable.

Bolded numbers indicate an exceedance of CCME Water Quality Guidelines

Underlined numbers indicate an exceedance of Canadian Guidelines for Drinking Water Quality

^a The Index of Additive Cancer Risk (IACR) assesses potential threats to potable groundwater water quality from leaching of carcinogenic PAH mixtures from soil. The IACR result from the leachate analysis was calculated using Source Guidance Values for Groundwater which are used to direct the IACR for the soil quality guidelines. The IACR is calculated by dividing the leachate concentration (numerator) of each carcinogenic PAH by the Source Guidance Values for Groundwater (denominator) to calculate a hazard index for each PAH, and then summing the hazard indices for the entire PAH mixture,

$$= \frac{\text{Benz (a) anthracene}}{0.1 \text{ ug/}} + \frac{\text{Benzo (b+j+k) fluoranthene}}{0.1 \text{ ug/}} + \frac{\text{Benzo (g,h,i) perylene}}{1 \text{ ug/}} + \frac{\text{Benzo (a) pyrene}}{0.01 \text{ ug/}} + \frac{\text{Chrysene}}{1 \text{ ug/}} + \frac{\text{Dibenz (a,h) anthracene}}{0.01 /} + \frac{\text{Indeno (1,2,3 cd) pyrene}}{0.1 \text{ ug/}}$$

Table B.3 - Metal Concentrations for Marine Sediments-Pinkneys Point DFO-SCH, Yarmouth County, Nova Scotia

Parameter	RDL	Units	Sample Identification and Date						CEPA Disposal at Sea Guidelines	CCME Sediment Quality Guidelines		CCME Soil Quality Guidelines		
			SS-P07	SS-P16	SS-P16 Lab-Dup	SS-P24	SS-P25	SS-P35		Interim Sediment Quality Guidelines	Marine and Estuarine Probable Effects Levels	Agricultural	Residential/ Parkland	Commercial/ Industrial
			28-Jan-13											
Antimony	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-	20	20	40
Arsenic	2.0		<u>8.2</u>	4.3	4.7	6.6	2.2	2.1	-	7.24	41.6	12	12	12
Barium	5.0		<u>22</u>	18	18	23	13	13	-	-	-	750	500	2000
Beryllium	2.0		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-	4	4	8
Cadmium	0.30		<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.6	0.7	4.2	1.4	10	22
Chromium (Total)	2.0		26	17	17	19	12	10	-	52.3	160	64	64	87
Chromium (VI)	0.2		<0.2	<0.2	-	<0.2	<0.2	<0.2	-	-	-	0.4	0.4	1.4
Cobalt	1.0		4.7	4.2	4.1	4.9	3.2	3	-	-	-	40	50	300
Copper	2.0		9.5	7.8	8.2	8	3.8	2.8	-	18.7	108	63	63	91
Lead	0.50		9.2	7	7.6	9.6	3.5	2.5	-	30.2	112	70	140	260/600
Molybdenum	2.0		2.4	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-	5	10	40
Nickel	2.0		12	10	11	13	8.1	6.8	-	-	-	50	50	50
Selenium	1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	1	1	2.9
Silver	0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	20	20	40
Thallium	0.10		0.15	0.12	0.11	0.16	<0.10	<0.10	-	-	-	1	1	1
Tin	2.0		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-	5	50	300
Uranium	0.10		1	0.61	0.68	0.68	0.45	0.39	-	-	-	23	23	33
Vanadium	2.0		25	20	20	25	14	12	-	-	-	130	130	130
Zinc	5.0		50	35	36	42	22	19	-	124	271	200	200	360
Boron (Hot Water Soluble)	0.30		9	6.4	6.5	11	7.3	2.9	-	-	-	2	-	-
Mercury (Cold Vapour)	0.01	<0.010	0.01	<0.010	0.013	<0.010	<0.010	0.75	0.13	0.7	6.6	6.6	24	

Notes:

RDL: Reportable Detection Limit

- : not available / not applicable.

Bolded numbers indicate an exceedance of CCME Soil Quality Guidelines

Underlined numbers indicate an exceedance of CCME Sediment Quality Guidelines

Blue numbers indicate an exceedance of CEPA Disposal at Sea Guidelines

Table B.4 - BTEX/TPH Concentrations for Marine Sediments- Pinkneys Point DFO-SCH, Yarmouth County, Nova Scotia

Results Table for BTEX Compounds and Modified TPH												
Sample ID	Date	Units	BTEX Concentrations				Petroleum Hydrocarbon Fraction Concentrations				Reached Baseline at C32	Resemblance
			Benzene	Toluene	Ethylbenzene	Xylenes	F1	F2	F3 ^a	Modified TPH (Less BTEX)		
SS-P07	28-Jan-13	mg/kg	<0.0050	<0.025	<0.010	<0.050	<2.5	<10	<15	<15	NA	NA
SS-P07 Lab-Dup			<0.0050	<0.025	<0.010	<0.050	<2.5	-	-	-	NA	NA
SS-P16			<0.0050	<0.025	<0.010	<0.050	<2.5	<10	<15	<15	NA	NA
SS-P24			<0.0050	<0.025	<0.010	<0.050	<2.5	<10	<15	<15	NA	NA
SS-P25			<0.0050	<0.025	<0.010	<0.050	<2.5	<10	<15	<15	NA	NA
SS-P35			<0.0050	<0.025	<0.010	<0.050	<2.5	<10	<15	<15	NA	NA
RDL			0.0050	0.025	0.010	0.050	2.5	10	15	15		
Atlantic RBCA Tier I RBSLs for Soil							Gasoline	Diesel 2	Oil			
Residential	Potable	Coarse-grained	0.042	0.35	0.065	8.8	74	270	1100			
		Fine-grained	0.094	0.74	0.13	22	1900	4700	10000			
	Non-potable	Coarse-grained	0.099	77	30	8.8	74	270	1100			
		Fine-grained	2.3	10000	9300	210	2100	8600	10000			
Commercial	Potable	Coarse-grained	0.042	0.35	0.065	11	870	1800	10000			
		Fine-grained	0.094	0.74	0.13	22	1900	4700	10000			
	Non-potable	Coarse-grained	2.5	10000	10000	110	870	4000	10000			
		Fine-grained	33	10000	10000	10000	10000	10000	10000			
CCME Soil Quality Guidelines							(C ₆ -C ₁₀)	(C ₁₀ -C ₂₁)	(C ₂₁ -C ₃₄)			
Agricultural Land Use	Surface	Coarse Soil	0.03	0.37	0.082	11	30	150	300			
		Fine Soil	0.0068	0.08	0.018	2.4	210(170 ^b)	150	1300			
	Subsoil	Coarse Soil	0.03	0.37	0.082	11	30	150	300			
		Fine Soil	0.0068	0.08	0.018	2.4	210(170 ^b)	150	1300			
Residential/ Parkland Use	Surface	Coarse Soil	0.03	0.37	0.082	11	30	150	300			
		Fine Soil	0.0068	0.08	0.018	2.4	210(170 ^b)	150	1300			
	Subsoil	Coarse Soil	0.03	0.37	0.082	11	30	150	300			
		Fine Soil	0.0068	0.08	0.018	2.4	210(170 ^b)	150	1300			
Commercial/ Industrial Land Use	Surface	Coarse Soil	0.03	0.37	0.082	11	320(240 ^b)	260	1700			
		Fine Soil	0.0068	0.08	0.018	2.4	320(170 ^b)	260	2500			
	Subsoil	Coarse Soil	0.03	0.37	0.082	11	320(240 ^b)	260	1700			
		Fine Soil	0.0068	0.08	0.018	2.4	320(170 ^b)	260	2500			

Notes:

a - F3 fraction was calculated by adding (C16-C21) and (C21-C32) hydrocarbon fractions. The above F3 does not include C33 or C34.

b - for the protection of groundwater

RDL: Reportable Detection Limit

- : not available / not applicable

NA: Not Applicable

Bolded numbers indicate an exceedence

CCME SQG - Canadian Council of Ministers of the Environment. 1999. Canadian soil quality guidelines for the protection of environmental and human health.

Atlantic RBCA = Risk Based Corrective Actions for Residential and Commercial Petroleum Hydrocarbon Impacted Sites (Version 3, July 2012).

Table B.5 - PCB and DDT Analytical Results for Marine Sediments- Pinkneys Point DFO-SCH, Yarmouth County, Nova Scotia

Parameter	RDL	Units	Sample Identification and Date						CEPA Disposal at Sea Guidelines	CCME Sediment Quality Guidelines		CCME Soil Quality Guidelines		
			SS-P07	SS-P07 Lab-Dup	SS-P16	SS-P24	SS-P25	SS-P35		Interim Sediment Quality Guidelines	Marine and Estuarine Probable Effects Levels	Agricultural	Residential/ Parkland	Commercial/ Industrial
			28-Jan-13											
Polychlorinated Biphenyl (PCB) Results														
Total PCB Concentration	0.01	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.1	-	-	0.5	1.3	33
Dichloro-Diphenyl-Trichloroethane (DDT) Results														
o,p-DDE	- ^a	mg/kg	<0.0040	-	<0.0040	<0.0050	<0.0040	<0.0020	-	-	-	-	-	-
p,p-DDE	- ^a		<0.0040	-	<0.0040	<0.0050	<0.0040	<0.0020	-	-	-	-	-	-
o,p-DDD	- ^a		<0.0040	-	<0.0040	<0.0050	<0.0040	<0.0020	-	-	-	-	-	-
p,p-DDD	- ^a		<0.0040	-	<0.0040	<0.0050	<0.0040	<0.0020	-	-	-	-	-	-
o,p-DDT	- ^a		<0.0040	-	<0.0040	<0.0050	<0.0040	<0.0020	-	-	-	-	-	-
p,p-DDT	- ^a		<0.0040	-	0.0070	<0.0050	<0.0040	<0.0020	-	-	-	-	-	-
o,p-DDT + p,p-DDT	- ^a		<0.0040	-	<u>0.0070</u>	<0.0050	<0.0040	<0.0020	-	0.0019	0.00477	-	-	-
o,p-DDD + p,p-DDD	- ^a		<0.0040	-	<0.0040	<0.0050	<0.0040	<0.0020	-	0.00122	0.00781	-	-	-
o,p-DDE + p,p-DDE	- ^a		<0.0040	-	<0.0040	<0.0050	<0.0040	<0.0020	-	0.00201	0.374	-	-	-
Total DDT (calculated)	- ^a		<0.0040	-	0.0070	<0.0050	<0.0040	<0.0020	-	-	-	0.7	0.7	12

Notes:

a- Detection limits varied

- : not available / not applicable.

Elevated RDLs for all samples exceeded Sediment Quality Guidelines.

CEPA Disposal at Sea Guidelines = Canadian Environmental Protection Act Disposal at Sea sediment screening guidelines (2001).

Bolded numbers indicate an exceedance of CCME Soil Quality Guidelines

Underlined numbers indicate an exceedance of CCME Sediment Quality Guidelines

Blue numbers indicate an exceedance of CEPA Disposal at Sea Guidelines

Table B.6 - TIC, TOC and Grain Size Analytical Results for Marine Sediments - Pinkneys Point DFO-SCH, Yarmouth County, Nova Scotia

Parameter	RDL	Units	Sample Identification and Date					
			SS-P07	SS-P07 Lab-Dup	SS-P16	SS-P24	SS-P25	SS-P35
			28-Jan-13					
Grain Size Results								
< PHI -4 (16 mm)	0.1	%	100	100	100	100	100	100
< PHI -3 (8 mm)	0.1		100	100	100	100	100	100
< PHI -2 (4 mm)	0.1		100	100	100	100	100	100
< PHI -1 (2 mm)	0.1		100	100	100	100	99 (1)	100
< PHI 0 (1/2 mm)	0.1		98	98	99	98	97 (1)	100
< PHI +1 (1/4 mm)	0.1		96	96	98	97	94	99
< PHI +2 (1/8 mm)	0.1		93	93	95	96	90	98
< PHI +3 (1/16 mm)	0.1		86	85	86	93	73	87
< PHI +4 (1/32 mm)	0.1		63	63	54	83	28	33
< PHI +5 (1/32 mm)	0.1		38	44	27	57	16	9.8
< PHI +6 (1/64 mm)	0.1		20	23	17	37	11	4.2
< PHI +7 (1/128 mm)	0.1		12	13	12	24	10	3
< PHI +8 (1/256 mm)	0.1		10	11	10	21	10.0	3.1
< PHI +9 (1/512 mm)	0.1		7.9	9.3	8.2	17	7.6	2.7
Gravel	0.1		<0.10	<0.10	0.27	<0.10	0.81	<0.10
Sand	0.1	37	37	46	17	72	67	
Silt	0.1	53	52	44	62	18	30	
Clay	0.1	10	11	10	21	10.0	3.1	
Other								
Total Organic Carbon (TOC)	0.6	g/kg	26	-	12	20	9.9	4.0
Total Inorganic Carbon (TIC)	0.66	g/kg	1.8	-	4	6.9	4.6	3.9
Total Carbon (TC)	0.66	g/kg	28	-	16	27	15	7.9
Moisture		%	47	-	42	57	41	26

Notes:

(1) Sample observation comment: fraction contained organic matter

RDL = Reportable Detection Limit

- : not available / not applicable.

APPENDIX C

QA/QC, COC, and Laboratory Certificates of Analyses

Your Project #: 131203.03
 Site Location: PINKNEYS POINT SCH
 Your C.O.C. #: N/A

Attention: Peter Lane

CBCL Limited
 Halifax - Standing offer
 1489 Hollis St
 PO Box 606
 Halifax, NS
 B3J 2R7

Report Date: 2013/02/20

This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B314122

Received: 2013/01/29, 15:57

Sample Matrix: Soil
 # Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Boron Solid MS - Hot Water Soluble	5	2013/02/04	2013/02/05	ATL SOP-00059	Based on EPA 6020A
Hexavalent Chromium in Soil by IC (1,2)	5	2013/02/06	2013/02/07	CAM SOP-00436	EPA SW846-3060/7199
TEH in Soil (PIRI) (2)	4	2013/01/31	2013/02/04	ATL SOP 00111	Based on Atl. PIRI
TEH in Soil (PIRI) (2)	1	2013/01/31	2013/02/05	ATL SOP 00111	Based on Atl. PIRI
Mercury (CVAA)	5	2013/02/05	2013/02/05	ATL SOP 00026	Based on EPA245.5
Metals Solids Acid Extr. ICPMS Low Level (3)	5	2013/02/01	2013/02/01	ATL SOP 00024	Based on EPA6020A
Moisture	5	N/A	2013/01/31	ATL SOP 00001	MOE Handbook 1983
OC Pesticides (Selected) & PCB (1,4)	5	2013/02/06	2013/02/08	CAM SOP-00307	SW846 8081, 8082
PAH in Leachates GC/MS (Low Level)	1	2013/02/18	2013/02/20	ATL SOP 00103 R3	Based on EPA 8270C
PAH in sediment by GC/MS (Low Level)	3	2013/02/04	2013/02/05	ATL SOP 00102	based on EPA8270C
PAH in sediment by GC/MS (Low Level)	2	2013/02/04	2013/02/06	ATL SOP 00102	based on EPA8270C
Low Level PCB in Soil by GC-ECD	5	2013/02/04	2013/02/08	ATL SOP 00106	Based EPA8082
VPH in Soil - Low Level	5	2013/01/31	2013/01/31	ATL SOP 00119	Based on Atl. PIRI
Particle size in solids (pipette&sieve)	5	N/A	2013/02/11	ATL SOP 00012	based on MSAMS-1978
SPLP Inorganic extraction - pH	1	N/A	2013/02/15	ATL SOP 00036	Based on EPA1312
SPLP Inorganic extraction - Weight	1	N/A	2013/02/15	ATL SOP 00036	Based on EPA1312
Total Carbon in Solids by Ind.	4	2013/02/07	2013/02/07	ATL SOP 00044/00045	LECO 203-601-224
Total Carbon in Solids by Ind.	1	2013/02/08	2013/02/08	ATL SOP 00044/00045	LECO 203-601-224
TIC in soil	5	2013/01/30	2013/02/08	ATL SOP 00044/00045	LECO 203-601-224
Total Organic Carbon in Soil	1	2013/02/06	2013/02/06	ATL SOP 00044/00045	LECO 203-601-224
Total Organic Carbon in Soil	4	2013/02/07	2013/02/07	ATL SOP 00044/00045	LECO 203-601-224
ModTPH (T1) Calc. for Soil	4	2013/01/30	2013/02/05		Based on Atl. PIRI
ModTPH (T1) Calc. for Soil	1	2013/01/30	2013/02/06		Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

* 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.

(3) Note: Metals naming convention has been changed from "Available" to "Acid Extractable" as part of a national harmonization initiative. Contact your project manager for additional details.
(4) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

Encryption Key

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

Keri Mackay, Project Manager - Bedford
Email: kmackay@maxxam.ca
Phone# (902) 420-0203 Ext:294

=====
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

Page 2 of 33

Maxxam Job #: B314122
 Report Date: 2013/02/20

 CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

ATLANTIC LOW MUST IN SOIL (POTABLE)

Maxxam ID		QJ8623	QJ8623	QJ8624	QJ8625	QJ8626		
Sampling Date		2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28		
COC Number		N/A	N/A	N/A	N/A	N/A		
	Units	SS-P07	SS-P07 Lab-Dup	SS-P16	SS-P24	SS-P25	RDL	QC Batch

Inorganics								
Moisture	%	47		42	57	41	1	3110068
Petroleum Hydrocarbons								
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	3110288
Toluene	mg/kg	<0.025	<0.025	<0.025	<0.025	<0.025	0.025	3110288
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3110288
Xylene (Total)	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3110288
C6 - C10 (less BTEX)	mg/kg	<2.5	<2.5	<2.5	<2.5	<2.5	2.5	3110288
>C10-C16 Hydrocarbons	mg/kg	<10		<10	<10	<10	10	3110136
>C16-C21 Hydrocarbons	mg/kg	<10		<10	<10	<10	10	3110136
>C21-<C32 Hydrocarbons	mg/kg	<15		<15	<15	<15	15	3110136
Modified TPH (Tier1)	mg/kg	<15		<15	<15	<15	15	3108930
Reached Baseline at C32	mg/kg	NA		NA	NA	NA	N/A	3110136
Hydrocarbon Resemblance	mg/kg	NA		NA	NA	NA	N/A	3110136
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	97		100	101	106		3110136
n-Dotriacontane - Extractable	%	101		114	108	106		3110136
Isobutylbenzene - Volatile	%	90	94	109	109	101		3110288

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

Maxxam Job #: B314122
 Report Date: 2013/02/20

CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

ATLANTIC LOW MUST IN SOIL (POTABLE)

Maxxam ID		QJ8627		
Sampling Date		2013/01/28		
COC Number		N/A		
	Units	SS-P35	RDL	QC Batch

Inorganics				
Moisture	%	26	1	3110068
Petroleum Hydrocarbons				
Benzene	mg/kg	<0.0050	0.0050	3110288
Toluene	mg/kg	<0.025	0.025	3110288
Ethylbenzene	mg/kg	<0.010	0.010	3110288
Xylene (Total)	mg/kg	<0.050	0.050	3110288
C6 - C10 (less BTEX)	mg/kg	<2.5	2.5	3110288
>C10-C16 Hydrocarbons	mg/kg	<10	10	3110136
>C16-C21 Hydrocarbons	mg/kg	<10	10	3110136
>C21-<C32 Hydrocarbons	mg/kg	<15	15	3110136
Modified TPH (Tier1)	mg/kg	<15	15	3108930
Reached Baseline at C32	mg/kg	NA	N/A	3110136
Hydrocarbon Resemblance	mg/kg	NA	N/A	3110136
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	90		3110136
n-Dotriacontane - Extractable	%	97		3110136
Isobutylbenzene - Volatile	%	104		3110288

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

Maxxam Job #: B314122
 Report Date: 2013/02/20

CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

ATLANTIC SPLP LEACHATE ONLY (SOIL)

Maxxam ID		QJ8623	
Sampling Date		2013/01/28	
COC Number		N/A	
	Units	SS-P07	QC Batch

Charge/Prep Analysis			
Sample Weight (as received)	g	50	3124960
Final pH	N/A	8.26	3124962

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

Maxxam Job #: B314122
 Report Date: 2013/02/20

CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

ATLANTIC TOTAL ORGANIC/INORGANIC CARBON (SOIL)

Maxxam ID		QJ8623			QJ8624	QJ8624		QJ8625		
Sampling Date		2013/01/28			2013/01/28	2013/01/28		2013/01/28		
COC Number		N/A			N/A	N/A		N/A		
	Units	SS-P07	RDL	QC Batch	SS-P16	SS-P16 Lab-Dup	RDL	SS-P24	RDL	QC Batch

Inorganics										
Total Inorganic Carbon (C)	g/kg	1.8	0.60	3109409	4.0		0.50	6.9	0.70	3109409
Organic Carbon (TOC)	g/kg	26	0.60	3115408	12		0.50	20	0.70	3116707
Total Carbon-combustion IR	g/kg	28	0.50	3118538	16	16	0.30	27	0.30	3116777

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

Maxxam ID		QJ8626			QJ8627		
Sampling Date		2013/01/28			2013/01/28		
COC Number		N/A			N/A		
	Units	SS-P25	RDL	SS-P35	RDL	QC Batch	

Inorganics							
Total Inorganic Carbon (C)	g/kg	4.6	0.70	3.9	0.40	3109409	
Organic Carbon (TOC)	g/kg	9.9	0.70	4.0	0.40	3116707	
Total Carbon-combustion IR	g/kg	15	0.30	7.9	0.30	3116777	

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

Maxxam Job #: B314122
 Report Date: 2013/02/20

 CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

RESULTS OF ANALYSES OF SOIL

Maxxam ID		QJ8623	QJ8623	QJ8624	QJ8625	QJ8626	QJ8627		
Sampling Date		2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28		
COC Number		N/A	N/A	N/A	N/A	N/A	N/A		
	Units	SS-P07	SS-P07 Lab-Dup	SS-P16	SS-P24	SS-P25	SS-P35	RDL	QC Batch

Inorganics									
Chromium (VI)	ug/g	<0.2		<0.2	<0.2	<0.2	<0.2	0.2	3115123
< -4 Phi (16 mm)	%	100	100	100	100	100	100	0.10	3119544
< -3 Phi (8 mm)	%	100	100	100	100	100	100	0.10	3119544
< -2 Phi (4 mm)	%	100	100	100	100	100	100	0.10	3119544
< -1 Phi (2 mm)	%	100	100	100	100	99 (1)	100	0.10	3119544
< 0 Phi (1 mm)	%	98	98	99	98	97 (1)	100	0.10	3119544
< +1 Phi (0.5 mm)	%	96	96	98	97	94	99	0.10	3119544
< +2 Phi (0.25 mm)	%	93	93	95	96	90	98	0.10	3119544
< +3 Phi (0.12 mm)	%	86	85	86	93	73	87	0.10	3119544
< +4 Phi (0.062 mm)	%	63	63	54	83	28	33	0.10	3119544
< +5 Phi (0.031 mm)	%	38	44	27	57	16	9.8	0.10	3119544
< +6 Phi (0.016 mm)	%	20	23	17	37	11	4.2	0.10	3119544
< +7 Phi (0.0078 mm)	%	12	13	12	24	10	3.0	0.10	3119544
< +8 Phi (0.0039 mm)	%	10	11	10	21	10	3.1	0.10	3119544
< +9 Phi (0.0020 mm)	%	7.9	9.3	8.2	17	7.6	2.7	0.10	3119544
Gravel	%	<0.10	<0.10	0.27	<0.10	0.81	<0.10	0.10	3119544
Sand	%	37	37	46	17	72	67	0.10	3119544
Silt	%	53	52	44	62	18	30	0.10	3119544
Clay	%	10	11	10	21	10	3.1	0.10	3119544

N/A = Not Applicable
 RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 (1) Sample observation comment: fraction contained organic matter

Maxxam Job #: B314122
 Report Date: 2013/02/20

CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

MERCURY BY COLD VAPOUR AA (SOIL)

Maxxam ID		QJ8623	QJ8624	QJ8624	QJ8625	QJ8626	QJ8627		
Sampling Date		2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28		
COC Number		N/A	N/A	N/A	N/A	N/A	N/A		
	Units	SS-P07	SS-P16	SS-P16 Lab-Dup	SS-P24	SS-P25	SS-P35	RDL	QC Batch

Metals									
Mercury (Hg)	mg/kg	<0.010	0.010	<0.010	0.013	<0.010	<0.010	0.010	3114262

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

Maxxam Job #: B314122
 Report Date: 2013/02/20

CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

ELEMENTS BY ICP/MS (SOIL)

Maxxam ID		QJ8623	QJ8624	QJ8624	QJ8625	QJ8626	QJ8627		
Sampling Date		2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28		
COC Number		N/A	N/A	N/A	N/A	N/A	N/A		
	Units	SS-P07	SS-P16	SS-P16 Lab-Dup	SS-P24	SS-P25	SS-P35	RDL	QC Batch

Metals									
Soluble (Hot Water) Boron (B)	mg/kg	9.0	6.4	6.5	11	7.3	2.9	0.30	3113313

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

Maxxam Job #: B314122
 Report Date: 2013/02/20

CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

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

Maxxam ID		QJ8623	QJ8623	QJ8624	QJ8625	QJ8626	QJ8627		
Sampling Date		2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28		
COC Number		N/A	N/A	N/A	N/A	N/A	N/A		
	Units	SS-P07	SS-P07 Lab-Dup	SS-P16	SS-P24	SS-P25	SS-P35	RDL	QC Batch

PCBs									
Total PCB	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3113123
Surrogate Recovery (%)									
Decachlorobiphenyl	%	92	85	90	79	89	90		3113123

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

Maxxam Job #: B314122
 Report Date: 2013/02/20

 CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		QJ8623	QJ8624	QJ8624	QJ8625	QJ8626		
Sampling Date		2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28		
COC Number		N/A	N/A	N/A	N/A	N/A		
	Units	SS-P07	SS-P16	SS-P16 Lab-Dup	SS-P24	SS-P25	RDL	QC Batch

Metals								
Acid Extractable Aluminum (Al)	mg/kg	7600	6500	6600	8100	5000	10	3111245
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3111245
Acid Extractable Arsenic (As)	mg/kg	8.2	4.3	4.7	6.6	2.2	2.0	3111245
Acid Extractable Barium (Ba)	mg/kg	22	18	18	23	13	5.0	3111245
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3111245
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3111245
Acid Extractable Boron (B)	mg/kg	52	28	30	48	28	5.0	3111245
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	3111245
Acid Extractable Chromium (Cr)	mg/kg	26	17	17	19	12	2.0	3111245
Acid Extractable Cobalt (Co)	mg/kg	4.7	4.2	4.1	4.9	3.2	1.0	3111245
Acid Extractable Copper (Cu)	mg/kg	9.5	7.8	8.2	8.0	3.8	2.0	3111245
Acid Extractable Iron (Fe)	mg/kg	14000	12000	12000	15000	9500	50	3111245
Acid Extractable Lead (Pb)	mg/kg	9.2	7.0	7.6	9.6	3.5	0.50	3111245
Acid Extractable Lithium (Li)	mg/kg	17	15	16	18	13	2.0	3111245
Acid Extractable Manganese (Mn)	mg/kg	170	150	150	190	120	2.0	3111245
Acid Extractable Molybdenum (Mo)	mg/kg	2.4	<2.0	<2.0	<2.0	<2.0	2.0	3111245
Acid Extractable Nickel (Ni)	mg/kg	12	10	11	13	8.1	2.0	3111245
Acid Extractable Rubidium (Rb)	mg/kg	12	10	11	13	8.1	2.0	3111245
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3111245
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3111245
Acid Extractable Strontium (Sr)	mg/kg	51	54	61	65	66	5.0	3111245
Acid Extractable Thallium (Tl)	mg/kg	0.15	0.12	0.11	0.16	<0.10	0.10	3111245
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3111245
Acid Extractable Uranium (U)	mg/kg	1.0	0.61	0.68	0.68	0.45	0.10	3111245
Acid Extractable Vanadium (V)	mg/kg	25	20	20	25	14	2.0	3111245
Acid Extractable Zinc (Zn)	mg/kg	50	35	36	42	22	5.0	3111245

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

Maxxam Job #: B314122
 Report Date: 2013/02/20

CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		QJ8627		
Sampling Date		2013/01/28		
COC Number		N/A		
	Units	SS-P35	RDL	QC Batch

Metals				
Acid Extractable Aluminum (Al)	mg/kg	4600	10	3111245
Acid Extractable Antimony (Sb)	mg/kg	<2.0	2.0	3111245
Acid Extractable Arsenic (As)	mg/kg	2.1	2.0	3111245
Acid Extractable Barium (Ba)	mg/kg	13	5.0	3111245
Acid Extractable Beryllium (Be)	mg/kg	<2.0	2.0	3111245
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	2.0	3111245
Acid Extractable Boron (B)	mg/kg	8.7	5.0	3111245
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.30	3111245
Acid Extractable Chromium (Cr)	mg/kg	10	2.0	3111245
Acid Extractable Cobalt (Co)	mg/kg	3.0	1.0	3111245
Acid Extractable Copper (Cu)	mg/kg	2.8	2.0	3111245
Acid Extractable Iron (Fe)	mg/kg	8500	50	3111245
Acid Extractable Lead (Pb)	mg/kg	2.5	0.50	3111245
Acid Extractable Lithium (Li)	mg/kg	12	2.0	3111245
Acid Extractable Manganese (Mn)	mg/kg	130	2.0	3111245
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	2.0	3111245
Acid Extractable Nickel (Ni)	mg/kg	6.8	2.0	3111245
Acid Extractable Rubidium (Rb)	mg/kg	7.2	2.0	3111245
Acid Extractable Selenium (Se)	mg/kg	<1.0	1.0	3111245
Acid Extractable Silver (Ag)	mg/kg	<0.50	0.50	3111245
Acid Extractable Strontium (Sr)	mg/kg	54	5.0	3111245
Acid Extractable Thallium (Tl)	mg/kg	<0.10	0.10	3111245
Acid Extractable Tin (Sn)	mg/kg	<2.0	2.0	3111245
Acid Extractable Uranium (U)	mg/kg	0.39	0.10	3111245
Acid Extractable Vanadium (V)	mg/kg	12	2.0	3111245
Acid Extractable Zinc (Zn)	mg/kg	19	5.0	3111245
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Maxxam Job #: B314122
 Report Date: 2013/02/20

 CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QJ8623	QJ8623	QJ8624	QJ8625	QJ8626		
Sampling Date		2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28		
COC Number		N/A	N/A	N/A	N/A	N/A		
	Units	SS-P07	SS-P07 Lab-Dup	SS-P16	SS-P24	SS-P25	RDL	QC Batch

Polyaromatic Hydrocarbons								
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	3113347
Leachable 1-Methylnaphthalene	ug/L	0.029					0.010	3126680
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	3113347
Leachable 2-Methylnaphthalene	ug/L	0.044					0.010	3126680
Acenaphthene	mg/kg	0.023	0.018	0.0087	0.018	<0.0050	0.0050	3113347
Leachable Acenaphthene	ug/L	0.24					0.0050	3126680
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	3113347
Leachable Acenaphthylene	ug/L	<0.0050					0.0050	3126680
Anthracene	mg/kg	0.12	0.018	0.023	0.033	<0.0050	0.0050	3113347
Leachable Anthracene	ug/L	0.059					0.0050	3126680
Benzo(a)anthracene	mg/kg	0.17	0.043 (1)	0.057	0.048	0.018	0.0050	3113347
Leachable Benzo(a)anthracene	ug/L	0.011					0.0050	3126680
Benzo(a)pyrene	mg/kg	0.076	0.026 (1)	0.030	0.035	0.016	0.0050	3113347
Leachable Benzo(a)pyrene	ug/L	<0.0050					0.0050	3126680
Benzo(b)fluoranthene	mg/kg	0.083	0.035 (1)	0.035	0.046	0.026	0.0050	3113347
Leachable Benzo(b)fluoranthene	ug/L	<0.0050					0.0050	3126680
Benzo(g,h,i)perylene	mg/kg	0.028	0.013	0.014	0.019	0.0091	0.0050	3113347
Leachable Benzo(g,h,i)perylene	ug/L	<0.0050					0.0050	3126680
Benzo(j)fluoranthene	mg/kg	0.051	0.018	0.022	0.026	0.017	0.0050	3113347
Leachable Benzo(j)fluoranthene	ug/L	<0.0050					0.0050	3126680
Benzo(k)fluoranthene	mg/kg	0.047	0.018	0.021	0.023	0.014	0.0050	3113347
Leachable Benzo(k)fluoranthene	ug/L	<0.0050					0.0050	3126680
Chrysene	mg/kg	0.12	0.048 (1)	0.056	0.069	0.031	0.0050	3113347
Leachable Chrysene	ug/L	0.0097					0.0050	3126680
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	3113347
Leachable Dibenz(a,h)anthracene	ug/L	<0.0050					0.0050	3126680
Fluoranthene	mg/kg	0.79	0.18 (1)	0.20	0.13	0.13	0.0050	3113347
Leachable Fluoranthene	ug/L	0.32					0.0050	3126680
Fluorene	mg/kg	0.041	0.020	0.011	0.020	<0.0050	0.0050	3113347
Leachable Fluorene	ug/L	0.23					0.0050	3126680

N/A = Not Applicable

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Duplicate: results are outside acceptance limit. Analysis was repeated with similar results.

Maxxam Job #: B314122
 Report Date: 2013/02/20

 CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QJ8623	QJ8623	QJ8624	QJ8625	QJ8626		
Sampling Date		2013/01/28	2013/01/28	2013/01/28	2013/01/28	2013/01/28		
COC Number		N/A	N/A	N/A	N/A	N/A		
	Units	SS-P07	SS-P07 Lab-Dup	SS-P16	SS-P24	SS-P25	RDL	QC Batch
Indeno(1,2,3-cd)pyrene	mg/kg	0.028	0.013	0.015	0.018	<0.0050	0.0050	3113347
Leachable Indeno(1,2,3-cd)pyrene	ug/L	<0.0050					0.0050	3126680
Naphthalene	mg/kg	<0.0050	<0.0050	0.012	<0.0050	<0.0050	0.0050	3113347
Leachable Naphthalene	ug/L	0.050					0.020	3126680
Perylene	mg/kg	0.030	0.019	0.017	0.024	0.013	0.0050	3113347
Leachable Perylene	ug/L	<0.0050					0.0050	3126680
Phenanthrene	mg/kg	0.45	0.055 (1)	0.030	0.092	0.037	0.0050	3113347
Leachable Phenanthrene	ug/L	0.21					0.0050	3126680
Pyrene	mg/kg	0.54	0.11 (1)	0.14	0.085	0.084	0.0050	3113347
Leachable Pyrene	ug/L	0.17					0.0050	3126680
Surrogate Recovery (%)								
Leachable D10-Anthracene	%	94						3126680
Leachable D14-Terphenyl	%	98						3126680
Leachable D8-Acenaphthylene	%	91						3126680
D10-Anthracene	%	91	93	94	85	94		3113347
D14-Terphenyl	%	93	94	98	83	101		3113347
D8-Acenaphthylene	%	87	89	93	93	93		3113347
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch (1) Duplicate: results are outside acceptance limit. Analysis was repeated with similar results.								

Maxxam Job #: B314122
 Report Date: 2013/02/20

CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		QJ8627		
Sampling Date		2013/01/28		
COC Number		N/A		
	Units	SS-P35	RDL	QC Batch

Polyaromatic Hydrocarbons				
1-Methylnaphthalene	mg/kg	<0.0050	0.0050	3113347
2-Methylnaphthalene	mg/kg	<0.0050	0.0050	3113347
Acenaphthene	mg/kg	<0.0050	0.0050	3113347
Acenaphthylene	mg/kg	<0.0050	0.0050	3113347
Anthracene	mg/kg	0.030	0.0050	3113347
Benzo(a)anthracene	mg/kg	0.049	0.0050	3113347
Benzo(a)pyrene	mg/kg	0.035	0.0050	3113347
Benzo(b)fluoranthene	mg/kg	0.033	0.0050	3113347
Benzo(g,h,i)perylene	mg/kg	0.020	0.0050	3113347
Benzo(j)fluoranthene	mg/kg	0.022	0.0050	3113347
Benzo(k)fluoranthene	mg/kg	0.020	0.0050	3113347
Chrysene	mg/kg	0.060	0.0050	3113347
Dibenz(a,h)anthracene	mg/kg	<0.0050	0.0050	3113347
Fluoranthene	mg/kg	0.15	0.0050	3113347
Fluorene	mg/kg	<0.0050	0.0050	3113347
Indeno(1,2,3-cd)pyrene	mg/kg	0.020	0.0050	3113347
Naphthalene	mg/kg	<0.0050	0.0050	3113347
Perylene	mg/kg	0.014	0.0050	3113347
Phenanthrene	mg/kg	0.077	0.0050	3113347
Pyrene	mg/kg	0.11	0.0050	3113347
Surrogate Recovery (%)				
D10-Anthracene	%	95		3113347
D14-Terphenyl	%	97		3113347
D8-Acenaphthylene	%	96		3113347

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

Maxxam Job #: B314122
 Report Date: 2013/02/20

 CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		QJ8623	QJ8624		QJ8625		QJ8626		
Sampling Date		2013/01/28	2013/01/28		2013/01/28		2013/01/28		
COC Number		N/A	N/A		N/A		N/A		
	Units	SS-P07	SS-P16	RDL	SS-P24	RDL	SS-P25	RDL	QC Batch

Pesticides & Herbicides									
Aldrin	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
a-Chlordane	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
g-Chlordane	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Chlordane (Total)	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
o,p-DDD	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
p,p-DDD	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
o,p-DDD + p,p-DDD	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
o,p-DDE	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
p,p-DDE	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
o,p-DDE + p,p-DDE	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
o,p-DDT	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
p,p-DDT	ug/g	<0.0040	0.0070	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
o,p-DDT + p,p-DDT	ug/g	<0.0040	0.0070	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
DDT+ Metabolites	ug/g	<0.0040	0.0070	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Dieldrin	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Lindane	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Endosulfan I (alpha)	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Endosulfan II	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Total Endosulfan	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Endrin	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Heptachlor	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Heptachlor epoxide	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Hexachlorobenzene	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Methoxychlor	ug/g	<0.010	<0.010	0.010	<0.015	0.015	<0.010	0.010	3115441
Aroclor 1016	ug/g	<0.030	<0.030	0.030	<0.040	0.040	<0.030	0.030	3115441
Aroclor 1221	ug/g	<0.030	<0.030	0.030	<0.040	0.040	<0.030	0.030	3115441
Aroclor 1232	ug/g	<0.030	<0.030	0.030	<0.040	0.040	<0.030	0.030	3115441
Aroclor 1242	ug/g	<0.030	<0.030	0.030	<0.040	0.040	<0.030	0.030	3115441
Aroclor 1248	ug/g	<0.030	<0.030	0.030	<0.040	0.040	<0.030	0.030	3115441
Aroclor 1254	ug/g	<0.030	<0.030	0.030	<0.040	0.040	<0.030	0.030	3115441
Aroclor 1260	ug/g	<0.030	<0.030	0.030	<0.040	0.040	<0.030	0.030	3115441

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

Maxxam Job #: B314122
 Report Date: 2013/02/20

 CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		QJ8623	QJ8624		QJ8625		QJ8626		
Sampling Date		2013/01/28	2013/01/28		2013/01/28		2013/01/28		
COC Number		N/A	N/A		N/A		N/A		
	Units	SS-P07	SS-P16	RDL	SS-P24	RDL	SS-P25	RDL	QC Batch

Aroclor 1262	ug/g	<0.030	<0.030	0.030	<0.040	0.040	<0.030	0.030	3115441
Aroclor 1268	ug/g	<0.030	<0.030	0.030	<0.040	0.040	<0.030	0.030	3115441
alpha-BHC	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
beta-BHC	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
delta-BHC	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Endosulfan sulfate	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Endrin aldehyde	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Endrin ketone	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Mirex	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Octachlorostyrene	ug/g	<0.0040	<0.0040	0.0040	<0.0050	0.0050	<0.0040	0.0040	3115441
Toxaphene	ug/g	<0.16	<0.16	0.16	<0.20	0.20	<0.16	0.16	3115441
Surrogate Recovery (%)									
2,4,5,6-Tetrachloro-m-xylene	%	49 (1)	72		88		71		3115441
Decachlorobiphenyl	%	50	73		129		65		3115441

N/A = Not Applicable

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Surrogate recovery was below the control limit as stipulated by Ontario Regulation 153, however, this recovery is still within Maxxam's performance based limits. Results reported with surrogate recoveries within this range are still valid but may have an associated low bias.

Maxxam Job #: B314122
Report Date: 2013/02/20

CBCL Limited
Client Project #: 131203.03
Site Location: PINKNEYS POINT SCH

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		QJ8627		
Sampling Date		2013/01/28		
COC Number		N/A		
	Units	SS-P35	RDL	QC Batch

Pesticides & Herbicides				
Aldrin	ug/g	<0.0020	0.0020	3115441
a-Chlordane	ug/g	<0.0020	0.0020	3115441
g-Chlordane	ug/g	<0.0020	0.0020	3115441
Chlordane (Total)	ug/g	<0.0020	0.0020	3115441
o,p-DDD	ug/g	<0.0020	0.0020	3115441
p,p-DDD	ug/g	<0.0020	0.0020	3115441
o,p-DDD + p,p-DDD	ug/g	<0.0020	0.0020	3115441
o,p-DDE	ug/g	<0.0020	0.0020	3115441
p,p-DDE	ug/g	<0.0020	0.0020	3115441
o,p-DDE + p,p-DDE	ug/g	<0.0020	0.0020	3115441
o,p-DDT	ug/g	<0.0020	0.0020	3115441
p,p-DDT	ug/g	<0.0020	0.0020	3115441
o,p-DDT + p,p-DDT	ug/g	<0.0020	0.0020	3115441
DDT+ Metabolites	ug/g	<0.0020	0.0020	3115441
Dieldrin	ug/g	<0.0020	0.0020	3115441
Lindane	ug/g	<0.0020	0.0020	3115441
Endosulfan I (alpha)	ug/g	<0.0020	0.0020	3115441
Endosulfan II	ug/g	<0.0020	0.0020	3115441
Total Endosulfan	ug/g	<0.0020	0.0020	3115441
Endrin	ug/g	<0.0020	0.0020	3115441
Heptachlor	ug/g	<0.0020	0.0020	3115441
Heptachlor epoxide	ug/g	<0.0020	0.0020	3115441
Hexachlorobenzene	ug/g	<0.0020	0.0020	3115441
Methoxychlor	ug/g	<0.0050	0.0050	3115441
Aroclor 1016	ug/g	<0.015	0.015	3115441
Aroclor 1221	ug/g	<0.015	0.015	3115441
Aroclor 1232	ug/g	<0.015	0.015	3115441
Aroclor 1242	ug/g	<0.015	0.015	3115441
Aroclor 1248	ug/g	<0.015	0.015	3115441
Aroclor 1254	ug/g	<0.015	0.015	3115441
Aroclor 1260	ug/g	<0.015	0.015	3115441
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Maxxam Job #: B314122
 Report Date: 2013/02/20

CBCL Limited
 Client Project #: 131203.03
 Site Location: PINKNEYS POINT SCH

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		QJ8627		
Sampling Date		2013/01/28		
COC Number		N/A		
	Units	SS-P35	RDL	QC Batch

Aroclor 1262	ug/g	<0.015	0.015	3115441
Aroclor 1268	ug/g	<0.015	0.015	3115441
alpha-BHC	ug/g	<0.0020	0.0020	3115441
beta-BHC	ug/g	<0.0020	0.0020	3115441
delta-BHC	ug/g	<0.0020	0.0020	3115441
Endosulfan sulfate	ug/g	<0.0020	0.0020	3115441
Endrin aldehyde	ug/g	<0.0020	0.0020	3115441
Endrin ketone	ug/g	<0.0020	0.0020	3115441
Mirex	ug/g	<0.0020	0.0020	3115441
Octachlorostyrene	ug/g	<0.0020	0.0020	3115441
Toxaphene	ug/g	<0.080	0.080	3115441
Surrogate Recovery (%)				
2,4,5,6-Tetrachloro-m-xylene	%	107		3115441
Decachlorobiphenyl	%	78		3115441

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

Maxxam Job #: B314122
Report Date: 2013/02/20

CBCL Limited
Client Project #: 131203.03
Site Location: PINKNEYS POINT SCH

Package 1	1.3°C
-----------	-------

Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

TEH Analysis: Silica gel clean-up performed prior to analysis as per client request.
TEH Analysis: No presence of creosote.

OC Pesticide Analysis: Detection limits were adjusted for high moisture content.

Revised report - SPLP leachate added after first reporting. Feb. 20/13 KCN

Results relate only to the items tested.

CBCL Limited
 Attention: Peter Lane
 Client Project #: 131203.03
 P.O. #:
 Site Location: PINKNEYS POINT SCH

Quality Assurance Report

Maxxam Job Number: DB314122

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits	
3110136 JRU	Matrix Spike	Isobutylbenzene - Extractable	2013/02/01		92	%	30 - 130	
		n-Dotriacontane - Extractable	2013/02/01		95	%	30 - 130	
		>C10-C16 Hydrocarbons	2013/02/01		79	%	30 - 130	
		>C16-C21 Hydrocarbons	2013/02/01		86	%	30 - 130	
	Spiked Blank	>C21-<C32 Hydrocarbons	2013/02/01		79	%	30 - 130	
		Isobutylbenzene - Extractable	2013/02/01		105	%	30 - 130	
		n-Dotriacontane - Extractable	2013/02/01		112	%	30 - 130	
		>C10-C16 Hydrocarbons	2013/02/01		80	%	30 - 130	
	Method Blank	>C16-C21 Hydrocarbons	2013/02/01		89	%	30 - 130	
		>C21-<C32 Hydrocarbons	2013/02/01		85	%	30 - 130	
		Isobutylbenzene - Extractable	2013/02/04		99	%	30 - 130	
		n-Dotriacontane - Extractable	2013/02/04		106	%	30 - 130	
	RPD	>C10-C16 Hydrocarbons	2013/02/04		<10		mg/kg	
		>C16-C21 Hydrocarbons	2013/02/04		<10		mg/kg	
>C21-<C32 Hydrocarbons		2013/02/04		<15		mg/kg		
>C10-C16 Hydrocarbons		2013/02/01		NC		%	50	
>C16-C21 Hydrocarbons		2013/02/01		NC		%	50	
3110288 THL	Matrix Spike [QJ8623-05]	>C21-<C32 Hydrocarbons	2013/02/01		NC	%	50	
		Isobutylbenzene - Volatile	2013/02/01		62	%	60 - 140	
		Benzene	2013/02/01		64	%	60 - 140	
		Toluene	2013/02/01		94	%	60 - 140	
		Ethylbenzene	2013/02/01		83	%	60 - 140	
	Spiked Blank	Xylene (Total)	2013/02/01		91	%	60 - 140	
		Isobutylbenzene - Volatile	2013/01/31		94	%	60 - 140	
		Benzene	2013/01/31		78	%	60 - 140	
		Toluene	2013/01/31		85	%	60 - 140	
	Method Blank	Ethylbenzene	2013/01/31		89	%	60 - 140	
		Xylene (Total)	2013/01/31		90	%	60 - 140	
		Isobutylbenzene - Volatile	2013/01/31		95	%	60 - 140	
		Benzene	2013/01/31		<0.0050		mg/kg	
	RPD [QJ8623-05]	Toluene	2013/01/31		<0.025		mg/kg	
Ethylbenzene		2013/01/31		<0.010		mg/kg		
Xylene (Total)		2013/01/31		<0.050		mg/kg		
C6 - C10 (less BTEX)		2013/01/31		<2.5		mg/kg		
Benzene		2013/01/31		NC		%	50	
3111245 DLB	Matrix Spike [QJ8624-02]	Toluene	2013/01/31		NC	%	50	
		Ethylbenzene	2013/01/31		NC	%	50	
		Xylene (Total)	2013/01/31		NC	%	50	
		C6 - C10 (less BTEX)	2013/01/31		NC	%	50	
		Acid Extractable Antimony (Sb)	2013/02/01		96	%	75 - 125	
		Acid Extractable Arsenic (As)	2013/02/01		96	%	75 - 125	
		Acid Extractable Barium (Ba)	2013/02/01		100	%	75 - 125	
		Acid Extractable Beryllium (Be)	2013/02/01		99	%	75 - 125	
		Acid Extractable Bismuth (Bi)	2013/02/01		100	%	75 - 125	
		Acid Extractable Boron (B)	2013/02/01		NC	%	75 - 125	
		Acid Extractable Cadmium (Cd)	2013/02/01		96	%	75 - 125	
		Acid Extractable Chromium (Cr)	2013/02/01		101	%	75 - 125	
		Acid Extractable Cobalt (Co)	2013/02/01		99	%	75 - 125	
		Acid Extractable Copper (Cu)	2013/02/01		99	%	75 - 125	
Acid Extractable Lead (Pb)	2013/02/01		100	%	75 - 125			
Acid Extractable Lithium (Li)	2013/02/01		107	%	75 - 125			
Acid Extractable Manganese (Mn)	2013/02/01		NC	%	75 - 125			
Acid Extractable Molybdenum (Mo)	2013/02/01		99	%	75 - 125			

CBCL Limited
 Attention: Peter Lane
 Client Project #: 131203.03
 P.O. #:
 Site Location: PINKNEYS POINT SCH

Quality Assurance Report (Continued)

Maxxam Job Number: DB314122

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3111245 DLB	Matrix Spike [QJ8624-02]	Acid Extractable Nickel (Ni)	2013/02/01		95	%	75 - 125
		Acid Extractable Rubidium (Rb)	2013/02/01		96	%	75 - 125
	Acid Extractable Selenium (Se)	2013/02/01		96	%	75 - 125	
	Acid Extractable Silver (Ag)	2013/02/01		97	%	75 - 125	
	Acid Extractable Strontium (Sr)	2013/02/01		NC	%	75 - 125	
	Acid Extractable Thallium (Tl)	2013/02/01		99	%	75 - 125	
	Acid Extractable Tin (Sn)	2013/02/01		97	%	75 - 125	
	Acid Extractable Uranium (U)	2013/02/01		105	%	75 - 125	
	Acid Extractable Vanadium (V)	2013/02/01		101	%	75 - 125	
	Acid Extractable Zinc (Zn)	2013/02/01		NC	%	75 - 125	
	Spiked Blank	Acid Extractable Antimony (Sb)	2013/02/01		100	%	75 - 125
		Acid Extractable Arsenic (As)	2013/02/01		97	%	75 - 125
		Acid Extractable Barium (Ba)	2013/02/01		97	%	75 - 125
		Acid Extractable Beryllium (Be)	2013/02/01		102	%	75 - 125
		Acid Extractable Bismuth (Bi)	2013/02/01		103	%	75 - 125
		Acid Extractable Boron (B)	2013/02/01		98	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/02/01		97	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/02/01		99	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/02/01		100	%	75 - 125
		Acid Extractable Copper (Cu)	2013/02/01		98	%	75 - 125
		Acid Extractable Lead (Pb)	2013/02/01		100	%	75 - 125
		Acid Extractable Lithium (Li)	2013/02/01		103	%	75 - 125
		Acid Extractable Manganese (Mn)	2013/02/01		97	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2013/02/01		100	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/02/01		96	%	75 - 125
		Acid Extractable Rubidium (Rb)	2013/02/01		96	%	75 - 125
		Acid Extractable Selenium (Se)	2013/02/01		96	%	75 - 125
		Acid Extractable Silver (Ag)	2013/02/01		97	%	75 - 125
		Acid Extractable Strontium (Sr)	2013/02/01		97	%	75 - 125
		Acid Extractable Thallium (Tl)	2013/02/01		101	%	75 - 125
	Acid Extractable Tin (Sn)	2013/02/01		99	%	75 - 125	
	Acid Extractable Uranium (U)	2013/02/01		105	%	75 - 125	
	Acid Extractable Vanadium (V)	2013/02/01		100	%	75 - 125	
	Acid Extractable Zinc (Zn)	2013/02/01		96	%	75 - 125	
Method Blank	Acid Extractable Aluminum (Al)	2013/02/01		<10		mg/kg	
	Acid Extractable Antimony (Sb)	2013/02/01		<2.0		mg/kg	
	Acid Extractable Arsenic (As)	2013/02/01		<2.0		mg/kg	
	Acid Extractable Barium (Ba)	2013/02/01		<5.0		mg/kg	
	Acid Extractable Beryllium (Be)	2013/02/01		<2.0		mg/kg	
	Acid Extractable Bismuth (Bi)	2013/02/01		<2.0		mg/kg	
	Acid Extractable Boron (B)	2013/02/01		<5.0		mg/kg	
	Acid Extractable Cadmium (Cd)	2013/02/01		<0.30		mg/kg	
	Acid Extractable Chromium (Cr)	2013/02/01		<2.0		mg/kg	
	Acid Extractable Cobalt (Co)	2013/02/01		<1.0		mg/kg	
	Acid Extractable Copper (Cu)	2013/02/01		<2.0		mg/kg	
	Acid Extractable Iron (Fe)	2013/02/01		<50		mg/kg	
	Acid Extractable Lead (Pb)	2013/02/01		<0.50		mg/kg	
	Acid Extractable Lithium (Li)	2013/02/01		<2.0		mg/kg	
	Acid Extractable Manganese (Mn)	2013/02/01		<2.0		mg/kg	
	Acid Extractable Molybdenum (Mo)	2013/02/01		<2.0		mg/kg	
	Acid Extractable Nickel (Ni)	2013/02/01		<2.0		mg/kg	
	Acid Extractable Rubidium (Rb)	2013/02/01		<2.0		mg/kg	
	Acid Extractable Selenium (Se)	2013/02/01		<1.0		mg/kg	
	Acid Extractable Silver (Ag)	2013/02/01		<0.50		mg/kg	

CBCL Limited
 Attention: Peter Lane
 Client Project #: 131203.03
 P.O. #:
 Site Location: PINKNEYS POINT SCH

Quality Assurance Report (Continued)

Maxxam Job Number: DB314122

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3111245 DLB	Method Blank	Acid Extractable Strontium (Sr)	2013/02/01	<5.0		mg/kg	
		Acid Extractable Thallium (Tl)	2013/02/01	<0.10		mg/kg	
		Acid Extractable Tin (Sn)	2013/02/01	<2.0		mg/kg	
		Acid Extractable Uranium (U)	2013/02/01	<0.10		mg/kg	
		Acid Extractable Vanadium (V)	2013/02/01	<2.0		mg/kg	
		Acid Extractable Zinc (Zn)	2013/02/01	<5.0		mg/kg	
	RPD [QJ8624-02]	Acid Extractable Aluminum (Al)	2013/02/01	2.5		%	35
		Acid Extractable Antimony (Sb)	2013/02/01	NC		%	35
		Acid Extractable Arsenic (As)	2013/02/01	NC		%	35
		Acid Extractable Barium (Ba)	2013/02/01	NC		%	35
		Acid Extractable Beryllium (Be)	2013/02/01	NC		%	35
		Acid Extractable Bismuth (Bi)	2013/02/01	NC		%	35
		Acid Extractable Boron (B)	2013/02/01	5.3		%	35
		Acid Extractable Cadmium (Cd)	2013/02/01	NC		%	35
		Acid Extractable Chromium (Cr)	2013/02/01	3.2		%	35
		Acid Extractable Cobalt (Co)	2013/02/01	NC		%	35
		Acid Extractable Copper (Cu)	2013/02/01	NC		%	35
		Acid Extractable Iron (Fe)	2013/02/01	1.8		%	35
		Acid Extractable Lead (Pb)	2013/02/01	7.6		%	35
		Acid Extractable Lithium (Li)	2013/02/01	1.7		%	35
		Acid Extractable Manganese (Mn)	2013/02/01	1.4		%	35
		Acid Extractable Molybdenum (Mo)	2013/02/01	NC		%	35
		Acid Extractable Nickel (Ni)	2013/02/01	1.9		%	35
		Acid Extractable Rubidium (Rb)	2013/02/01	1.4		%	35
		Acid Extractable Selenium (Se)	2013/02/01	NC		%	35
		Acid Extractable Silver (Ag)	2013/02/01	NC		%	35
		Acid Extractable Strontium (Sr)	2013/02/01	11.9		%	35
		Acid Extractable Thallium (Tl)	2013/02/01	NC		%	35
		Acid Extractable Tin (Sn)	2013/02/01	NC		%	35
		Acid Extractable Uranium (U)	2013/02/01	10.1		%	35
		Acid Extractable Vanadium (V)	2013/02/01	2.7		%	35
		Acid Extractable Zinc (Zn)	2013/02/01	2.1		%	35
3113123 KJO	Matrix Spike [QJ8623-02]	Decachlorobiphenyl	2013/02/08		91	%	70 - 130
		Total PCB	2013/02/08		116	%	70 - 130
	Spiked Blank	Decachlorobiphenyl	2013/02/08		86	%	70 - 130
		Total PCB	2013/02/08		100	%	70 - 130
	Method Blank	Decachlorobiphenyl	2013/02/08		91	%	70 - 130
		Total PCB	2013/02/08	<0.010		mg/kg	
	RPD [QJ8623-02]	Total PCB	2013/02/08	NC		%	50
3113313 DLB	Method Blank	Soluble (Hot Water) Boron (B)	2013/02/05	<0.30		mg/kg	
	RPD [QJ8624-02]	Soluble (Hot Water) Boron (B)	2013/02/05	1		%	25
3113347 GTH	Matrix Spike [QJ8623-02]	D10-Anthracene	2013/02/05		92	%	30 - 130
		D14-Terphenyl	2013/02/05		93	%	30 - 130
		D8-Acenaphthylene	2013/02/05		89	%	30 - 130
		1-Methylnaphthalene	2013/02/05		78	%	30 - 130
		2-Methylnaphthalene	2013/02/05		86	%	30 - 130
		Acenaphthene	2013/02/05		82	%	30 - 130
		Acenaphthylene	2013/02/05		83	%	30 - 130
		Anthracene	2013/02/05		NC	%	30 - 130
		Benzo(a)anthracene	2013/02/05		NC	%	30 - 130
		Benzo(a)pyrene	2013/02/05		NC	%	30 - 130
		Benzo(b)fluoranthene	2013/02/05		NC	%	30 - 130
		Benzo(g,h,i)perylene	2013/02/05		86	%	30 - 130

CBCL Limited
 Attention: Peter Lane
 Client Project #: 131203.03
 P.O. #:
 Site Location: PINKNEYS POINT SCH

Quality Assurance Report (Continued)

Maxxam Job Number: DB314122

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3113347 GTH	Matrix Spike [QJ8623-02]	Benzo(j)fluoranthene	2013/02/05		87	%	30 - 130
		Benzo(k)fluoranthene	2013/02/05		82	%	30 - 130
		Chrysene	2013/02/05		NC	%	30 - 130
		Dibenz(a,h)anthracene	2013/02/05		85	%	30 - 130
		Fluoranthene	2013/02/05		NC	%	30 - 130
		Fluorene	2013/02/05		85	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/02/05		83	%	30 - 130
		Naphthalene	2013/02/05		82	%	30 - 130
		Perylene	2013/02/05		85	%	30 - 130
		Phenanthrene	2013/02/05		NC	%	30 - 130
		Pyrene	2013/02/05		NC	%	30 - 130
	Spiked Blank	D10-Anthracene	2013/02/05		96	%	30 - 130
		D14-Terphenyl	2013/02/05		98	%	30 - 130
		D8-Acenaphthylene	2013/02/05		84	%	30 - 130
		1-Methylnaphthalene	2013/02/05		81	%	30 - 130
		2-Methylnaphthalene	2013/02/05		86	%	30 - 130
		Acenaphthene	2013/02/05		86	%	30 - 130
		Acenaphthylene	2013/02/05		76	%	30 - 130
		Anthracene	2013/02/05		114	%	30 - 130
		Benzo(a)anthracene	2013/02/05		102	%	30 - 130
		Benzo(a)pyrene	2013/02/05		85	%	30 - 130
		Benzo(b)fluoranthene	2013/02/05		83	%	30 - 130
		Benzo(g,h,i)perylene	2013/02/05		92	%	30 - 130
		Benzo(j)fluoranthene	2013/02/05		91	%	30 - 130
		Benzo(k)fluoranthene	2013/02/05		86	%	30 - 130
		Chrysene	2013/02/05		99	%	30 - 130
		Dibenz(a,h)anthracene	2013/02/05		86	%	30 - 130
		Fluoranthene	2013/02/05		95	%	30 - 130
		Fluorene	2013/02/05		87	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2013/02/05		88	%	30 - 130
		Naphthalene	2013/02/05		89	%	30 - 130
		Perylene	2013/02/05		87	%	30 - 130
		Phenanthrene	2013/02/05		92	%	30 - 130
		Pyrene	2013/02/05		101	%	30 - 130
	Method Blank	D10-Anthracene	2013/02/05		102	%	30 - 130
		D14-Terphenyl	2013/02/05		101	%	30 - 130
		D8-Acenaphthylene	2013/02/05		86	%	30 - 130
		1-Methylnaphthalene	2013/02/05	<0.0050		mg/kg	
		2-Methylnaphthalene	2013/02/05	<0.0050		mg/kg	
		Acenaphthene	2013/02/05	<0.0050		mg/kg	
		Acenaphthylene	2013/02/05	<0.0050		mg/kg	
		Anthracene	2013/02/05	<0.0050		mg/kg	
		Benzo(a)anthracene	2013/02/05	<0.0050		mg/kg	
		Benzo(a)pyrene	2013/02/05	<0.0050		mg/kg	
		Benzo(b)fluoranthene	2013/02/05	<0.0050		mg/kg	
		Benzo(g,h,i)perylene	2013/02/05	<0.0050		mg/kg	
		Benzo(j)fluoranthene	2013/02/05	<0.0050		mg/kg	
		Benzo(k)fluoranthene	2013/02/05	<0.0050		mg/kg	
		Chrysene	2013/02/05	<0.0050		mg/kg	
		Dibenz(a,h)anthracene	2013/02/05	<0.0050		mg/kg	
		Fluoranthene	2013/02/05	<0.0050		mg/kg	
		Fluorene	2013/02/05	<0.0050		mg/kg	
		Indeno(1,2,3-cd)pyrene	2013/02/05	<0.0050		mg/kg	
		Naphthalene	2013/02/05	<0.0050		mg/kg	

CBCL Limited
 Attention: Peter Lane
 Client Project #: 131203.03
 P.O. #:
 Site Location: PINKNEYS POINT SCH

Quality Assurance Report (Continued)

Maxxam Job Number: DB314122

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3113347	GTH	Method Blank	2013/02/05	<0.0050		mg/kg	
		Perylene	2013/02/05	<0.0050		mg/kg	
		Phenanthrene	2013/02/05	<0.0050		mg/kg	
		Pyrene	2013/02/05	<0.0050		mg/kg	
	RPD [QJ8623-02]	1-Methylnaphthalene	2013/02/05	NC		%	50
		2-Methylnaphthalene	2013/02/05	NC		%	50
		Acenaphthene	2013/02/05	NC		%	50
		Acenaphthylene	2013/02/05	NC		%	50
		Anthracene	2013/02/05	NC		%	50
		Benzo(a)anthracene	2013/02/05	121 (1)		%	50
		Benzo(a)pyrene	2013/02/05	98.9 (1)		%	50
		Benzo(b)fluoranthene	2013/02/05	81.7 (1)		%	50
		Benzo(g,h,i)perylene	2013/02/05	NC		%	50
		Benzo(j)fluoranthene	2013/02/05	NC		%	50
		Benzo(k)fluoranthene	2013/02/05	NC		%	50
		Chrysene	2013/02/05	83.1 (1)		%	50
		Dibenz(a,h)anthracene	2013/02/05	NC		%	50
		Fluoranthene	2013/02/05	126 (1)		%	50
		Fluorene	2013/02/05	NC		%	50
		Indeno(1,2,3-cd)pyrene	2013/02/05	NC		%	50
		Naphthalene	2013/02/05	NC		%	50
		Perylene	2013/02/05	NC		%	50
		Phenanthrene	2013/02/05	156 (1)		%	50
		Pyrene	2013/02/05	129 (1)		%	50
3114262	MKH	Matrix Spike [QJ8624-02]	2013/02/05		103	%	75 - 125
		QC Standard	2013/02/05		94	%	75 - 125
		Spiked Blank	2013/02/05		101	%	75 - 125
		Method Blank	2013/02/05	<0.010		mg/kg	
	RPD [QJ8624-02]	Mercury (Hg)	2013/02/05	NC		%	35
3115123	SAC	Matrix Spike	2013/02/07		101	%	75 - 125
		QC Standard	2013/02/07		106	%	75 - 125
		Spiked Blank	2013/02/07		103	%	80 - 120
		Method Blank	2013/02/07	<0.2		ug/g	
	RPD	Chromium (VI)	2013/02/07	NC		%	35
3115408	CAC	QC Standard	2013/02/06		88	%	75 - 125
		Method Blank	2013/02/06	<0.20		g/kg	
	RPD	Organic Carbon (TOC)	2013/02/06	2.9		%	35
3115441	MAK	Matrix Spike	2013/02/08		94	%	50 - 130
		Decachlorobiphenyl	2013/02/08		87	%	50 - 130
		Aldrin	2013/02/08		115	%	50 - 130
		a-Chlordane	2013/02/08		96	%	50 - 130
		g-Chlordane	2013/02/08		105	%	50 - 130
		o,p-DDD	2013/02/08		110	%	50 - 130
		p,p-DDD	2013/02/08		105	%	50 - 130
		o,p-DDE	2013/02/08		110	%	50 - 130
		p,p-DDE	2013/02/08		115	%	50 - 130
		o,p-DDT	2013/02/08		105	%	50 - 130
		p,p-DDT	2013/02/08		136 (2)	%	50 - 130
		Dieldrin	2013/02/08		113	%	50 - 130
		Lindane	2013/02/08		113	%	50 - 130
		Endosulfan I (alpha)	2013/02/08		76	%	50 - 130
		Endosulfan II	2013/02/08		75	%	50 - 130
		Endrin	2013/02/08		114	%	50 - 130
		Heptachlor	2013/02/08		128	%	50 - 130
		Heptachlor epoxide	2013/02/08		100	%	50 - 130

CBCL Limited
 Attention: Peter Lane
 Client Project #: 131203.03
 P.O. #:
 Site Location: PINKNEYS POINT SCH

Quality Assurance Report (Continued)

Maxxam Job Number: DB314122

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits	
3115441 MAK	Matrix Spike	Hexachlorobenzene	2013/02/08		99	%	50 - 130	
		Methoxychlor	2013/02/08		144 (2)	%	50 - 130	
		alpha-BHC	2013/02/08		116	%	30 - 130	
		beta-BHC	2013/02/08		109	%	30 - 130	
		delta-BHC	2013/02/08		110	%	30 - 130	
		Endosulfan sulfate	2013/02/08		128	%	30 - 130	
		Endrin aldehyde	2013/02/08		76	%	30 - 130	
		Endrin ketone	2013/02/08		113	%	30 - 130	
		Mirex	2013/02/08		99	%	30 - 130	
		Octachlorostyrene	2013/02/08		119	%	30 - 130	
		Spiked Blank	2,4,5,6-Tetrachloro-m-xylene	2013/02/08		84	%	50 - 130
			Decachlorobiphenyl	2013/02/08		84	%	50 - 130
			Aldrin	2013/02/08		88	%	50 - 130
			a-Chlordane	2013/02/08		83	%	50 - 130
			g-Chlordane	2013/02/08		88	%	50 - 130
	o,p-DDD		2013/02/08		95	%	50 - 130	
	p,p-DDD		2013/02/08		98	%	50 - 130	
	o,p-DDE		2013/02/08		89	%	50 - 130	
	p,p-DDE		2013/02/08		108	%	50 - 130	
	o,p-DDT		2013/02/08		94	%	50 - 130	
	p,p-DDT		2013/02/08		114	%	50 - 130	
	Dieldrin		2013/02/08		96	%	50 - 130	
	Lindane		2013/02/08		101	%	50 - 130	
	Endosulfan I (alpha)		2013/02/08		68	%	50 - 130	
	Endosulfan II		2013/02/08		70	%	50 - 130	
	Endrin		2013/02/08		100	%	50 - 130	
	Heptachlor		2013/02/08		112	%	50 - 130	
	Heptachlor epoxide		2013/02/08		87	%	50 - 130	
	Hexachlorobenzene	2013/02/08		85	%	50 - 130		
	Methoxychlor	2013/02/08		134 (2)	%	50 - 130		
	RPD Spiked Blank	Aroclor 1242	2013/02/08		NC	%	40	
		alpha-BHC	2013/02/08		103	%	30 - 130	
		beta-BHC	2013/02/08		93	%	30 - 130	
delta-BHC		2013/02/08		99	%	30 - 130		
Endosulfan sulfate		2013/02/08		114	%	30 - 130		
Endrin aldehyde		2013/02/08		83	%	30 - 130		
Endrin ketone		2013/02/08		100	%	30 - 130		
Mirex		2013/02/08		85	%	30 - 130		
Octachlorostyrene		2013/02/08		93	%	30 - 130		
RPD Method Blank		Toxaphene	2013/02/08		NC	%	50	
	2,4,5,6-Tetrachloro-m-xylene	2013/02/08		78	%	50 - 130		
	Decachlorobiphenyl	2013/02/08		82	%	50 - 130		
	Aldrin	2013/02/08	<0.0020		ug/g			
	a-Chlordane	2013/02/08	<0.0020		ug/g			
	g-Chlordane	2013/02/08	<0.0020		ug/g			
	Chlordane (Total)	2013/02/08	<0.0020		ug/g			
	o,p-DDD	2013/02/08	<0.0020		ug/g			
	p,p-DDD	2013/02/08	<0.0020		ug/g			
	o,p-DDD + p,p-DDD	2013/02/08	<0.0020		ug/g			
	o,p-DDE	2013/02/08	<0.0020		ug/g			
	p,p-DDE	2013/02/08	<0.0020		ug/g			
	o,p-DDE + p,p-DDE	2013/02/08	<0.0020		ug/g			
	o,p-DDT	2013/02/08	<0.0020		ug/g			
	p,p-DDT	2013/02/08	<0.0020		ug/g			
	o,p-DDT + p,p-DDT	2013/02/08	<0.0020		ug/g			

CBCL Limited
 Attention: Peter Lane
 Client Project #: 131203.03
 P.O. #:
 Site Location: PINKNEYS POINT SCH

Quality Assurance Report (Continued)

Maxxam Job Number: DB314122

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3115441 MAK	Method Blank	DDT+ Metabolites	2013/02/08	<0.0020		ug/g	
		Dieldrin	2013/02/08	<0.0020		ug/g	
		Lindane	2013/02/08	<0.0020		ug/g	
		Endosulfan I (alpha)	2013/02/08	<0.0020		ug/g	
		Endosulfan II	2013/02/08	<0.0020		ug/g	
		Total Endosulfan	2013/02/08	<0.0020		ug/g	
		Endrin	2013/02/08	<0.0020		ug/g	
		Heptachlor	2013/02/08	<0.0020		ug/g	
		Heptachlor epoxide	2013/02/08	<0.0020		ug/g	
		Hexachlorobenzene	2013/02/08	<0.0020		ug/g	
		Methoxychlor	2013/02/08	<0.0050		ug/g	
		Aroclor 1016	2013/02/08	<0.015		ug/g	
		Aroclor 1221	2013/02/08	<0.015		ug/g	
		Aroclor 1232	2013/02/08	<0.015		ug/g	
		Aroclor 1242	2013/02/08	<0.015		ug/g	
		Aroclor 1248	2013/02/08	<0.015		ug/g	
		Aroclor 1254	2013/02/08	<0.015		ug/g	
		Aroclor 1260	2013/02/08	<0.015		ug/g	
		Aroclor 1262	2013/02/08	<0.015		ug/g	
		Aroclor 1268	2013/02/08	<0.015		ug/g	
		alpha-BHC	2013/02/08	<0.0020		ug/g	
		beta-BHC	2013/02/08	<0.0020		ug/g	
		delta-BHC	2013/02/08	<0.0020		ug/g	
		Endosulfan sulfate	2013/02/08	<0.0020		ug/g	
		Endrin aldehyde	2013/02/08	<0.0020		ug/g	
		Endrin ketone	2013/02/08	<0.0020		ug/g	
		Mirex	2013/02/08	<0.0020		ug/g	
		Octachlorostyrene	2013/02/08	<0.0020		ug/g	
		Toxaphene	2013/02/08	<0.080		ug/g	
	RPD	Aldrin	2013/02/08	NC		%	40
		a-Chlordane	2013/02/08	NC		%	40
		g-Chlordane	2013/02/08	NC		%	40
		Chlordane (Total)	2013/02/08	NC		%	40
		o,p-DDD	2013/02/08	NC		%	40
		p,p-DDD	2013/02/08	NC		%	40
		o,p-DDD + p,p-DDD	2013/02/08	NC		%	40
		o,p-DDE	2013/02/08	NC		%	40
		p,p-DDE	2013/02/08	NC		%	40
		o,p-DDE + p,p-DDE	2013/02/08	NC		%	40
		o,p-DDT	2013/02/08	NC		%	40
		p,p-DDT	2013/02/08	NC		%	40
		o,p-DDT + p,p-DDT	2013/02/08	NC		%	40
		Dieldrin	2013/02/08	NC		%	40
		Lindane	2013/02/08	NC		%	40
		Endosulfan I (alpha)	2013/02/08	NC		%	40
		Endosulfan II	2013/02/08	NC		%	40
		Total Endosulfan	2013/02/08	NC		%	40
		Endrin	2013/02/08	NC		%	40
		Heptachlor	2013/02/08	NC		%	40
		Heptachlor epoxide	2013/02/08	NC		%	40
		Hexachlorobenzene	2013/02/08	NC		%	40
		Methoxychlor	2013/02/08	NC		%	40
		Aroclor 1248	2013/02/08	NC		%	40
		Aroclor 1254	2013/02/08	NC		%	40
		Aroclor 1260	2013/02/08	NC		%	40

CBCL Limited
 Attention: Peter Lane
 Client Project #: 131203.03
 P.O. #:
 Site Location: PINKNEYS POINT SCH

Quality Assurance Report (Continued)

Maxxam Job Number: DB314122

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3116707 BBD	QC Standard	Organic Carbon (TOC)	2013/02/07		96	%	75 - 125
	Method Blank	Organic Carbon (TOC)	2013/02/07	<0.20		g/kg	
	RPD	Organic Carbon (TOC)	2013/02/07	13.6		%	35
3116777 ZZH	QC Standard	Total Carbon-combustion IR	2013/02/07		96	%	75 - 125
	Method Blank	Total Carbon-combustion IR	2013/02/07	<0.20		g/kg	
	RPD [QJ8624-02]	Total Carbon-combustion IR	2013/02/07	0.4		%	35
3118538 CAC	QC Standard	Total Carbon-combustion IR	2013/02/08		97	%	75 - 125
	Method Blank	Total Carbon-combustion IR	2013/02/08	<0.20		g/kg	
	RPD	Total Carbon-combustion IR	2013/02/08	1.9		%	35
3119544 BAN	RPD [QJ8623-02]	Gravel	2013/02/11	NC		%	25
		Sand	2013/02/11	1.1		%	25
		Silt	2013/02/11	3.0		%	25
		Clay	2013/02/11	10.8		%	25
3124960 KCA	Method Blank	Sample Weight (as received)	2013/02/15	NA		g	
	RPD	Sample Weight (as received)	2013/02/15	0		%	N/A
3124962 KCA	Method Blank	Final pH	2013/02/15	4.25		N/A	
	RPD	Final pH	2013/02/15	0.6		%	N/A
3126680 GTH	Leachate Blank	Leachable D10-Anthracene	2013/02/20		99	%	30 - 130
		Leachable D14-Terphenyl	2013/02/20		106	%	30 - 130
		Leachable D8-Acenaphthylene	2013/02/20		95	%	30 - 130
		Leachable 1-Methylnaphthalene	2013/02/20	<0.010		ug/L	
		Leachable 2-Methylnaphthalene	2013/02/20	<0.010		ug/L	
		Leachable Acenaphthene	2013/02/20	<0.0050		ug/L	
		Leachable Acenaphthylene	2013/02/20	<0.0050		ug/L	
		Leachable Anthracene	2013/02/20	<0.0050		ug/L	
		Leachable Benzo(a)anthracene	2013/02/20	<0.0050		ug/L	
		Leachable Benzo(a)pyrene	2013/02/20	<0.0050		ug/L	
		Leachable Benzo(b)fluoranthene	2013/02/20	<0.0050		ug/L	
		Leachable Benzo(g,h,i)perylene	2013/02/20	<0.0050		ug/L	
		Leachable Benzo(j)fluoranthene	2013/02/20	<0.0050		ug/L	
		Leachable Benzo(k)fluoranthene	2013/02/20	<0.0050		ug/L	
		Leachable Chrysene	2013/02/20	<0.0050		ug/L	
		Leachable Dibenz(a,h)anthracene	2013/02/20	<0.0050		ug/L	
		Leachable Fluoranthene	2013/02/20	<0.0050		ug/L	
		Leachable Fluorene	2013/02/20	<0.0050		ug/L	
		Leachable Indeno(1,2,3-cd)pyrene	2013/02/20	<0.0050		ug/L	
		Leachable Naphthalene	2013/02/20	<0.020		ug/L	
		Leachable Perylene	2013/02/20	<0.0050		ug/L	
		Leachable Phenanthrene	2013/02/20	<0.0050		ug/L	
		Leachable Pyrene	2013/02/20	<0.0050		ug/L	
	Spiked Blank	Leachable D10-Anthracene	2013/02/13		95	%	30 - 130
		Leachable D14-Terphenyl	2013/02/13		97	%	30 - 130
		Leachable D8-Acenaphthylene	2013/02/13		94	%	30 - 130
		Leachable 1-Methylnaphthalene	2013/02/13		85	%	30 - 130
		Leachable 2-Methylnaphthalene	2013/02/13		92	%	30 - 130
		Leachable Acenaphthene	2013/02/13		96	%	30 - 130
		Leachable Acenaphthylene	2013/02/13		97	%	30 - 130
		Leachable Anthracene	2013/02/13		92	%	30 - 130
		Leachable Benzo(a)anthracene	2013/02/13		100	%	30 - 130
		Leachable Benzo(a)pyrene	2013/02/13		101	%	30 - 130
		Leachable Benzo(b)fluoranthene	2013/02/13		98	%	30 - 130
		Leachable Benzo(g,h,i)perylene	2013/02/13		101	%	30 - 130
		Leachable Benzo(j)fluoranthene	2013/02/13		98	%	30 - 130
		Leachable Benzo(k)fluoranthene	2013/02/13		99	%	30 - 130
		Leachable Chrysene	2013/02/13		101	%	30 - 130

CBCL Limited
 Attention: Peter Lane
 Client Project #: 131203.03
 P.O. #:
 Site Location: PINKNEYS POINT SCH

Quality Assurance Report (Continued)

Maxxam Job Number: DB314122

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits	
3126680 GTH	Spiked Blank	Leachable Dibenz(a,h)anthracene	2013/02/13		91	%	30 - 130	
		Leachable Fluoranthene	2013/02/13		98	%	30 - 130	
		Leachable Fluorene	2013/02/13		95	%	30 - 130	
		Leachable Indeno(1,2,3-cd)pyrene	2013/02/13		97	%	30 - 130	
		Leachable Naphthalene	2013/02/13		79	%	30 - 130	
		Leachable Perylene	2013/02/13		99	%	30 - 130	
		Leachable Phenanthrene	2013/02/13		100	%	30 - 130	
		Leachable Pyrene	2013/02/13		97	%	30 - 130	
		Method Blank	Leachable D10-Anthracene	2013/02/20		96	%	30 - 130
			Leachable D14-Terphenyl	2013/02/20		100	%	30 - 130
	Leachable D8-Acenaphthylene		2013/02/20		95	%	30 - 130	
	Leachable 1-Methylnaphthalene		2013/02/20	<0.010			ug/L	
	Leachable 2-Methylnaphthalene		2013/02/20	<0.010			ug/L	
	Leachable Acenaphthene		2013/02/20	<0.0050			ug/L	
	Leachable Acenaphthylene		2013/02/20	<0.0050			ug/L	
	Leachable Anthracene		2013/02/20	<0.0050			ug/L	
	Leachable Benzo(a)anthracene		2013/02/20	<0.0050			ug/L	
	Leachable Benzo(a)pyrene		2013/02/20	<0.0050			ug/L	
	RPD	Leachable Benzo(b)fluoranthene	2013/02/20	<0.0050			ug/L	
		Leachable Benzo(g,h,i)perylene	2013/02/20	<0.0050			ug/L	
		Leachable Benzo(j)fluoranthene	2013/02/20	<0.0050			ug/L	
		Leachable Benzo(k)fluoranthene	2013/02/20	<0.0050			ug/L	
		Leachable Chrysene	2013/02/20	<0.0050			ug/L	
		Leachable Dibenz(a,h)anthracene	2013/02/20	<0.0050			ug/L	
		Leachable Fluoranthene	2013/02/20	<0.0050			ug/L	
		Leachable Fluorene	2013/02/20	<0.0050			ug/L	
		Leachable Indeno(1,2,3-cd)pyrene	2013/02/20	<0.0050			ug/L	
		Leachable Naphthalene	2013/02/20	<0.020			ug/L	
		Leachable Perylene	2013/02/20	<0.0050			ug/L	
		Leachable Phenanthrene	2013/02/20	<0.0050			ug/L	
		Leachable Pyrene	2013/02/20	<0.0050			ug/L	
		Leachable 1-Methylnaphthalene	2013/02/20	NC			%	40
		Leachable 2-Methylnaphthalene	2013/02/20	NC			%	40
		Leachable Acenaphthene	2013/02/20	NC			%	40
		Leachable Acenaphthylene	2013/02/20	NC			%	40
Leachable Anthracene		2013/02/20	NC			%	40	
Leachable Benzo(a)anthracene		2013/02/20	NC			%	40	
Leachable Benzo(a)pyrene		2013/02/20	NC			%	40	
Leachable Benzo(b)fluoranthene		2013/02/20	NC			%	40	
Leachable Benzo(g,h,i)perylene		2013/02/20	NC			%	40	
Leachable Benzo(j)fluoranthene		2013/02/20	NC			%	40	
Leachable Benzo(k)fluoranthene		2013/02/20	NC			%	40	
Leachable Chrysene		2013/02/20	NC			%	40	
Leachable Dibenz(a,h)anthracene	2013/02/20	NC			%	40		
Leachable Fluoranthene	2013/02/20	3.6			%	40		
Leachable Fluorene	2013/02/20	4.4			%	40		
Leachable Indeno(1,2,3-cd)pyrene	2013/02/20	NC			%	40		
Leachable Naphthalene	2013/02/20	NC			%	40		
Leachable Perylene	2013/02/20	NC			%	40		
Leachable Phenanthrene	2013/02/20	NC			%	40		
Leachable Pyrene	2013/02/20	3.8			%	40		

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.

CBCL Limited
Attention: Peter Lane
Client Project #: 131203.03
P.O. #:
Site Location: PINKNEYS POINT SCH

Quality Assurance Report (Continued)

Maxxam Job Number: DB314122

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

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: results are outside acceptance limit. Analysis was repeated with similar results.

(2) The recovery was above the upper control limit. This may represent a high bias in some results for this specific analyte. For results that were not detected (ND), this potential bias has no impact.

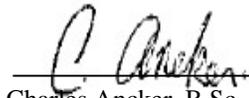
Validation Signature Page

Maxxam Job #: B314122

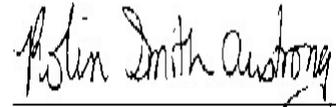
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



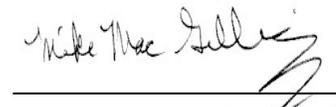
Colleen Acker, Supervisor, General Chemistry



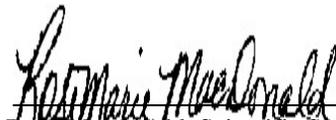
Charles Ancker, B.Sc., M.Sc., C.Chem, Senior Analyst



Robin Smith-Armstrong, Bedford SemiVol Spvsr



Mike Macgillivray, Scientific Specialist (Inorganics)



Rose Macdonald, Scientific Specialist (Organics)

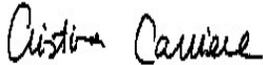
Validation Signature Page

Maxxam Job #: B314122

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



Alan Stewart, Scientific Specialist (Organics)



Cristina Carriere, Scientific Services

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.

This column for lab use only		INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):				TURNAROUND TIME	
Client Code 41018		Company Name: CBCL Limited		Company Name: _____				Project # / Phase # 131203.03	
Maxxam Job# B314122		Contact Name: Peter Lane		Contact Name: _____				Project Name / Site Location Pinkneys Point SCH	
Cooler Id Seal Present Seal Intact Temp 1 Temp 2 Temp 3 Average Temp		Address: 1489 Hollis Street B3J 2R7		Address: _____				Quote	
		Halifax, NS B3J 2R7		Postal Code: _____				Site #	
		Email: peterlane@cbcl.ca		Email: _____				Task Order#	
		Ph: 421-7241 Fax: 423-3938		Ph: _____ Fax: _____				Sampled by Connors Diving	
Integrity YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Integrity Checked by: AW		Guideline Requirements/ Detection Limits/ Special Instructions FOR PWGSC CCME low level PAHs (including a scan for cresole), low level BTEX / TPH (including silica gel clean-up) CCME DDT, PCBs to 0.01 mg/kg SPLP leachate may be required after review of the sample results Submit Partial Results as they become available Lowest detection limits possible for all samples. * Specify Matrix; Surface/Salt/Ground/Tapwater/Sewage/Effluent/ Potable/NonPotable/Tissue/Soil/Sludge/Metal/Seawater		Field Filtered & Preserved		Lab Filtration Required		Metals	
Labelled by: _____ Location/Bin# _____				RCAP-30 Choose Total or Diss Metals		RCAP-MS Choose Total or Diss Metals		Total Digest (Default Method) for well water, surface water	
		Temp 1: 0 Temp 2: 2 Temp 3: 2 Average Temp: 2		Metals Water		Metals Soil		Hydrocarbons	
		Field Sample Identification		Matrix *		Date/Time Sampled		# & type of bottles	
		1 SS-P07		Sediment		29 th			
		2 SS-P16		Sediment					
		3 SS-P24		Sediment					
		4 SS-P25		Sediment					
		5 SS-P35		Sediment					
		6							
		7							
		8							
		9							
		10							
RELINQUISHED BY: (Signature/Print)		Date		Time		RECEIVED BY: (Signature/Print)		Date	
		Jan 29/13		1559				2013 JAN 29 PM 3:57	

White: Maxxam

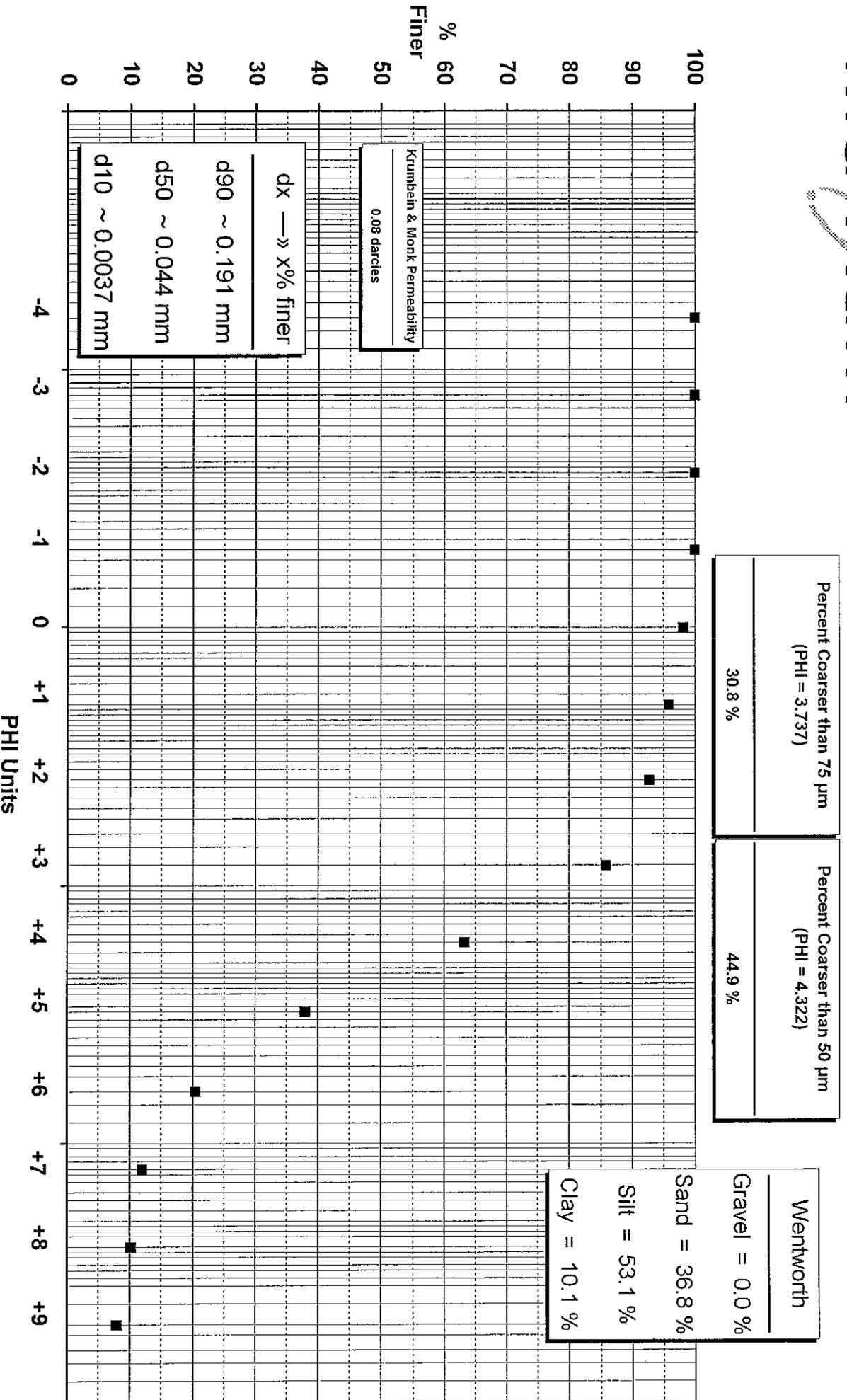
Yellow: Mail

Pink: Client

ATL FCD 00149 / Revision 9

SS-P07

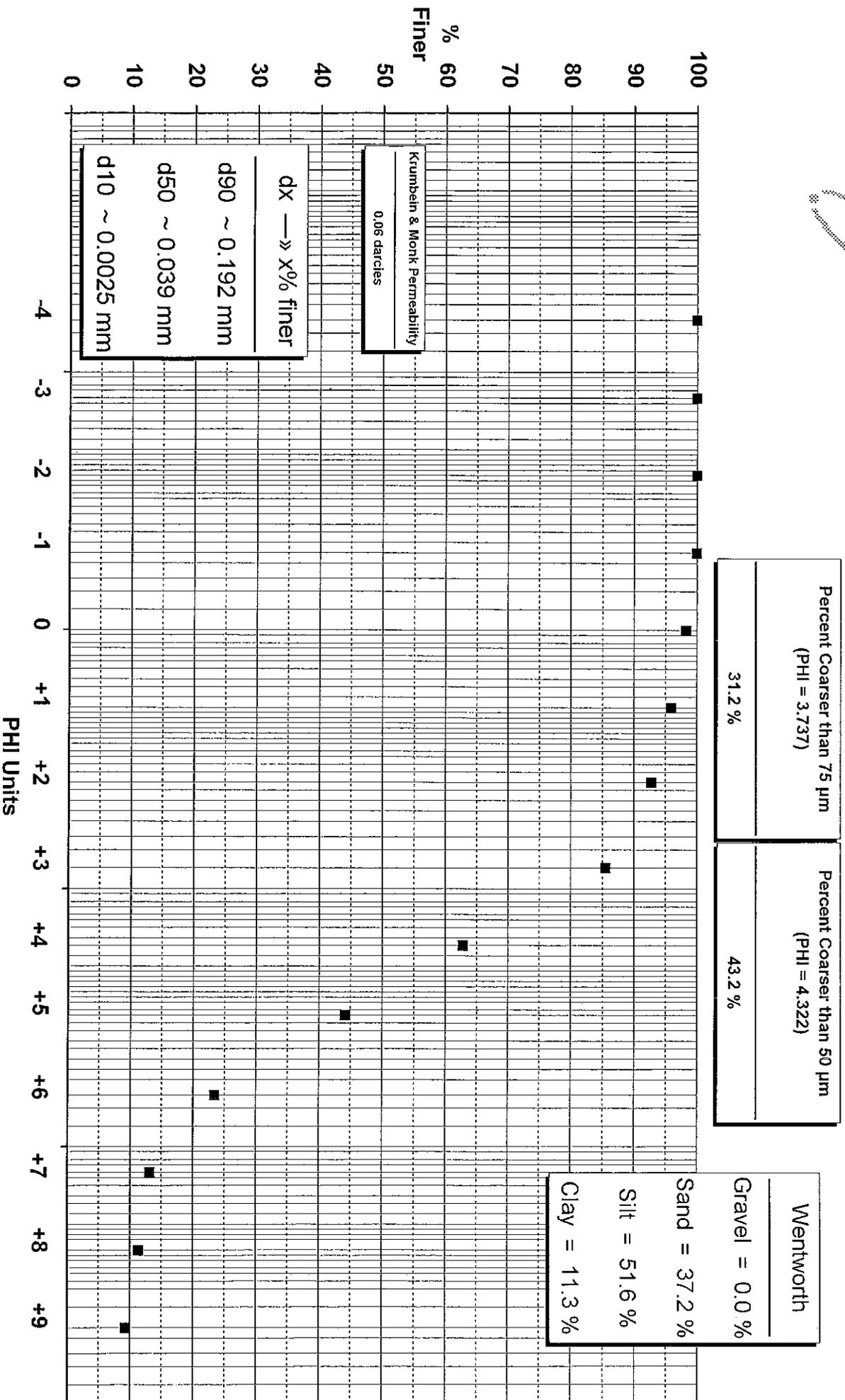
Maxxam ID: QJ8623-02



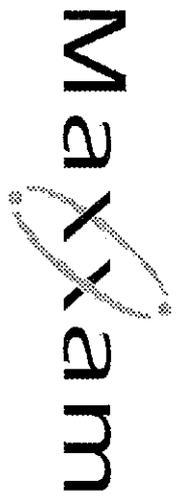
[Signature]
Approved

SS-P07:D1

Maxxam ID: QJ8623-02:D1



M. M. Co
Approved

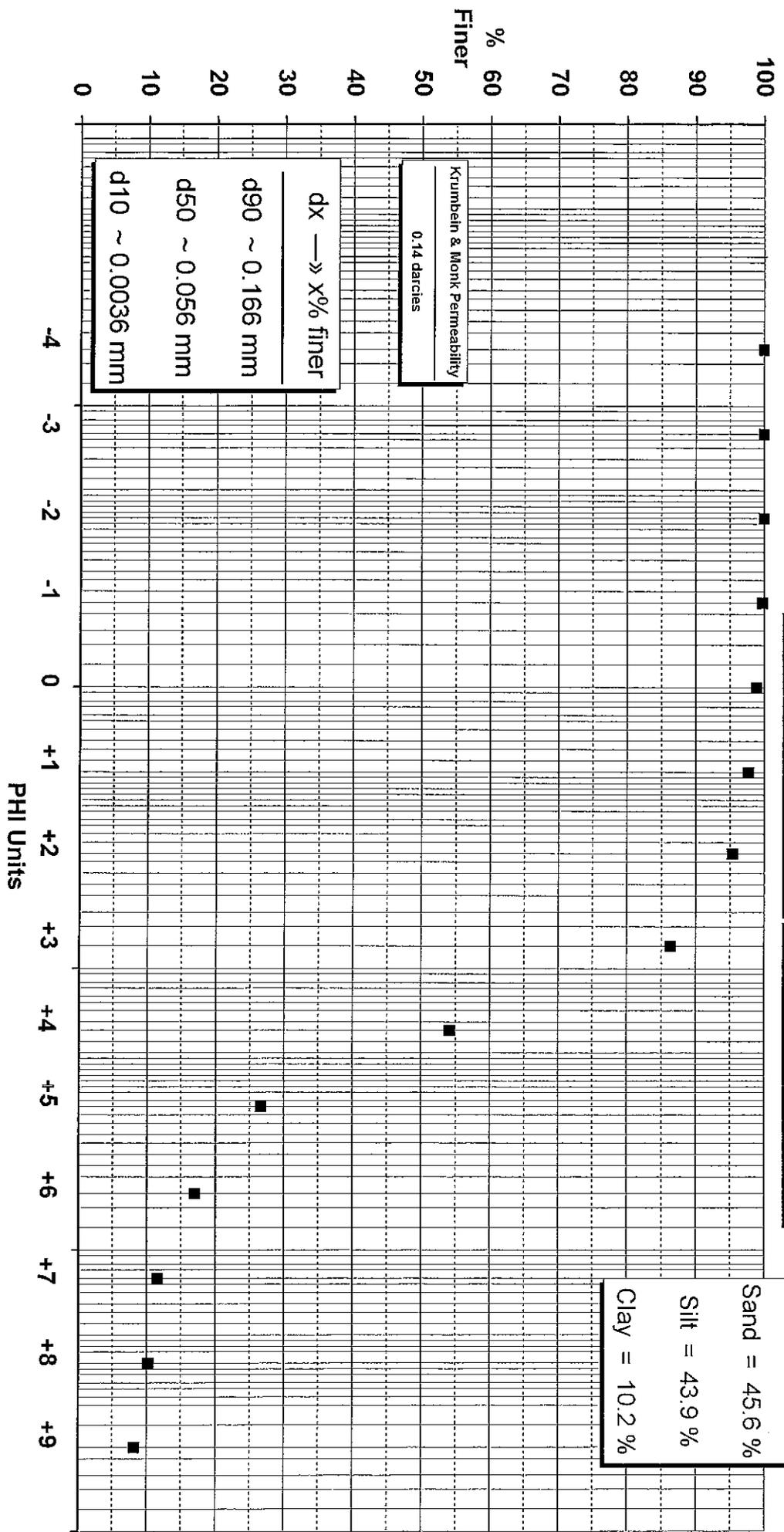


SS-P16

Maxxam ID: QJ8624-02

Percent Coarser than 75 µm (PHI = 3.737)	Percent Coarser than 50 µm (PHI = 4.322)
37.4 %	54.7 %

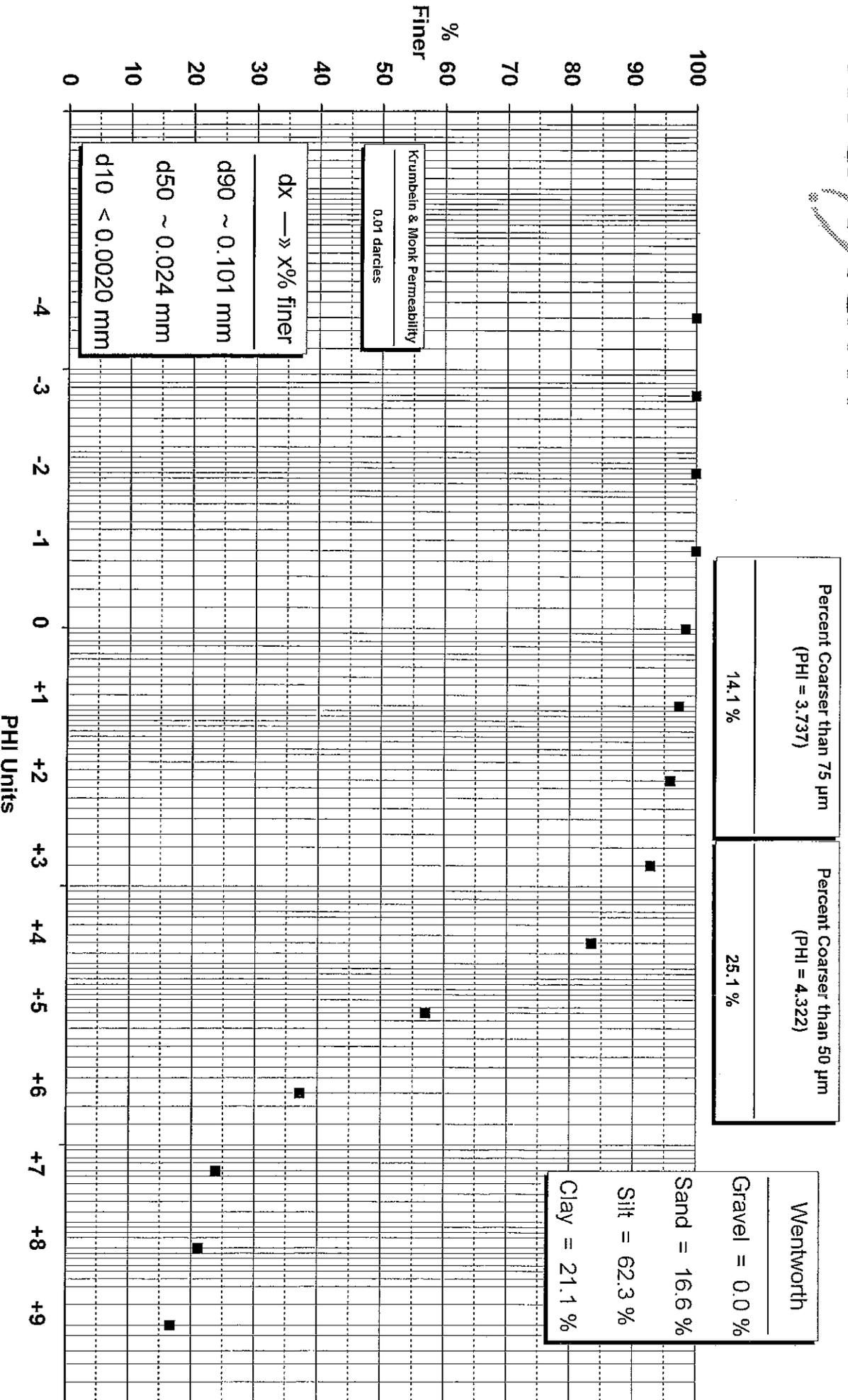
Wentworth
Gravel = 0.3 %
Sand = 45.6 %
Silt = 43.9 %
Clay = 10.2 %



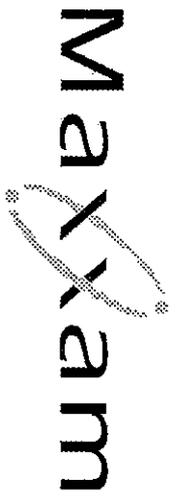
M. S. [Signature]
Approved

SS-P24

Maxxam ID: QJ8625-02



[Signature]
Approved

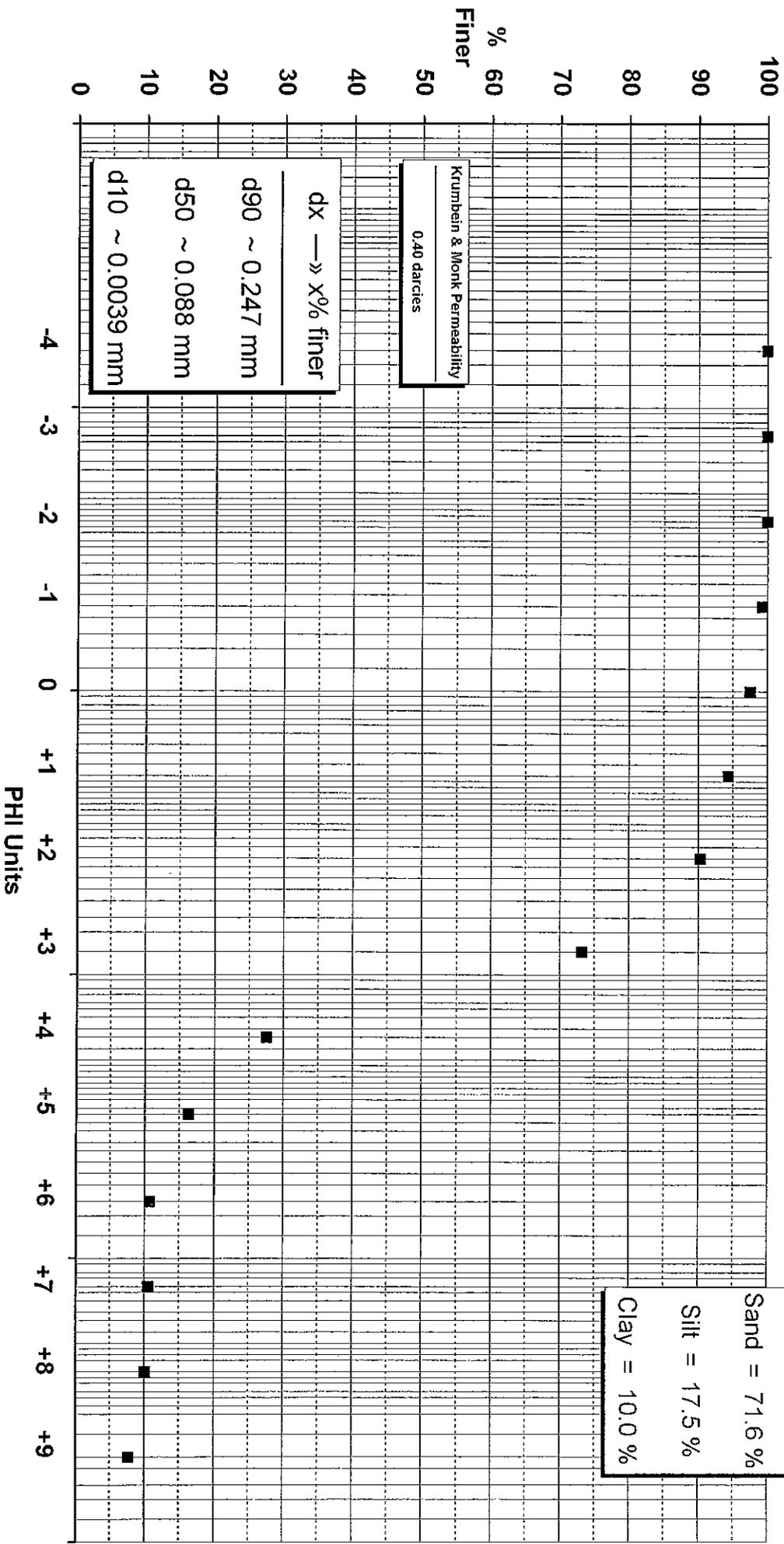


SS-P25

Maxxam ID: QJ8626-02

Percent Coarser than 75 µm (PHI = 3.737)	Percent Coarser than 50 µm (PHI = 4.322)
60.4 %	76.1 %

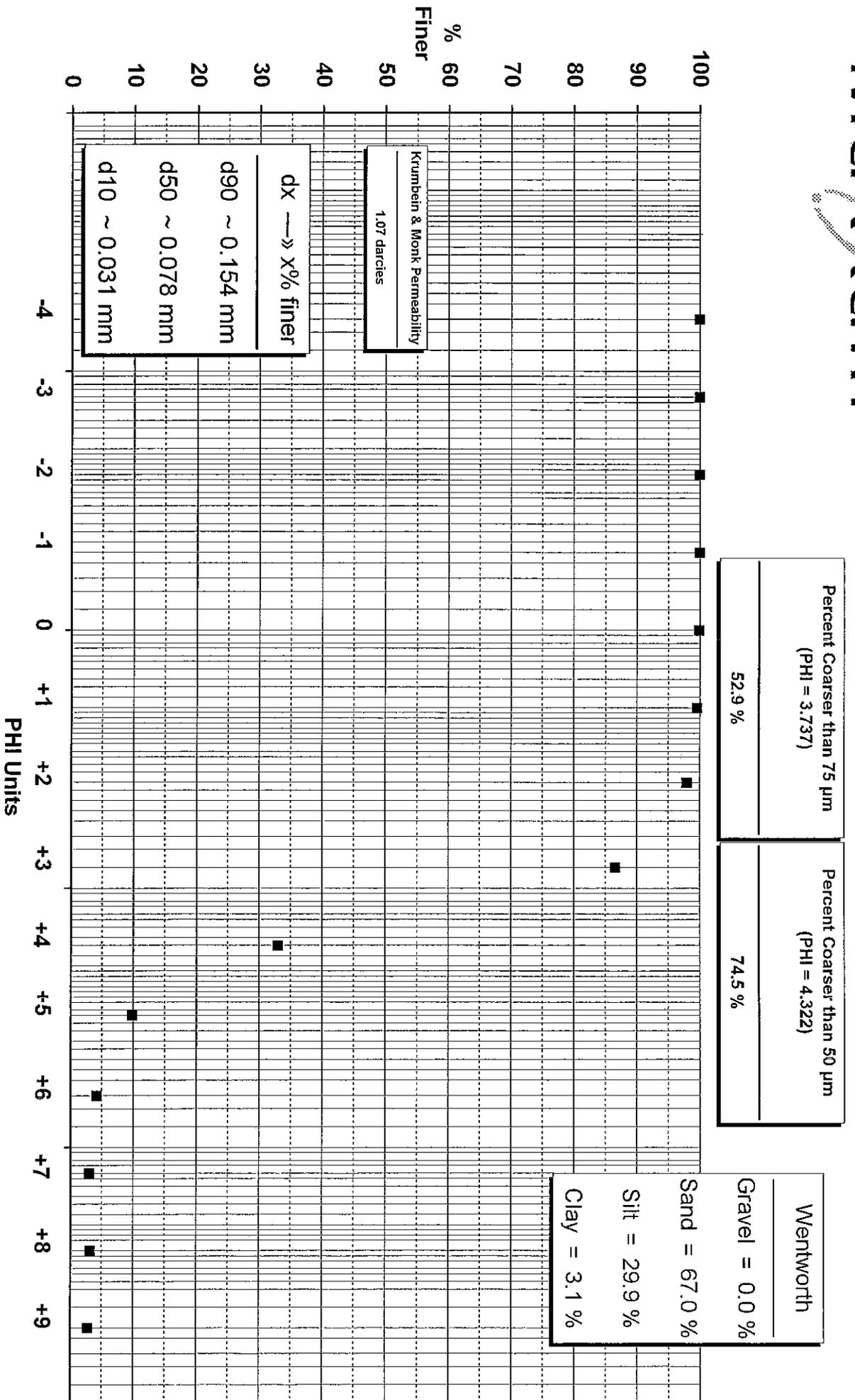
Wentworth
Gravel = 0.8 %
Sand = 71.6 %
Silt = 17.5 %
Clay = 10.0 %



ms
Approved

SS-P35

Maxxam ID: QJ8627-02



[Signature]
Approved

APPENDIX D

Limitations

This report was prepared for the exclusive use of Public Works and Government Services Canada, and is intended to provide Public Works and Government Services Canada with an assessment of the current environmental conditions at the Site. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third parties. Should additional parties require reliance on this report, written authorization from CBCL Limited will be required. No assurance is made regarding the accuracy and completeness of the data presented in this report. CBCL Limited disclaims responsibility for consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The report is based on data and information collected during the project conducted by CBCL Limited. It is based solely on the conditions on the site encountered at the time of the site visit, as described in this report. The assessment of environmental conditions at this Site has been made using the results of chemical analysis of discrete sediment samples from a limited number of locations. Additional studies, including further subsurface investigations, can reduce the inherent uncertainties associated with this type of study and problems inherent with interpretation of chemical composition between sample locations in areas of fill which are generally heterogeneous in nature. However, it is never possible, even with exhaustive sampling and testing, to dismiss the possibility that part of a site may be contaminated and remain undetected.

The services performed as described in this report were conducted in a manner consistent with the level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

This report provides a professional opinion and therefore no warranty is expressed, implied, or made as to the conclusions, advice, and recommendations offered in this report. This report does not provide a legal opinion regarding compliance with applicable laws. With respect to regulatory compliance issues, it should be noted that regulatory statutes and interpretation of regulatory statutes are subject to change.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work CBCL Limited should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.