

## APPENDIX A

### SOIL INVESTIGATION

March 11, 2013



**PUBLIC WORKS & GOVERNMENT SERVICES CANADA**

1045 Main Street, Unit 100  
Moncton, NB  
E1C 1H1

ATTENTION: Ms. Marcia Johannesen, B.Sc., M.A.Sc. (Env. Eng.)  
Environmental Officer

***Soil Investigation (FINAL)***  
***PWGSC Public Service Pension Centre Parking Lot***  
***Belliveau Street, Shediac, New Brunswick***  
***DFRP No. 22404***

The following report documents a soil investigation completed at the Public Works and Government Services Canada (PWGSC) Public Service Pension Centre (PSPC) Parking Lot located on Belliveau Street in Shediac, Westmorland County, New Brunswick.

**BACKGROUND**

The subject property is located on Belliveau Street in Shediac New Brunswick, and identified by PID Nos. 70276381 and 70217625. According to the Directory of Federal Real Property (DFRP) database and Service New Brunswick, the property is identified by DFRP No. 22404 and owned by PWGSC. The PWGSC PSPC building is located on PID No. 70276381, whereas the parking lot is located on the eastern portion of PID No. 70276381 and PID No. 70217625, as illustrated on Figure 1 and Figure 2.

In 1857, the subject property operated as part of the European and North American Railway, which transported passengers from Shediac to Moncton. According to historical aerial photographs obtained from the Department of Natural Resources (DNR), buildings were located in the location of the current PSPC building from 1944 until the early 1980s. Various equipment and/or mobile buildings were also present across the northern portion of the parking lot, whereas the rail lines were present in the middle of the parking lot. The rail lines remained on the property until the 1980's. The current building was constructed in 1982 with the original parking lot located on PID No. 70276381. By 2001, the parking lot was extended on PID No. 70217625.

The subject property is provided potable water and sewage services from the Town of Shediac, and is not located in a wellfield protection area under the New Brunswick Wellfield Protection Program or a designated watershed under the New Brunswick Watershed Protection Program. However it should be noted that the boundary of Zone C of the Protected Shediac Wellfield area, is located approximately 10 m north of the subject property. A copy of the New Brunswick Department of Environment and Local Government (NBDELG) Designated Wellfield Protected Area for the Town of Shediac is appended to this letter.

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## SCOPE OF WORK

At the request of PWGSC, Dillon completed a soil investigation in an effort to locate and characterize petroleum hydrocarbon impacts which were identified during a 2010 geotechnical investigation (Gemtec, 2010).

On November 16, 2012 and February 10, 2013, MEG Drilling Ltd. of Killam Mills, NB completed a drilling program under the supervision of Dillon personnel. The drilling program consisted of the advancement of twenty boreholes, six of which were completed in the general area of the historical borehole locations (Gemtec, 2010), and the remaining boreholes were strategically placed to assess conditions in support of a future parking lot rebuild. It should be noted that the placement of the boreholes during the November site visit was limited, due to the vehicle occupancy within the parking lot. Therefore, the supplemental drilling program was completed while the parking lot was vacant. Split-spoon samples, collected at 0.6 m intervals, were recovered from the boreholes until bedrock was encountered. Soil conditions were logged by Dillon field personnel at the time of sampling and are presented on the borehole logs presented in the Appendix.

Volatile organic compound (VOC) concentrations were obtained from the headspace of the recovered soil samples, at room temperature, using an Eagle Gastechtor 1238 with methane elimination and calibrated to hexane. Elevated soil vapour concentrations, typically above 200 ppm or in the % Lower Explosive Limit (LEL) range (10% LEL is equivalent to 1,000 ppm for gasoline), are generally indicative of the presence of volatile petroleum products (i.e. gasoline, and to a lesser extent diesel and fuel oil). The VOC measurement does not provide quantification of hydrocarbons in soil, but rather is an indication of the degree of contamination due to volatile hydrocarbon compounds relative to other samples. Based on visual observations during the field program and VOC readings, select soil samples were submitted for laboratory analysis. The headspace VOC readings and selected soil samples are illustrated on the appended borehole logs.

Soil samples were submitted to Maxxam Analytics in Bedford, Nova Scotia for metals, polycyclic aromatic hydrocarbons (PAHs) and petroleum hydrocarbon analysis as per the Canada-Wide-Standard (CWS) methodology. Maxxam is accredited by the Standards Council of Canada (SCC) for each of the methods utilized and has in-house QA/QC programs to govern sample analysis, including replicates. Laboratory analytical certificates are presented in the Appendix.

Based on field observations made during the soil investigations, soils generally consisted of sand and gravel fill with various debris, overlying a silty sand with sandstone rock fragments. Sandstone bedrock was encountered in the boreholes at depths ranging from 0.8 to 2.7 meters below ground surface (mbgs).



## RESULTS

The laboratory analytical results for metals, PAHs and petroleum hydrocarbons in soil were compared to the Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines (SoQGs) for the Protection of Environmental and Human Health (Update 7.0, September 2007), the CCME Canadian Soil Quality Guidelines (SQG) for the Protection of Environmental and Human Health: Polycyclic Aromatic Hydrocarbons (revised 2010), the CCME Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil (January 2008) and the 2012 Atlantic PIRI Tier I Risk-Based Screening Levels (RBSLs) and the Ecological Screening Levels (ESLs).

The laboratory analytical results for metals and PAHs in soil were below the CCME SoQGs and SQGs for a commercial site with coarse grained soil. Metals concentrations in soil are presented in Table 1. PAH concentrations in soil are presented in Table 2.

One soil sample collected from the north-eastern portion of the parking lot (BH12-16) exhibited a petroleum hydrocarbon concentration in the F2 range ( $C_{10}$ - $C_{16}$ ) exceeding the most stringent CCME CWS guideline (Eco Soil Contact). The areal extent of petroleum hydrocarbon impacts exceeding the CCME CWS guideline (Eco Soil Contact) is approximately 375 m<sup>2</sup>, as illustrated on Figure 1. However, soil samples collected during this assessment were collected from beneath the paved surface of the parking lot, and the sample exceeding the ecological soil contact was collected at a depth greater than 1.5 mbgs; therefore there is no potential for vascular plant growth and limited potential for invertebrate contact. Since there is limited potential for ecological contact beneath the parking lot, the applicable CCME CWS Management Limit guideline was applied.

The remaining soil samples exhibited petroleum hydrocarbon concentrations below the CCME SoQG, the CWS and the Atlantic PIRI Tier I RBSLs for a commercial site with non-potable groundwater use. Petroleum hydrocarbon concentrations in soil are presented in Table 3. A graphical representation of the petroleum hydrocarbon concentrations in soil is presented on Figure 1 and Figure 2.

## CONCLUSION

Petroleum hydrocarbon impacts were detected in nine of the twenty-four soil samples (including duplicates) collected from the borehole locations. Petroleum hydrocarbon concentrations exceeded the CCME CWS guideline (Eco Soil Contact) at only one location. The removal of soil with detectable concentrations (impacted soil) from the subject property must be handled accordingly, recognizing that guidelines are site-specific and more stringent guidelines may apply at other locations. Therefore, should impacted soil be removed from the subject property, it should be disposed at an approved soil disposal facility.

Metals, PAHs and petroleum hydrocarbon concentrations in soil were below the CCME SQGs, the CCME SoQGs, the CWS (Management Limit) and the 2012 Atlantic RBCA Tier I RBSLs for a commercial property with non-potable groundwater usage and coarse-grained soil.



Additionally, petroleum hydrocarbon concentrations in soil have been delineated to the potable criteria within the property boundary, as Zone C of the Shediac Protected Wellfield Area is located approximately 10 metres downgradient of the subject property boundary.

## CLOSURE

This report was prepared exclusively for the purposes, project, and site location(s) outlined in the report. The report is based on information provided to, or obtained by Dillon Consulting Limited ("Dillon") as indicated in the report, and applies solely to site conditions existing at the time of the site investigation(s). Although a reasonable investigation was conducted by Dillon, Dillon's investigation was by no means exhaustive and cannot be construed as a certification of the absence of any contaminants from the site(s).

This report was prepared by Dillon for the sole benefit of Public Works and Government Services Canada. The material in it reflects Dillon's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

If you have any questions or comments, please do not hesitate to contact me at your convenience.

Yours truly,

## DILLON CONSULTING LIMITED

Michelle DeGarie, P.Eng.  
Project Manager

Sean Hanlon, P.Eng.  
Senior Project Team Contact

Encl.    *Table 1 – Metal Concentrations in Soil*  
          *Table 2 – PAH Concentrations in Soil*  
          *Table 3 – Petroleum Hydrocarbon Concentrations in Soil*  
          *Figure 1 – Borehole Location Plan*  
          *Figure 2 – Soil Management Area*  
          *Figure A-1 - Aerial Photo (1944)*  
          *Figure A-2 - Aerial Photo (1953)*  
          *Figure A-3 - Aerial Photo (1963)*  
          *Figure A-4 - Aerial Photo (1976)*  
          *Figure A-5 - Aerial Photo (1982)*  
          *Figure A-6 - Aerial Photo (2001)*  
          *Figure A-7 - Aerial Photo (2011)*  
          *Schedule A.27 Wellfield Protected Areas – Shediac*  
          *Borehole Logs*  
          *Laboratory Analytical Certificates*

**Table 1: Metal Concentrations in Soil, Public Service Pension Centre Parking Lot, Shediac, NB**

Parameter	Units	CCME SoQG Residential/ Parkland	CCME SoQG Commercial	BH12-16 SA4	BH12-17 SA3	BH12-19 SA2
Aluminum	mg/kg	---	---	11000	8900	7800
Antimony	mg/kg	20	40	0.33	<0.2	<0.2
Arsenic	mg/kg	12	12	6.5	5.7	4.7
Barium	mg/kg	500	2000	120	60	33
Beryllium	mg/kg	4	8	0.84	0.6	0.54
Boron	mg/kg	---	---	0.058	0.066	<0.05
Cadmium	mg/kg	10	22	0.12	<0.1	<0.1
Calcium	mg/kg	---	---	1800	1100	550
Chromium	mg/kg	64	87	18	16	12
Chromium (IV)	mg/kg	0.4	1.4	<0.2	<0.2	<0.2
Cobalt	mg/kg	50	300	11	10	6.8
Copper	mg/kg	63	91	18	11	9.3
Iron	mg/kg	---	---	25000	19000	17000
Lead	mg/kg	140	260	12	9.7	8.6
Magnesium	mg/kg	---	---	5400	4600	3700
Manganese	mg/kg	---	---	620	1100	560
Molybdenum	mg/kg	10	40	<0.5	<0.5	<0.5
Nickel	mg/kg	50	50	22	18	14
Phosphorus	mg/kg	---	---	440	290	310
Potassium	mg/kg	---	---	770	470	410
Selenium	mg/kg	1	2.9	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	<0.2	<0.2	<0.2
Sodium	mg/kg	---	---	210	400	490
Strontium	mg/kg	---	---	6.6	5.8	3.7
Sulfur	mg/kg	---	---	<50	<50	<50
Thallium	mg/kg	1	1	0.29	0.06	<0.05
Vanadium	mg/kg	130	130	26	22	20
Zinc	mg/kg	200	360	57	42	34
Sample Depth (m)				1.8-2.4	1.2-1.8	0.6-1.2
Sample Date				16-Nov-12	16-Nov-12	16-Nov-12

**Notes:**

**BOLD result exceeds the applicable guideline.**

NA = Not Analyzed

FD = Field Duplicate

LD = Laboratory Duplicate

**Table 2: PAH concentrations in Soil, Public Service Pension Centre Parking Lot, Shediac, NB**

Parameter	CCME PAH Soil Guidelines <sup>1</sup>			Sample Concentrations (mg/kg)			
	CCME SoQG <sup>HH</sup>	CCME SoQGE <sup>3</sup>		BH12-15 SA4 1.8-2.4 m Nov 16, 2012	BH12-16 SA4 1.8-2.4 m Nov 16, 2012	BH12-17 SA4 1.8-2.4 m Nov 16, 2012	BH12-19 SA3 1.2-1.7 m Nov 16, 2012
	CCME SQGDC <sup>2</sup> (mg/kg)	SoQGSC Com/Ind (mg/kg)	ISoQC <sup>5</sup> Com/Ind (mg/kg)				
Acenaphthene *	-	-	-	< 0.005	0.037	< 0.005	< 0.005
Acenaphthylene *	-	-	-	< 0.005	0.0086	< 0.005	< 0.005
Anthracene *	-	32	-	< 0.005	< 0.005	< 0.005	< 0.005
Benzo(a)anthracene *	-	-	10	< 0.005	< 0.005	< 0.005	< 0.005
Benzo(a)pyrene *	-	72	1.4 6	< 0.005	< 0.005	< 0.005	< 0.005
Benzo(e)pyrene	-	-	-	< 0.005	< 0.005	< 0.005	< 0.005
Benzo(b)fluoranthene *	-	-	10	< 0.005	< 0.005	< 0.005	< 0.005
Benzo(g,h,i)perylene *	-	-	-	< 0.005	< 0.005	< 0.005	< 0.005
Benzo(k)fluoranthene *	-	-	10	< 0.005	< 0.005	< 0.005	< 0.005
Chrysene *	-	-	-	< 0.005	< 0.005	< 0.005	< 0.005
Dibenz(a,h)anthracene *	-	-	10	< 0.005	< 0.005	< 0.005	< 0.005
Fluoranthene *	-	180	-	< 0.005	< 0.005	< 0.005	< 0.005
Fluorene *	-	-	-	< 0.005	0.052	< 0.005	< 0.005
Indeno(1,2,3-cd)pyrene *	-	-	10	< 0.005	< 0.005	< 0.005	< 0.005
Naphthalene *	-	-	22 6	< 0.005	0.67	< 0.005	< 0.005
Phenanthrene *	-	-	50	< 0.005	0.026	< 0.005	< 0.005
Pyrene *	-	-	100	< 0.005	< 0.005	< 0.005	< 0.005
Total PAH (calculated)	-	-	-	0.04	0.78	0.04	0.04
Creosote or Coal Tar source suspected/known?				Yes	Yes	Yes	Yes
Uncertainty Factor Applied				3	3	3	3
B(a)P TPE4	<b>5.3</b>	-	-	0.02	0.02	0.02	0.02

**Notes:**

**Bold values indicate CCME exceedances.**

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

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

2 SoQGDC Soil Quality Guideline for human health based on CCME soil direct contact (ingestion, inhalation and dermal exposures) guidelines for the protection of human health based on a 10-5 incremental lifetime cancer risk (CCME, 2010)

3 SoQGE - Soil Quality Guideline for the protection of Environmental Health

4 When applicable half of the value of the detection limit was used to calculate B(a)P TPE.

5 ISoQC - Interim Soil Quality Criteria CCME 1991

6 Provisional SQGE CCME 1997

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

\*\* - sample re-evaluated in 2012 with BH12-11 SA4.

"-" denotes no guideline available.

Most current version of the guidelines accessed November 2012.

Table 3: Petroleum Hydrocarbon Concentrations in Soil, Public Service Pension Centre Parking Lot, Shediac, NB

Sample ID		Sample Date	Sample Depth (m bgs)	BTEX Concentrations (mg/kg)				Petroleum Hydrocarbon Concentrations (mg/kg)			
				Benzene	Toluene	Ethylbenzene	Xylenes	F1	F2	F3	F4G
BH12-12	SA2	16-Nov-12	0.6-1.2	<0.005	<0.02	<0.01	<0.04	<10	<10	31	290
	SA2 (L/D)	16-Nov-12	0.6-1.2	0.006	0.02	<0.01	<0.04	<10	<10	---	2000
BH12-13	SA2	16-Nov-12	0.6-1.2	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
BH12-14	SA2	16-Nov-12	0.6-1.2	<0.005	<0.02	<0.01	<0.04	<10	13	100	450
BH12-15	SA4	16-Nov-12	1.8-2.4	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
	SA4 (L/D)	16-Nov-12	1.8-2.4	<0.005	<0.02	<0.01	<0.04	<10	---	---	---
BH12-16	SA4	16-Nov-12	1.8-2.4	0.029	<0.2	0.47	0.66	280	<b>1000</b>	130	450
	SA4 (L/D)	16-Nov-12	1.8-2.4	0.028	<0.2	0.44	0.56	260	---	---	---
BH12-17	SA4	16-Nov-12	1.8-2.4	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
BH12-19	SA3	16-Nov-12	1.2-1.7	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
BH12-20	SA2	16-Nov-12	0.6-1.2	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
BH12-21	SA1	16-Nov-12	0.1-0.6	0.007	<0.02	<0.01	<0.04	<10	<10	<10	310
BH12-22	SA2	16-Nov-12	0.6-1.2	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
	SA2	10-Feb-13	0.6-1.2	0.009	0.04	<0.01	<0.04	<10	<10	<10	---
BH13-23	SA2 (L/D)	10-Feb-13	0.6-1.2	0.005	0.02	<0.01	<0.04	<10	<10	<10	---
	SA2	10-Feb-13	0.6-1.2	0.008	0.03	<0.01	<0.04	<10	<10	<10	---
BH13-24	SA2	10-Feb-13	0.6-1.2	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
BH13-25	SA2	10-Feb-13	0.6-1.2	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
BH13-26	SA2	10-Feb-13	0.6-1.2	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
BH13-27	SA2	10-Feb-13	0.6-0.9	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
BH13-28	SA2	10-Feb-13	0.6-1.2	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
	SA2 (F/D)	10-Feb-13	0.6-1.2	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
BH13-29	SA1	10-Feb-13	0.1-0.6	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
	SA1	10-Feb-13	0.1-0.6	0.23	0.7	0.05	0.67	<10	<10	39	21
BH13-30	SA2	10-Feb-13	0.6-1.2	<0.005	<0.02	<0.01	<0.04	<10	<10	<10	---
<b>FEDERAL</b>											
CCME SoQG <sup>1</sup> - Commercial Receptor with coarse-grained soil (Inhalation of indoor air/slab)				0.3	1,400	630	160	---	---	---	---
CCME CWS <sup>2</sup> for a Commercial non-potable site with coarse grained soil (Eco Soil Contact - Most conservative)				---	---	---	---	320 <sup>3</sup>	260	1700	3300
CCME CWS <sup>2</sup> for a Commercial non-potable site with coarse grained soil (Management Limit)				---	---	---	---	700	1000	3500	10000
<b>PROVINCIAL</b>											
2012 ATLANTIC PIRI TIER I RBSLs (Commercial Receptor, Non-Potable Groundwater Use, Coarse-Grained Soil)				2.5	10,000	10,000	110			Gasoline Fuel Oil Lube Oil	870 4,000 10,000
2012 ATLANTIC PIRI TIER I ESLs (Commercial Receptor and Coarse-Grained Soil: Plant and Soil Invertebrate Direct Soil Contact for soil located from 0-1.5 mbgs)				180	250	300	350	320	260	1700	3300

**Notes:**

1. Denotes the Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (Update 7.0, September 2007)
2. Denotes the CCME Canada-Wide Standards (CWS) for Petroleum Hydrocarbons in Soil (January 2008) and Technical Supplement (January 2008)
3. Since the site is located outside of Zone C of the Shediac Protected Wellfield Area, the "Protection of Potable Groundwater" was deemed inapplicable.

**BOLD result exceeds the applicable guideline.**

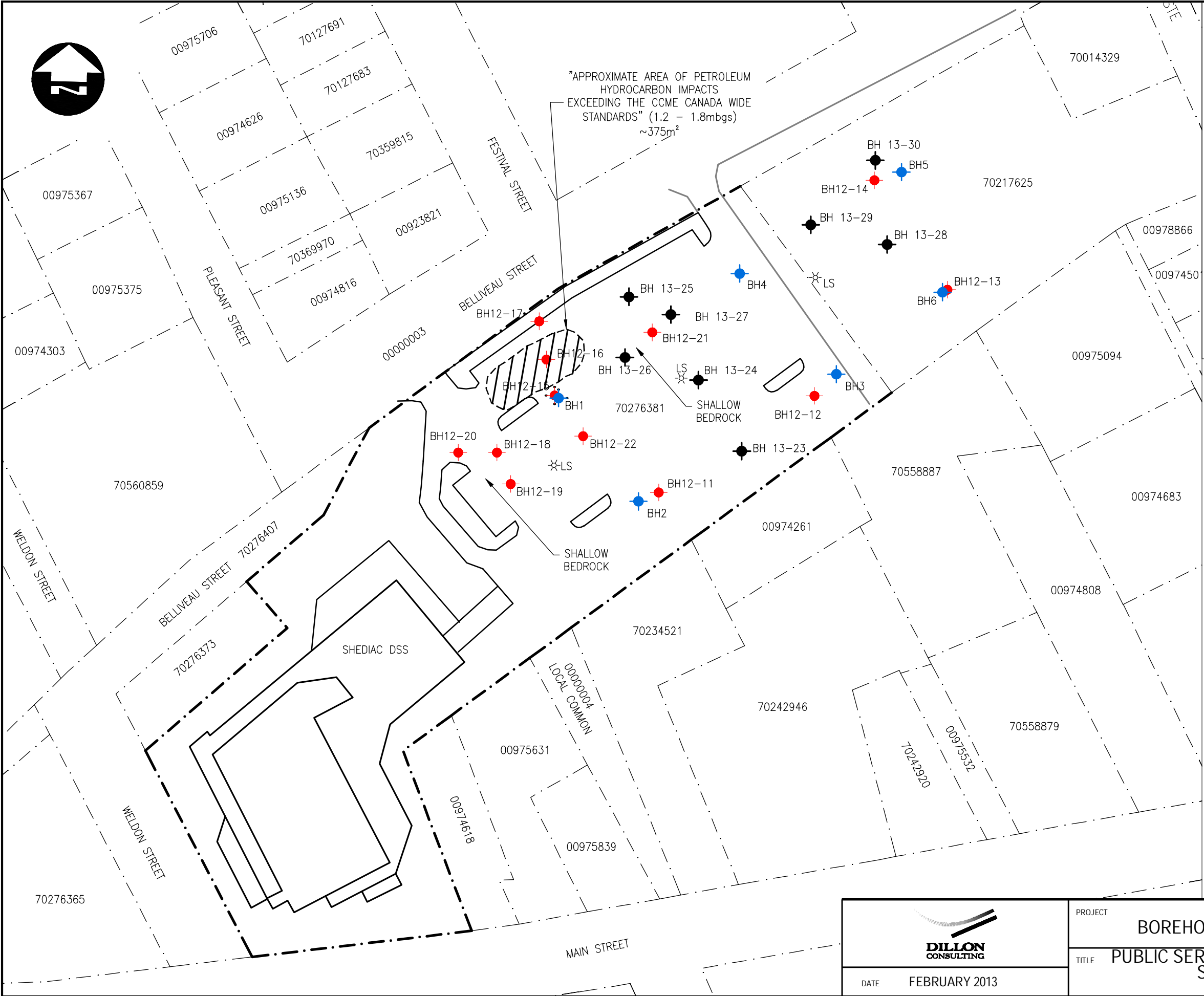
LD = Laboratory Duplicate

--- = Not Analyzed





G:\CAD\127092\127092-05-03- FIG 1.dwg



**NEW BRUNSWICK KEY MAP**

LEGEND

- SUBJECT PROPERTY
- PROPERTY BOUNDARY
- EXISTING STRUCTURE ABOVEGROUND
- FORMER STRUCTURE ABOVEGROUND
- EXISTING STRUCTURE UNDERGROUND
- FORMER STRUCTURE UNDERGROUND
- BOREHOLE LOCATION (DILLON, 2013)
- BOREHOLE LOCATION (DILLON, 2012)
- BOREHOLE LOCATION (GEMTEC, 2010)
- LS LIGHT STANDARD
- 70276381 PID NUMBER
- APPROXIMATE AREA PETROLEUM HYDROCARBON IMPACTS EXCEEDING THE CCME STANDARDS

NOTE: FIGURE REFERENCES GEMTEC CONSULTING ENGINEERS, FIGURE 1, DATED DECEMBER 2010

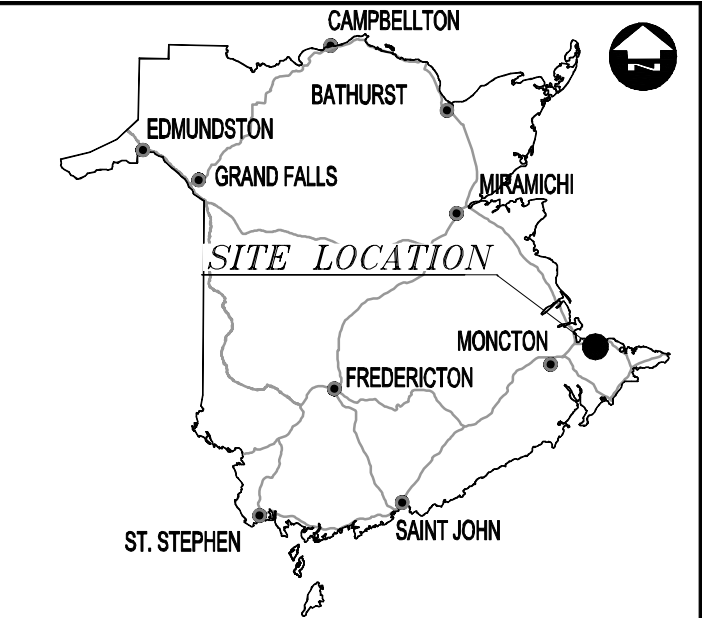
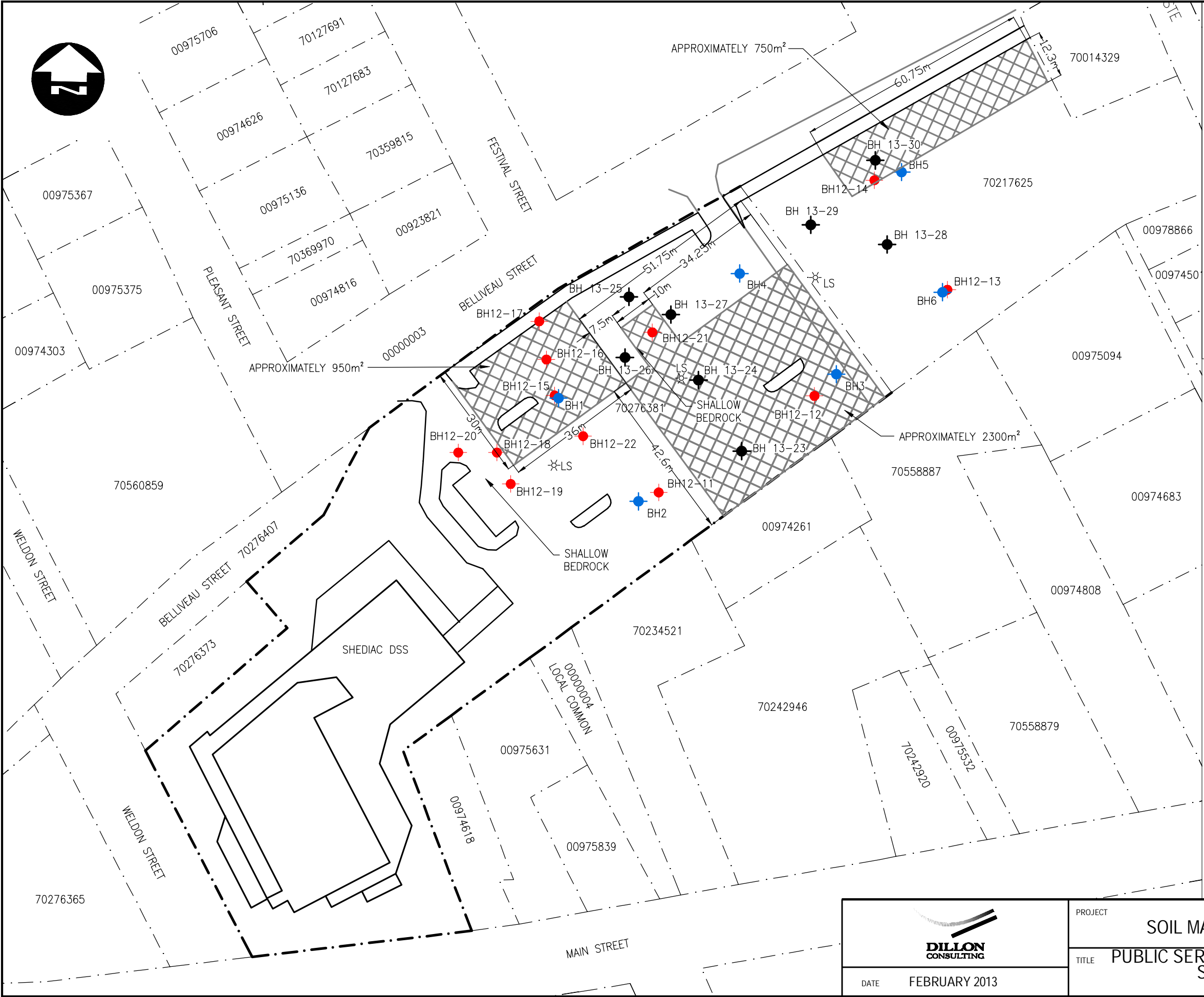
0 10 20 30 40 50m

SCALE 1:1000

 <b>DILLON</b> CONSULTING	PROJECT	BOREHOLE LOCATION PLAN	PROJECT NO.	12-7092
	TITLE	PUBLIC SERVICE PENSION CENTRE SHEDIAC, NB PWGSC		FIGURE NO.
DATE	FEBRUARY 2013			



G:\CAD\127092\127092-05-03- FIG 1.dwg

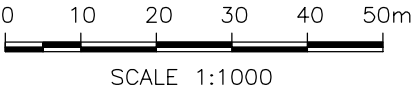


NEW BRUNSWICK KEY MAP

LEGEND

- SUBJECT PROPERTY
- - - - - PROPERTY BOUNDARY
- EXISTING STRUCTURE ABOVEGROUND
- FORMER STRUCTURE ABOVEGROUND
- EXISTING STRUCTURE UNDERGROUND
- FORMER STRUCTURE UNDERGROUND
- BOREHOLE LOCATION (DILLON, 2013)
- BOREHOLE LOCATION (DILLON, 2012)
- BOREHOLE LOCATION (GEMTEC, 2010)
- ✕LS LIGHT STANDARD
- 70276381 PID NUMBER
- DETECTABLE PETROLEUM HYDROCARBONS PRESENT IN THE TOP 1.2m OF SOIL. IF THE SOIL FROM THESE AREAS IS REMOVED FROM THE SITE, IT MUST BE DISPOSED OF AT AN APPROVED DISPOSAL FACILITY.

NOTE: FIGURE REFERENCES GEMTEC CONSULTING ENGINEERS, FIGURE 1, DATED DECEMBER 2010



 DILLON CONSULTING	PROJECT SOIL MANAGEMENT AREA	PROJECT NO. 12-7092
	TITLE PUBLIC SERVICE PENSION CENTRE SHEDIAC, NB PWGSC	FIGURE NO. 2
DATE FEBRUARY 2013		







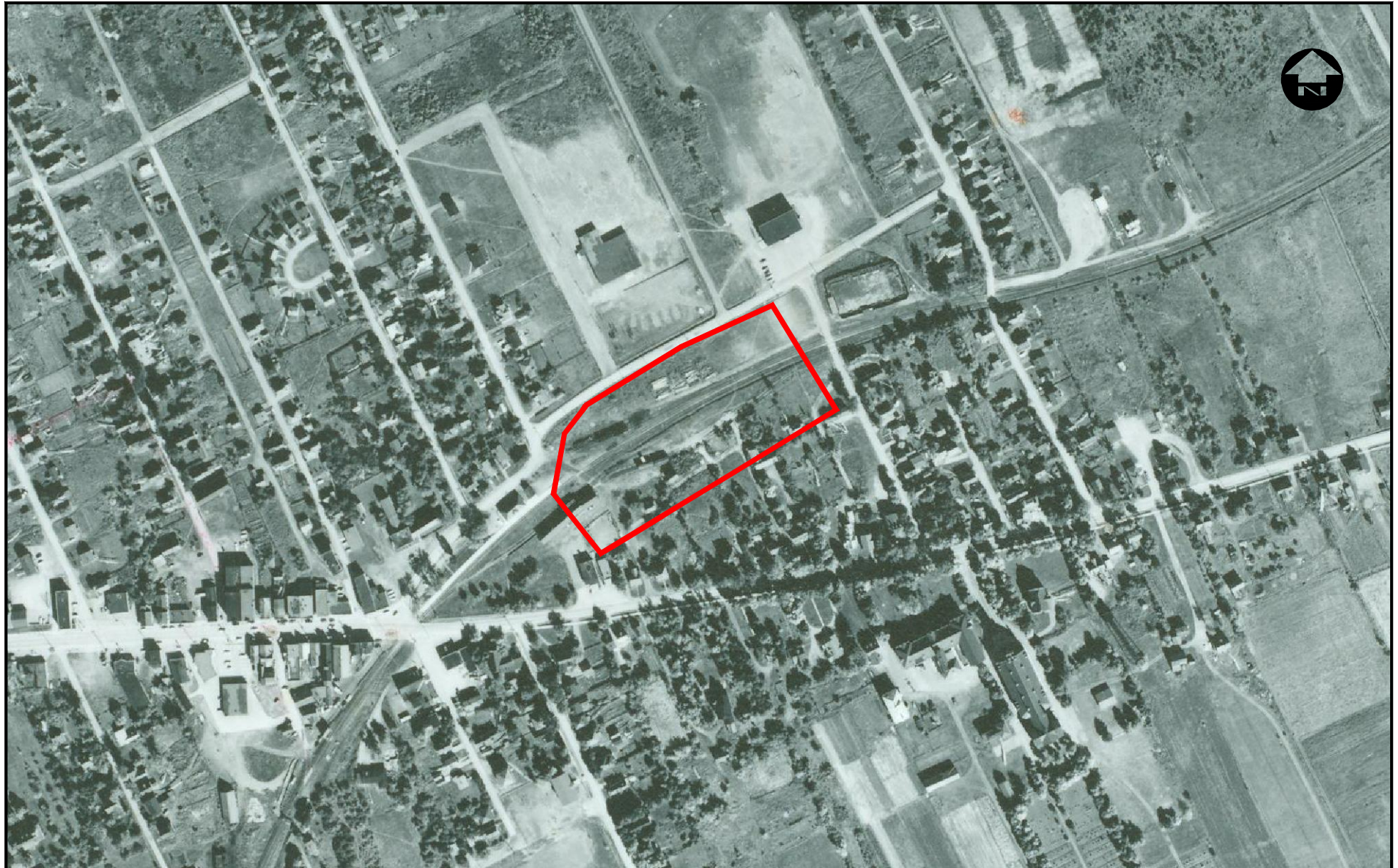
 <b>DILLON</b> CONSULTING	PROJECT	AERIAL PHOTO - 1944	PROJECT NO.	12-7092
	TITLE	PUBLIC SERVICE PENSION CENTRE SHEDIAC, NB PWGSC	FIGURE NO.	A-1
DATE	FEBRUARY 2013			





 <b>DILLON</b> CONSULTING	PROJECT AERIAL PHOTO - 1953	PROJECT NO. 12-7092
	TITLE PUBLIC SERVICE PENSION CENTRE SHEDIAC, NB PWGSC	FIGURE NO. A-2
DATE FEBRUARY 2013		





DATE

FEBRUARY 2013

PROJECT

AERIAL PHOTO - 1963

TITLE

PUBLIC SERVICE PENSION CENTRE  
SHEDIAC, NB  
PWGSC

PROJECT NO.

12-7092

FIGURE NO.

A-3





DATE FEBRUARY 2013

PROJECT

AERIAL PHOTO - 1976

PROJECT NO.

12-7092

TITLE

PUBLIC SERVICE PENSION CENTRE  
SHEDIAC, NB  
PWGSC

FIGURE NO.

A-4





DATE

FEBRUARY 2013

PROJECT

AERIAL PHOTO - 1982

TITLE

PUBLIC SERVICE PENSION CENTRE  
SHEDIAC, NB  
PWGSC

PROJECT NO.

12-7092

FIGURE NO.

A-5





DATE FEBRUARY 2013

PROJECT

AERIAL PHOTO - 2001

PROJECT NO.

12-7092

TITLE

PUBLIC SERVICE PENSION CENTRE  
SHEDIAC, NB  
PWGSC

FIGURE NO.

A-6





DATE FEBRUARY 2013

PROJECT

AERIAL PHOTO - 2011

TITLE

PUBLIC SERVICE PENSION CENTRE  
SHEDIAC, NB  
PWGSC

PROJECT NO.

12-7092

FIGURE NO.

A-7



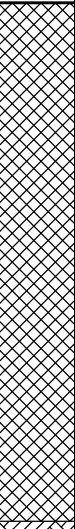





SCHEDULE A.27 ANNEXE A.27	
WELLFIELD PROTECTED AREAS - SHEDIAC SECTEURS PROTÉGÉS DU CHAMP DE CAPTAGE - SHEDIAC	
Shediac, N.B. Shediac (N.-B.)	
<b>Legend</b>	<b>Symbol / Symbole</b>
<b>Boundary of a Zone A</b>	..... Limites d'une zone A
<b>Boundary of a Zone B</b> (Zone B does not include any Zone A)	----- Limites d'une zone B (Une zone B n'inclut aucune zone A)
<b>Boundary of a Zone C</b> (Zone C does not include any Zone A or Zone B)	_____ Limites d'une zone C (Une zone C n'inclut aucune zone A ou zone B)
<b>Municipal Boundary</b>	----- Limite de la municipalité
<b>Well head</b>	⬠ Tête de puits
MAP: W1_20	Department of Environment Ministère de l'Environnement
SCALE: 1 / 4 000	<b>New Brunswick</b>
DATE: 2005 / 11 / 25	

<b>NOTES:</b>	
1 The property lines shown on this plan were transferred from Service New Brunswick property maps. The property lines are shown on this plan to aid in the identification of individual properties within the wellfield protected areas. Please refer to the actual Service New Brunswick property maps for complete property and ownership information.	
2 A copy of the <i>Wellfield Protected Area Designation Order</i> that designates the wellfield(s) shown on this plan as protected areas (a) is filed in the head office of the Department of Environment, and in the regional office of the Department of Environment situated most closely to the protected areas, and (b) is registered in the registry office or registry offices of Service New Brunswick for the county or counties in which the protected areas are situated.	
<b>NOTES :</b>	
1 Les limites de propriétés figurant sur le présent plan ont été décalquées des cartes foncières de Services Nouveau-Brunswick. Elles y figurent pour faciliter l'identification des propriétés particulières se trouvant à l'intérieur des secteurs protégés du champ de captage. Veuillez vous reporter aux véritables cartes foncières de Services Nouveau-Brunswick pour obtenir des renseignements complets à l'égard des propriétés et des propriétaires.	
2 Un exemplaire du <i>Décret de désignation du secteur protégé des champs de captage</i> qui désigne le(s) champ(s) de captage figurant sur ce plan comme secteurs protégés (a) est déposé au bureau principal du ministère de l'Environnement, et au bureau régional du ministère de l'Environnement qui est le plus rapproché des secteurs protégés, et (b) est enregistré au bureau de l'enregistrement ou aux bureaux de l'enregistrement de Services Nouveau-Brunswick du comté ou des comtés où sont situés les secteurs protégés.	



Client: <u>PWGSC</u>	Project: <u>Superannuation Parking Lot</u>
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Drilling Co.: <u>MEG Drilling Ltd.</u>	Drilling Method: <u>Standard Augers</u>
Supervised by: <u>V. Graves</u>	Date Started: <u>16/11/12</u> Date Completed: <u>16/11/12</u>

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Surface Elevation = m							
	FILL Brown Silty Sand and Gravel Fill. Trace coal fragments throughout.  No hydrocarbon odors noted.					SA1	---	
1.0						SA2	0	1.0
	BEDROCK End of Borehole		1.1 1.1					

DILLON BH - MAD BH LOGS.GPJ DILLON\_MAY13\_05.GDT 11/12/12

**LITHOLOGY  
SYMBOLS**



Fill (made ground)



Bedrock

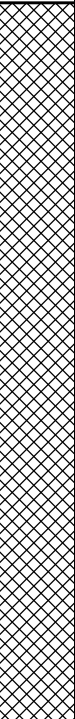




**SAMPLE  
TYPE**



Split Spoon


\* Indicates sample submitted for analysis \*\* Indicated sample submitted for duplicate analysis

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Project No.: 12-7092-1000 Location: Belliveau Avenue, Shediac, NB  
Drilling Co.: MEG Drilling Ltd. Drilling Method: Standard Augers  
Supervised by: V. Graves Date Started: 16/11/12 Date Completed: 16/11/12

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Surface Elevation = m							
	FILL Brown and Grey Silty Sand and Gravel Fill. Glass fragments at 0.6 mbgs.  No hydrocarbon odors noted.					SA1	0	
1.0						SA2	0	1.0
	Coal fragments present from 1.4 to 1.5 mbgs.					SA2	---	
	BEDROCK		1.5					
	End of Borehole		1.6					

DILLON BH - MAD BH LOGS.GPJ DILLON\_MAY13\_05.GDT 11/12/12

**LITHOLOGY  
SYMBOLS**

 Fill (made ground)

 Bedrock






**SAMPLE  
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Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Surface Elevation = m							
	FILL Light-Brown, Reddish-Brown and Grey Silty Sand and Gravel Fill. Trace sandstone fragments throughout.					SA1	---	
1.0	No hydrocarbon odors noted.					SA2	0	1.0
						SA3	0	
2.0						SA4	0	2.0
	Trace coal fragments present at 2.4 mbgs.					SA5	---	
	BEDROCK		2.6					
	End of Borehole		2.7					

DILLON BH - MAD BH LOGS.GPJ DILLON\_MAY13\_05.GDT 11/12/12

**LITHOLOGY SYMBOLS**



Fill (made ground)



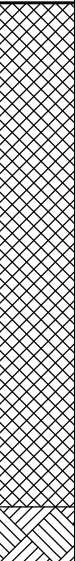



Bedrock

**SAMPLE TYPE**



Split Spoon

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Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Surface Elevation = m							
	FILL Brown Silty Sand and Gravel Fill. Trace sandstone fragments throughout.  No hydrocarbon odors noted.					SA1	---	
1.0						SA2	0	1.0
	BEDROCK		1.1					
	End of Borehole		1.2					

DILLON BH - MAD BH LOGS.GPJ DILLON\_MAY13\_05.GDT 11/12/12

LITHOLOGY  
SYMBOLS



Fill (made ground)



Bedrock

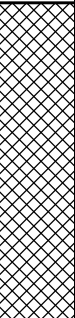

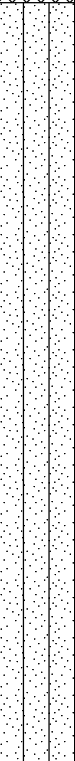




SAMPLE  
TYPE



Split Spoon



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Project No.: 12-7092-1000 Location: Belliveau Avenue, Shediac, NB  
Drilling Co.: MEG Drilling Ltd. Drilling Method: Standard Augers  
Supervised by: V. Graves Date Started: 16/11/12 Date Completed: 16/11/12

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Surface Elevation = m							
	FILL Brown Silty Sand and Gravel Fill.					SA1	---	
1.0	SILTY SAND Reddish-Brown Silty Sand with trace coal fragments, becoming grey with depth.		0.7			SA2	0	1.0
						SA3	0	
2.0	Petroleum hydrocarbon odors noted from 2.13 to 2.3 mbgs.					SA4*	---	2.0
	BEDROCK		2.3					
	End of Borehole		2.4					


DILLON BH - MAD BH LOGS.GPJ DILLON\_MAY13\_05.GDT 11/12/12

**LITHOLOGY  
SYMBOLS**

 Fill (made ground)  
 Bedrock

 Silty Sand



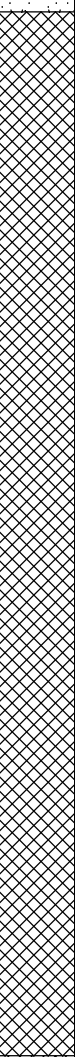





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Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Surface Elevation = m							
	TOPSOIL							
	FILL Brown Silty Sand and Gravel Fill, becoming grey at depth.		0.2			SA1	0	
1.0						SA2	---	1.0
						SA3*	0	
2.0	Petroleum hydrocarbon odor noted at 2.28 mbgs.					SA4*	15	2.0
	BEDROCK		2.4					
	End of Borehole		2.4					


DILLON BH - MAD BH LOGS.GPJ DILLON\_MAY13\_05.GDT 11/12/12

**LITHOLOGY SYMBOLS**

 Organics  
 Bedrock

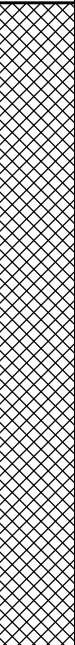




 Fill (made ground)

**SAMPLE TYPE**

 Split Spoon


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Supervised by: V. Graves Date Started: 16/11/12 Date Completed: 16/11/12

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Surface Elevation = m							
	FILL Brown Silty Sand and Gravel Fill with increasing sandstone fragments.					SA1	0	
	No hydrocarbon odors noted.					SA2	---	
1.0						SA3	---	1.0
	BEDROCK		1.4					
	End of Borehole		1.5					

DILLON BH - MAD BH LOGS.GPJ DILLON\_MAY13\_05.GDT 11/12/12

LITHOLOGY  
SYMBOLS

 Fill (made ground)

 Bedrock

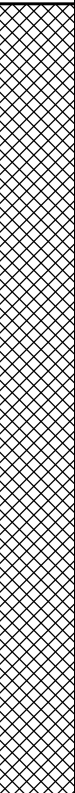




SAMPLE  
TYPE

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Drilling Co.: <u>MEG Drilling Ltd.</u>			Drilling Method: <u>Standard Augers</u>		
Supervised by: <u>V. Graves</u>			Date Started: <u>16/11/12</u> Date Completed: <u>16/11/12</u>		

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Surface Elevation = m							
1.0	<b>FILL</b> Brown Silty Sand and Gravel Fill. Trace coal fragments from 0.9 mbgs.  No hydrocarbon odors noted.					SA1	---	1.0
						SA2*	0	
						SA3*	0	
	<b>BEDROCK</b>		1.7					
	End of Borehole		1.8					

DILLON BH - MAD BH LOGS.GPJ DILLON\_MAY13\_05.GDT 11/12/12

LITHOLOGY  
SYMBOLS



Fill (made ground)



Bedrock




SAMPLE  
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Supervised by: V. Graves Date Started: 16/11/12 Date Completed: 16/11/12

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Surface Elevation = m							
	FILL Brown Silty Sand Fill.  No hydrocarbon odors noted.					SA1	0	
1.0						SA2*	---	1.0
	BEDROCK		1.1					
	End of Borehole		1.2					

DILLON BH - MAD BH LOGS.GPJ DILLON\_MAY13\_05.GDT 11/12/12

LITHOLOGY  
SYMBOLS



Fill (made ground)



Bedrock

SAMPLE  
TYPE

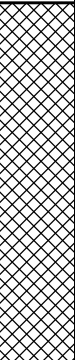





Split Spoon

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Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Surface Elevation = m							
	FILL Brown Sand and Gravel Fill.  No hydrocarbon odors noted.					SA1	0	
						SA2	---	
	BEDROCK End of Borehole		0.8 0.8					

DILLON BH - MAD BH LOGS.GPJ DILLON\_MAY13\_05.GDT 11/12/12

**LITHOLOGY  
SYMBOLS**

 Fill (made ground)

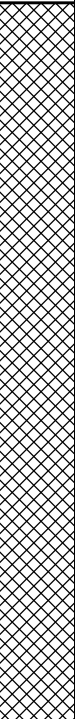




 Bedrock

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Supervised by: V. Graves Date Started: 16/11/12 Date Completed: 16/11/12

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Surface Elevation = m							
	FILL Light Brown Sand and Gravel Fill.  No hydrocarbon odors noted.					SA1	---	
1.0						SA2*	0	1.0
						SA3	0	
	BEDROCK		1.5					
	End of Borehole		1.6					


DILLON BH - MAD BH LOGS.GPJ DILLON\_MAY13\_05.GDT 11/12/12

LITHOLOGY  
SYMBOLS

 Fill (made ground)



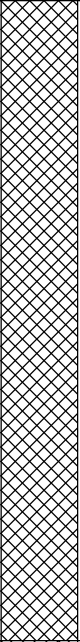
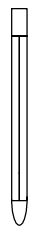
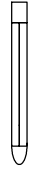

 Bedrock

SAMPLE  
TYPE

 Split Spoon

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Project No.: <u>12-7092-1000</u>	Location: <u>See site plan</u>
Drilling Co.: <u>MEG Drilling Ltd.</u>	Drilling Method: <u>Standard Auger / Split Spoon</u>
Supervised by: <u>J. Shee</u>	Date Started: <u>2/10/13</u> Date Completed: <u>2/10/13</u>

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC (ppm or %LEL)	
	Asphalt							
	FILL Sand and gravel fill.		0.1			SA1	0	
1.0						*SA2	0	1.0
						SA3	0	
	BEDROCK Grey sandstone.		1.5					
	End of Borehole		1.7					

DILLON BH - NO ELEVATION SHEDJAC 12-7092.GPJ DILLON\_MAY13\_05.GDT 2/19/13

**LITHOLOGY SYMBOLS**


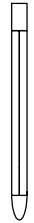
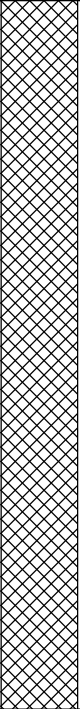
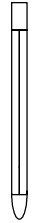
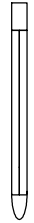




**SAMPLE TYPE**



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Project No.: <u>12-7092-1000</u>	Location: <u>See site plan</u>
Drilling Co.: <u>MEG Drilling Ltd.</u>	Drilling Method: <u>Standard Auger / Split Spoon</u>
Supervised by: <u>J. Shee</u>	Date Started: <u>2/10/13</u> Date Completed: <u>2/10/13</u>

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC (ppm or %LEL)	
	Asphalt							
	FILL Sand and gravel fill.		0.1			SA1	0	
1.0						*SA2	0	1.0
						SA3	0	
	BEDROCK Grey sandstone.		1.7					
	End of Borehole		1.8					

DILLON BH - NO ELEVATION SHEDJAC 12-7092.GPJ DILLON\_MAY13\_05.GDT 2/19/13

**LITHOLOGY  
SYMBOLS**




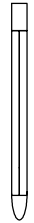
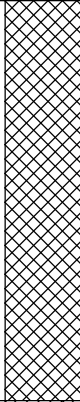
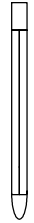
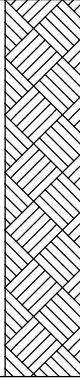
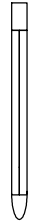
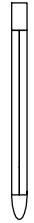
 Fill (made ground)

**SAMPLE  
TYPE**

 Split Spoon

\* Indicates sample submitted for analysis \*\* Indicated sample submitted for duplicate analysis


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Project No.: 12-7092-1000 Location: See site plan  
Drilling Co.: MEG Drilling Ltd. Drilling Method: Standard Auger / Split Spoon  
Supervised by: J. Shee Date Started: 2/10/13 Date Completed: 2/10/13

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC (ppm or %LEL)	
	Asphalt							
	FILL Brown sand and gravel fill.		0.1			SA1	0	
1.0	BEDROCK Fractured grey sandstone.		1.0			*SA2	0	1.0
						SA3	0	
	End of Borehole		1.8					

DILLON BH - NO ELEVATION SHEDJAC 12-7092.GPJ DILLON\_MAY13\_05.GDT 2/19/13

**LITHOLOGY  
SYMBOLS**



 Fill (made ground)



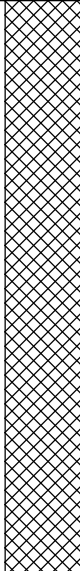

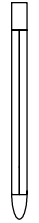

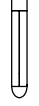
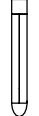
**SAMPLE  
TYPE**



Split Spoon

\* Indicates sample submitted for analysis \*\* Indicated sample submitted for duplicate analysis


Client: PWGSC Project: Superannuation Parking Lot  
Project No.: 12-7092-1000 Location: See site plan  
Drilling Co.: MEG Drilling Ltd. Drilling Method: Standard Auger / Split Spoon  
Supervised by: J.Shee Date Started: 2/10/13 Date Completed: 2/10/13

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Asphalt							
	FILL Brown sand and gravel fill.		0.1			SA1	0	
1.0						*SA2	0	1.0
	BEDROCK Fractured grey sandstone.		1.4			SA3	0	
						SA4	0	
	End of Borehole		1.8					



DILLON BH - NO ELEVATION SHEDJAC 12-7092.GPJ DILLON\_MAY13\_05.GDT 2/19/13

**LITHOLOGY SYMBOLS**

 Asphalt  
 Bedrock



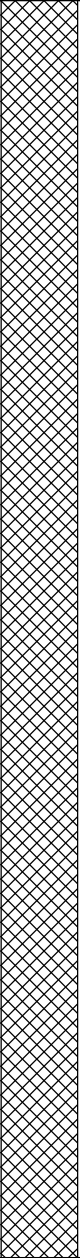



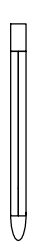
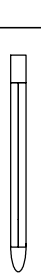
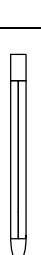

 Fill (made ground)

**SAMPLE TYPE**

 Auger  
 Split Spoon

\* Indicates sample submitted for analysis \*\* Indicated sample submitted for duplicate analysis


Client: PWGSC Project: Superannuation Parking Lot  
Project No.: 12-7092-1000 Location: See site plan  
Drilling Co.: MEG Drilling Ltd. Drilling Method: Standard Auger / Split Spoon  
Supervised by: J. Shee Date Started: 2/10/13 Date Completed: 2/10/13

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC (ppm or %LEL)	
	Asphalt							
	FILL Dense brown sand and gravel fill.		0.1			SA1	0	
1.0						*SA2	0	
						-	-	1.0
						SA3	0	
2.0						SA4	0	2.0
						SA5	0	
3.0	Bedrock		2.9					
	End of Borehole		3.0					3.0



DILLON BH - NO ELEVATION SHEDJAC 12-7092.GPJ DILLON\_MAY13\_05.GDT 2/19/13

**LITHOLOGY  
SYMBOLS**

 Asphalt  
 Bedrock




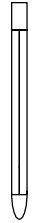
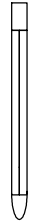

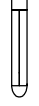
 Fill (made ground)

**SAMPLE  
TYPE**

 Auger  
 Split Spoon

\* Indicates sample submitted for analysis \*\* Indicated sample submitted for duplicate analysis



Client: PWGSC Project: Superannuation Parking Lot  
Project No.: 12-7092-1000 Location: See site plan  
Drilling Co.: MEG Drilling Ltd. Drilling Method: Standard Auger / Split Spoon  
Supervised by: J. Shee Date Started: 2/10/13 Date Completed: 2/10/13

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC(ppm or %LEL)	
	Asphalt							
	FILL Brown sand and gravel fill.		0.1			SA1	0	
1.0						*SA2	0	1.0
						SA3	0	
2.0	Bedrock		2.0			SA4	0	2.0
	End of Borehole		2.1					

**LITHOLOGY SYMBOLS**

 Asphalt  
 Fill (made ground)  
 Bedrock


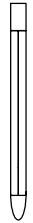
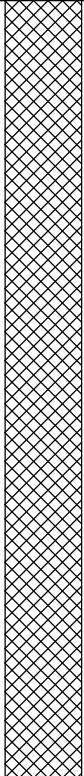
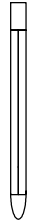

**SAMPLE TYPE**

 Auger  
 Split Spoon

\* Indicates sample submitted for analysis \*\* Indicated sample submitted for duplicate analysis




Client: PWGSC Project: Superannuation Parking Lot  
Project No.: 12-7092-1000 Location: See site plan  
Drilling Co.: MEG Drilling Ltd. Drilling Method: Standard Auger / Split Spoon  
Supervised by: J. Shee Date Started: 2/10/13 Date Completed: 2/10/13

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC (ppm or %LEL)	
	Asphalt							
	FILL Brown sand and gravel fill.		0.1			*SA1	0	
1.0						SA2	0	1.0
	Brown Sandstone fragments observed.					SA3	0	
	End of Borehole		1.8					


DILLON BH - NO ELEVATION SHEDJAC 12-7092.GPJ DILLON\_MAY13\_05.GDT 2/19/13

LITHOLOGY  
SYMBOLS

 Asphalt

 Fill (made ground)



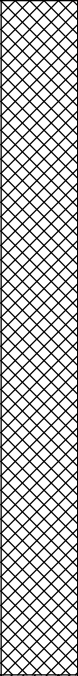

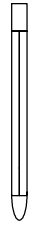
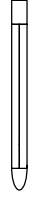
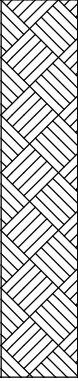

SAMPLE  
TYPE

 Split Spoon

 Auger

\* Indicates sample submitted for analysis \*\* Indicated sample submitted for duplicate analysis


Client: <u>PWGSC</u>	Project: <u>Superannuation Parking Lot</u>
Project No.: <u>12-7092-1000</u>	Location: <u>See site plan</u>
Drilling Co.: <u>MEG Drilling Ltd.</u>	Drilling Method: <u>Standard Auger / Split Spoon</u>
Supervised by: <u>J. Shee</u>	Date Started: <u>2/10/13</u> Date Completed: <u>2/10/13</u>

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Notes	Sample			Depth Scale (m)
					Method	Number	VOC (ppm or %LEL)	
	Asphalt							
	FILL Dark brown sand, silt and gravel fill.		0.1			*SA1	5	
1.0						*SA2	0	1.0
						SA3	0	
	BEDROCK Brown Sandstone.		1.6			SA4	0	2.0
2.0								
	End of Borehole		2.4					

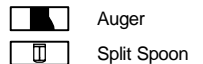
DILLON BH - NO ELEVATION SHEDJAC 12-7092.GPJ DILLON\_MAY13\_05.GDT 2/19/13

**LITHOLOGY  
SYMBOLS**



 Fill (made ground)

**SAMPLE  
TYPE**



\* Indicates sample submitted for analysis \*\* Indicated sample submitted for duplicate analysis

Your Project #: 12-7092-1000  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC  
Your C.O.C. #: 38091301, 380913-01-01, B092147

**Attention: Michelle Degarie**

Dillon Consulting Limited  
1149 Smythe St  
Fredericton, NB  
E3B 3H4

**Report Date: 2012/12/05**

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

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B2I1866**

**Received: 2012/11/20, 09:36**

Sample Matrix: Soil  
# Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Hot Water Extractable Boron (1)	3	2012/11/28	2012/11/28	CAM SOP-00408	R153 Ana. Prot. 2011
Hexavalent Chromium in Soil by IC (1,2)	1	2012/11/23	2012/11/27	CAM SOP-00436	EPA SW846-3060/7199
Hexavalent Chromium in Soil by IC (1,2)	2	2012/11/26	2012/11/28	CAM SOP-00436	EPA SW846-3060/7199
Petroleum Hydro. CCME F1 & BTEX in Soil (1)	5	2012/11/22	2012/11/27	CAM SOP-00315	CCME CWS
Petroleum Hydro. CCME F1 & BTEX in Soil (1)	1	2012/11/23	2012/11/27	CAM SOP-00315	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil (1)	3	2012/11/23	2012/11/24	CAM SOP-00316	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil (1)	1	2012/11/24	2012/11/27	CAM SOP-00316	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil (1)	2	2012/11/27	2012/11/28	CAM SOP-00316	CCME CWS
Total Metals Analysis by ICP (1)	3	2012/11/28	2012/11/28	CAM SOP-00408	SW-846 6010C
Acid Extr. Metals (aqua regia) by ICPMS (1)	1	2012/11/27	2012/11/28	CAM SOP-00447	EPA 6020
Acid Extr. Metals (aqua regia) by ICPMS (1)	2	2012/11/27	2012/11/29	CAM SOP-00447	EPA 6020
Moisture (1)	2	N/A	2012/11/23	CAM SOP-00445	R.Carter,1993
Moisture (1)	4	N/A	2012/11/24	CAM SOP-00445	R.Carter,1993
Moisture (1)	2	N/A	2012/11/26	CAM SOP-00445	R.Carter,1993
PAH Compounds in Soil by GC/MS (SIM) (1)	4	2012/11/24	2012/11/24	CAM SOP - 00318	EPA 8270

**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.

Your Project #: 12-7092-1000  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC  
Your C.O.C. #: 38091301, 380913-01-01, B092147

**Attention: Michelle Degarie**

Dillon Consulting Limited  
1149 Smythe St  
Fredericton, NB  
E3B 3H4

**Report Date: 2012/12/05**

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

**CERTIFICATE OF ANALYSIS**

-2-

Encryption Key

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

Keri Mackay, Project Manager - Bedford  
Email: [kmackay@maxxam.ca](mailto: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: 2

Maxxam Job #: B2I1866  
Report Date: 2012/12/05

Dillon Consulting Limited  
Client Project #: 12-7092-1000  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC  
Sampler Initials: VG

### RESULTS OF ANALYSES OF SOIL

Maxxam ID		PR0322		PR0323		PR0324		PR0325		
Sampling Date		2012/11/15		2012/11/15		2012/11/15		2012/11/15		
COC Number		380913-01-01		380913-01-01		380913-01-01		380913-01-01		
	Units	BH12-16 SA4	QC Batch	BH12-17 SA4	QC Batch	BH12-17 SA3	QC Batch	BH12-19 SA3	RDL	QC Batch

<b>Inorganics</b>										
Chromium (VI)	ug/g	ND	3047112			ND	3049160		0.2	
Moisture	%	13	3048128	12	3049044	15	3047295	22	1.0	3049044
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

Maxxam ID		PR0326		PR0327	PR0328	PR0328	PS0698		
Sampling Date		2012/11/15		2012/11/15	2012/11/15	2012/11/15	2012/11/15		
COC Number		380913-01-01		380913-01-01	380913-01-01	380913-01-01	B092147		
	Units	BH12-19 SA2	QC Batch	BH12-20 SA2	BH12-22 SA2	BH12-22 SA2 Lab-Dup	BH12-15 SA4	RDL	QC Batch

<b>Inorganics</b>									
Chromium (VI)	ug/g	ND	3049160					0.2	
Moisture	%	18	3047295	8.7	18	19	12	1.0	3048128
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch									

Maxxam Job #: B2I1866  
Report Date: 2012/12/05

Dillon Consulting Limited  
Client Project #: 12-7092-1000  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC  
Sampler Initials: VG

### ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PR0322	PR0324		PR0326		
Sampling Date		2012/11/15	2012/11/15		2012/11/15		
COC Number		380913-01-01	380913-01-01		380913-01-01		
	<b>Units</b>	<b>BH12-16 SA4</b>	<b>BH12-17 SA3</b>	<b>QC Batch</b>	<b>BH12-19 SA2</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Metals</b>							
Hot Water Ext. Boron (B)	ug/g	0.058	0.066	3051174	ND	0.050	3051331
Acid Extractable Sulphur (S)	ug/g	ND	ND	3051242	ND	50	3051242
Acid Extractable Aluminum (Al)	ug/g	11000	8900	3050560	7800	50	3050560
Acid Extractable Antimony (Sb)	ug/g	0.33	ND	3050560	ND	0.20	3050560
Acid Extractable Arsenic (As)	ug/g	6.5	5.7	3050560	4.7	1.0	3050560
Acid Extractable Barium (Ba)	ug/g	120	60	3050560	33	0.50	3050560
Acid Extractable Beryllium (Be)	ug/g	0.84	0.60	3050560	0.54	0.20	3050560
Acid Extractable Cadmium (Cd)	ug/g	0.12	ND	3050560	ND	0.10	3050560
Acid Extractable Calcium (Ca)	ug/g	1800	1100	3050560	550	50	3050560
Acid Extractable Chromium (Cr)	ug/g	18	16	3050560	12	1.0	3050560
Acid Extractable Cobalt (Co)	ug/g	11	10	3050560	6.8	0.10	3050560
Acid Extractable Copper (Cu)	ug/g	18	11	3050560	9.3	0.50	3050560
Acid Extractable Iron (Fe)	ug/g	25000	19000	3050560	17000	50	3050560
Acid Extractable Lead (Pb)	ug/g	12	9.7	3050560	8.6	1.0	3050560
Acid Extractable Magnesium (Mg)	ug/g	5400	4600	3050560	3700	50	3050560
Acid Extractable Manganese (Mn)	ug/g	620	1100	3050560	560	1.0	3050560
Acid Extractable Molybdenum (Mo)	ug/g	ND	ND	3050560	ND	0.50	3050560
Acid Extractable Nickel (Ni)	ug/g	22	18	3050560	14	0.50	3050560
Acid Extractable Phosphorus (P)	ug/g	440	290	3050560	310	50	3050560
Acid Extractable Potassium (K)	ug/g	770	470	3050560	410	200	3050560
Acid Extractable Selenium (Se)	ug/g	ND	ND	3050560	ND	0.50	3050560
Acid Extractable Silver (Ag)	ug/g	ND	ND	3050560	ND	0.20	3050560
Acid Extractable Sodium (Na)	ug/g	210	400	3050560	490	100	3050560
Acid Extractable Strontium (Sr)	ug/g	6.6	5.8	3050560	3.7	1.0	3050560
Acid Extractable Thallium (Tl)	ug/g	0.29	0.060	3050560	ND	0.050	3050560
Acid Extractable Vanadium (V)	ug/g	26	22	3050560	20	5.0	3050560
Acid Extractable Zinc (Zn)	ug/g	57	42	3050560	34	5.0	3050560

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

Maxxam Job #: B2I1866  
Report Date: 2012/12/05

Dillon Consulting Limited  
Client Project #: 12-7092-1000  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC  
Sampler Initials: VG

### SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		PR0322	PR0323	PR0325	PS0698		
Sampling Date		2012/11/15	2012/11/15	2012/11/15	2012/11/15		
COC Number		380913-01-01	380913-01-01	380913-01-01	B092147		
	Units	BH12-16 SA4	BH12-17 SA4	BH12-19 SA3	BH12-15 SA4	RDL	QC Batch

<b>Polyaromatic Hydrocarbons</b>							
Acenaphthene	ug/g	0.037	ND	ND	ND	0.0050	3047879
Acenaphthylene	ug/g	0.0086	ND	ND	ND	0.0050	3047879
Anthracene	ug/g	ND	ND	ND	ND	0.0050	3047879
Benzo(a)anthracene	ug/g	ND	ND	ND	ND	0.0050	3047879
Benzo(a)pyrene	ug/g	ND	ND	ND	ND	0.0050	3047879
Benzo(b,j)fluoranthene	ug/g	ND	ND	ND	ND	0.0050	3047879
Benzo(g,h,i)perylene	ug/g	ND	ND	ND	ND	0.0050	3047879
Benzo(k)fluoranthene	ug/g	ND	ND	ND	ND	0.0050	3047879
Chrysene	ug/g	ND	ND	ND	ND	0.0050	3047879
Dibenz(a,h)anthracene	ug/g	ND	ND	ND	ND	0.0050	3047879
Fluoranthene	ug/g	ND	ND	ND	ND	0.0050	3047879
Fluorene	ug/g	0.052	ND	ND	ND	0.0050	3047879
Indeno(1,2,3-cd)pyrene	ug/g	ND	ND	ND	ND	0.0050	3047879
1-Methylnaphthalene	ug/g	0.87	ND	ND	ND	0.0050	3047879
2-Methylnaphthalene	ug/g	1.5	ND	ND	ND	0.0050	3047879
Naphthalene	ug/g	0.67	ND	ND	ND	0.0050	3047879
Phenanthrene	ug/g	0.026	ND	ND	ND	0.0050	3047879
Pyrene	ug/g	ND	ND	ND	ND	0.0050	3047879
<b>Surrogate Recovery (%)</b>							
D10-Anthracene	%	87	82	82	83		3047879
D14-Terphenyl (FS)	%	85	85	81	85		3047879
D8-Acenaphthylene	%	116	108	102	106		3047879

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

Maxxam Job #: B2I1866  
Report Date: 2012/12/05

Dillon Consulting Limited  
Client Project #: 12-7092-1000  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC  
Sampler Initials: VG

### PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		PR0322	PR0322	PR0323	PR0325		PR0327		
Sampling Date		2012/11/15	2012/11/15	2012/11/15	2012/11/15		2012/11/15		
COC Number		380913-01-01	380913-01-01	380913-01-01	380913-01-01		380913-01-01		
	Units	BH12-16 SA4	BH12-16 SA4 Lab-Dup	BH12-17 SA4	BH12-19 SA3	QC Batch	BH12-20 SA2	RDL	QC Batch

<b>BTEX &amp; F1 Hydrocarbons</b>									
Benzene	ug/g	0.029	0.028	ND	ND	3049581	ND	0.005	3049581
Toluene	ug/g	ND	ND	ND	ND	3049581	ND	0.02	3049581
Ethylbenzene	ug/g	0.47	0.44	ND	ND	3049581	ND	0.01	3049581
o-Xylene	ug/g	0.07	0.06	ND	ND	3049581	ND	0.02	3049581
p+m-Xylene	ug/g	0.59	0.51	ND	ND	3049581	ND	0.04	3049581
Total Xylenes	ug/g	0.66	0.56	ND	ND	3049581	ND	0.04	3049581
F1 (C6-C10)	ug/g	280	260	ND	ND	3049581	ND	10	3049581
F1 (C6-C10) - BTEX	ug/g	280	260	ND	ND	3049581	ND	10	3049581
<b>F2-F4 Hydrocarbons</b>									
F2 (C10-C16 Hydrocarbons)	ug/g	1000		ND	ND	3046593	ND	10	3050382
F3 (C16-C34 Hydrocarbons)	ug/g	130		ND	ND	3046593	ND	10	3050382
F4 (C34-C50 Hydrocarbons)	ug/g	450		ND	ND	3046593	ND	10	3050382
Reached Baseline at C50	ug/g	No		Yes	Yes	3046593	Yes		3050382
<b>Surrogate Recovery (%)</b>									
1,4-Difluorobenzene	%	91	93	98	99	3049581	97		3049581
4-Bromofluorobenzene	%	110	111	103	102	3049581	104		3049581
D10-Ethylbenzene	%	97	101	84	84	3049581	83		3049581
D4-1,2-Dichloroethane	%	91	91	95	96	3049581	95		3049581
o-Terphenyl	%	96		97	96	3046593	98		3050382

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



Maxxam Job #: B2I1866  
Report Date: 2012/12/05

Dillon Consulting Limited  
Client Project #: 12-7092-1000  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC  
Sampler Initials: VG

### PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		PR0328		PS0698	PS0698		
Sampling Date		2012/11/15		2012/11/15	2012/11/15		
COC Number		380913-01-01		B092147	B092147		
	Units	BH12-22 SA2	QC Batch	BH12-15 SA4	BH12-15 SA4 Lab-Dup	RDL	QC Batch

<b>BTEX &amp; F1 Hydrocarbons</b>							
Benzene	ug/g	ND	3049581	ND	ND	0.005	3048079
Toluene	ug/g	ND	3049581	ND	ND	0.02	3048079
Ethylbenzene	ug/g	ND	3049581	ND	ND	0.01	3048079
o-Xylene	ug/g	ND	3049581	ND	ND	0.02	3048079
p+m-Xylene	ug/g	ND	3049581	ND	ND	0.04	3048079
Total Xylenes	ug/g	ND	3049581	ND	ND	0.04	3048079
F1 (C6-C10)	ug/g	ND	3049581	ND	ND	10	3048079
F1 (C6-C10) - BTEX	ug/g	ND	3049581	ND	ND	10	3048079
<b>F2-F4 Hydrocarbons</b>							
F2 (C10-C16 Hydrocarbons)	ug/g	ND	3050382	ND		10	3047973
F3 (C16-C34 Hydrocarbons)	ug/g	ND	3050382	ND		10	3047973
F4 (C34-C50 Hydrocarbons)	ug/g	ND	3050382	ND		10	3047973
Reached Baseline at C50	ug/g	Yes	3050382	Yes			3047973
<b>Surrogate Recovery (%)</b>							
1,4-Difluorobenzene	%	98	3049581	103	102		3048079
4-Bromofluorobenzene	%	102	3049581	107	102		3048079
D10-Ethylbenzene	%	83	3049581	69	86		3048079
D4-1,2-Dichloroethane	%	95	3049581	115	92		3048079
o-Terphenyl	%	99	3050382	105			3047973

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

Maxxam Job #: B211866  
Report Date: 2012/12/05

Dillon Consulting Limited  
Client Project #: 12-7092-1000  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC  
Sampler Initials: VG

Package 1	5.7°C
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Each temperature is the average of up to three cooler temperatures taken at receipt

**GENERAL COMMENTS**

Revised Report (2012/12/04): Metals parameters have been revised.

**Results relate only to the items tested.**

Dillon Consulting Limited  
Attention: Michelle Degarie  
Client Project #: 12-7092-1000  
P.O. #:  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC

### Quality Assurance Report

Maxxam Job Number: DB211866

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3046593 KLI	Matrix Spike	o-Terphenyl	2012/11/24		90	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/11/24		85	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2012/11/24		93	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2012/11/24		91	%	50 - 130
	Spiked Blank	o-Terphenyl	2012/11/24		89	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/11/24		87	%	80 - 120
		F3 (C16-C34 Hydrocarbons)	2012/11/24		95	%	80 - 120
		F4 (C34-C50 Hydrocarbons)	2012/11/24		93	%	80 - 120
	Method Blank	o-Terphenyl	2012/11/24		96	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/11/24	ND, RDL=10		ug/g	
		F3 (C16-C34 Hydrocarbons)	2012/11/24	ND, RDL=10		ug/g	
		F4 (C34-C50 Hydrocarbons)	2012/11/24	ND, RDL=10		ug/g	
	RPD	F2 (C10-C16 Hydrocarbons)	2012/11/24	NC		%	30
		F3 (C16-C34 Hydrocarbons)	2012/11/24	NC		%	30
		F4 (C34-C50 Hydrocarbons)	2012/11/24	NC		%	30
3047112 SAC	Matrix Spike	Chromium (VI)	2012/11/27		41 (1)	%	75 - 125
	QC Standard	Chromium (VI)	2012/11/27		99	%	75 - 125
	Spiked Blank	Chromium (VI)	2012/11/27		99	%	80 - 120
	Method Blank	Chromium (VI)	2012/11/27	ND, RDL=0.2		ug/g	
	RPD	Chromium (VI)	2012/11/27	NC		%	35
3047295 JL2	RPD	Moisture	2012/11/23	5.3		%	20
3047879 DTI	Matrix Spike	D10-Anthracene	2012/11/24		84	%	50 - 130
		D14-Terphenyl (FS)	2012/11/24		87	%	50 - 130
		D8-Acenaphthylene	2012/11/24		110	%	50 - 130
		Acenaphthene	2012/11/24		87	%	50 - 130
		Acenaphthylene	2012/11/24		99	%	50 - 130
		Anthracene	2012/11/24		90	%	50 - 130
		Benzo(a)anthracene	2012/11/24		100	%	50 - 130
		Benzo(a)pyrene	2012/11/24		76	%	50 - 130
		Benzo(b,j)fluoranthene	2012/11/24		81	%	50 - 130
		Benzo(g,h,i)perylene	2012/11/24		88	%	50 - 130
		Benzo(k)fluoranthene	2012/11/24		83	%	50 - 130
		Chrysene	2012/11/24		96	%	50 - 130
		Dibenz(a,h)anthracene	2012/11/24		93	%	50 - 130
		Fluoranthene	2012/11/24		92	%	50 - 130
		Fluorene	2012/11/24		102	%	50 - 130
		Indeno(1,2,3-cd)pyrene	2012/11/24		89	%	50 - 130
		1-Methylnaphthalene	2012/11/24		83	%	50 - 130
		2-Methylnaphthalene	2012/11/24		80	%	50 - 130
		Naphthalene	2012/11/24		77	%	50 - 130
		Phenanthrene	2012/11/24		89	%	50 - 130
		Pyrene	2012/11/24		94	%	50 - 130
	Spiked Blank	D10-Anthracene	2012/11/24		78	%	50 - 130
		D14-Terphenyl (FS)	2012/11/24		87	%	50 - 130
		D8-Acenaphthylene	2012/11/24		93	%	50 - 130
		Acenaphthene	2012/11/24		86	%	50 - 130
		Acenaphthylene	2012/11/24		86	%	50 - 130
		Anthracene	2012/11/24		86	%	50 - 130
		Benzo(a)anthracene	2012/11/24		92	%	50 - 130
		Benzo(a)pyrene	2012/11/24		89	%	50 - 130
		Benzo(b,j)fluoranthene	2012/11/24		102	%	50 - 130
		Benzo(g,h,i)perylene	2012/11/24		113	%	50 - 130
		Benzo(k)fluoranthene	2012/11/24		104	%	50 - 130
		Chrysene	2012/11/24		97	%	50 - 130
		Dibenz(a,h)anthracene	2012/11/24		111	%	50 - 130

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### Quality Assurance Report (Continued)

Maxxam Job Number: DB211866

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3047879 DTI	Spiked Blank	Fluoranthene	2012/11/24		89	%	50 - 130
		Fluorene	2012/11/24		99	%	50 - 130
		Indeno(1,2,3-cd)pyrene	2012/11/24		103	%	50 - 130
		1-Methylnaphthalene	2012/11/24		82	%	50 - 130
		2-Methylnaphthalene	2012/11/24		79	%	50 - 130
		Naphthalene	2012/11/24		77	%	50 - 130
		Phenanthrene	2012/11/24		89	%	50 - 130
	Method Blank	Pyrene	2012/11/24		92	%	50 - 130
		D10-Anthracene	2012/11/24		80	%	50 - 130
		D14-Terphenyl (FS)	2012/11/24		89	%	50 - 130
		D8-Acenaphthylene	2012/11/24		99	%	50 - 130
		Acenaphthene	2012/11/24	ND, RDL=0.0050		ug/g	
		Acenaphthylene	2012/11/24	ND, RDL=0.0050		ug/g	
		Anthracene	2012/11/24	ND, RDL=0.0050		ug/g	
		Benzo(a)anthracene	2012/11/24	ND, RDL=0.0050		ug/g	
		Benzo(a)pyrene	2012/11/24	ND, RDL=0.0050		ug/g	
		Benzo(b/j)fluoranthene	2012/11/24	ND, RDL=0.0050		ug/g	
		Benzo(g,h,i)perylene	2012/11/24	ND, RDL=0.0050		ug/g	
		Benzo(k)fluoranthene	2012/11/24	ND, RDL=0.0050		ug/g	
		Chrysene	2012/11/24	ND, RDL=0.0050		ug/g	
		Dibenz(a,h)anthracene	2012/11/24	ND, RDL=0.0050		ug/g	
		Fluoranthene	2012/11/24	ND, RDL=0.0050		ug/g	
		Fluorene	2012/11/24	ND, RDL=0.0050		ug/g	
		Indeno(1,2,3-cd)pyrene	2012/11/24	ND, RDL=0.0050		ug/g	
	RPD	1-Methylnaphthalene	2012/11/24	ND, RDL=0.0050		ug/g	
		2-Methylnaphthalene	2012/11/24	ND, RDL=0.0050		ug/g	
		Naphthalene	2012/11/24	ND, RDL=0.0050		ug/g	
		Phenanthrene	2012/11/24	ND, RDL=0.0050		ug/g	
		Pyrene	2012/11/24	ND, RDL=0.0050		ug/g	
		Acenaphthene	2012/11/24	NC		%	40
		Acenaphthylene	2012/11/24	NC		%	40
		Anthracene	2012/11/24	23.1		%	40
		Benzo(a)anthracene	2012/11/24	10.6		%	40
		Benzo(a)pyrene	2012/11/24	11.6		%	40
		Benzo(b/j)fluoranthene	2012/11/24	16.1		%	40
		Benzo(g,h,i)perylene	2012/11/24	15.5		%	40
		Benzo(k)fluoranthene	2012/11/24	2.1		%	40
		Chrysene	2012/11/24	3.7		%	40
		Dibenz(a,h)anthracene	2012/11/24	NC		%	40
		Fluoranthene	2012/11/24	17.5		%	40
		Fluorene	2012/11/24	NC		%	40
		Indeno(1,2,3-cd)pyrene	2012/11/24	12.8		%	40
		1-Methylnaphthalene	2012/11/24	NC		%	40
		2-Methylnaphthalene	2012/11/24	NC		%	40
		Naphthalene	2012/11/24	NC		%	40
		Phenanthrene	2012/11/24	29.9		%	40
		Pyrene	2012/11/24	14.5		%	40
3047973 KLI	Matrix Spike	o-Terphenyl	2012/11/26		96	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/11/26		93	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2012/11/26		100	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2012/11/26		96	%	50 - 130
	Spiked Blank	o-Terphenyl	2012/11/26		94	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/11/26		92	%	80 - 120
		F3 (C16-C34 Hydrocarbons)	2012/11/26		99	%	80 - 120
		F4 (C34-C50 Hydrocarbons)	2012/11/26		94	%	80 - 120

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## Quality Assurance Report (Continued)

Maxxam Job Number: DB211866

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3047973 KLI	Method Blank	o-Terphenyl	2012/11/26		99	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/11/26	ND, RDL=10		ug/g	
		F3 (C16-C34 Hydrocarbons)	2012/11/26	ND, RDL=10		ug/g	
		F4 (C34-C50 Hydrocarbons)	2012/11/26	ND, RDL=10		ug/g	
	RPD	F2 (C10-C16 Hydrocarbons)	2012/11/26	NC		%	30
		F3 (C16-C34 Hydrocarbons)	2012/11/26	NC		%	30
		F4 (C34-C50 Hydrocarbons)	2012/11/26	NC		%	30
3048079 LRA	Matrix Spike [PS0698-01]	1,4-Difluorobenzene	2012/11/27		99	%	60 - 140
		4-Bromofluorobenzene	2012/11/27		104	%	60 - 140
		D10-Ethylbenzene	2012/11/27		84	%	60 - 140
		D4-1,2-Dichloroethane	2012/11/27		92	%	60 - 140
		Benzene	2012/11/27		96	%	60 - 140
		Toluene	2012/11/27		79	%	60 - 140
		Ethylbenzene	2012/11/27		85	%	60 - 140
		o-Xylene	2012/11/27		79	%	60 - 140
		p+m-Xylene	2012/11/27		74	%	60 - 140
		F1 (C6-C10)	2012/11/27		100	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene	2012/11/27		100	%	60 - 140
		4-Bromofluorobenzene	2012/11/27		104	%	60 - 140
		D10-Ethylbenzene	2012/11/27		81	%	60 - 140
		D4-1,2-Dichloroethane	2012/11/27		93	%	60 - 140
		Benzene	2012/11/27		102	%	60 - 130
		Toluene	2012/11/27		85	%	60 - 130
		Ethylbenzene	2012/11/27		92	%	60 - 130
		o-Xylene	2012/11/27		86	%	60 - 130
		p+m-Xylene	2012/11/27		80	%	60 - 130
		F1 (C6-C10)	2012/11/27		100	%	80 - 120
	Method Blank	1,4-Difluorobenzene	2012/11/27		98	%	60 - 140
		4-Bromofluorobenzene	2012/11/27		103	%	60 - 140
		D10-Ethylbenzene	2012/11/27		79	%	60 - 140
		D4-1,2-Dichloroethane	2012/11/27		95	%	60 - 140
		Benzene	2012/11/27	ND, RDL=0.005		ug/g	
		Toluene	2012/11/27	ND, RDL=0.02		ug/g	
		Ethylbenzene	2012/11/27	ND, RDL=0.01		ug/g	
		o-Xylene	2012/11/27	ND, RDL=0.02		ug/g	
		p+m-Xylene	2012/11/27	ND, RDL=0.04		ug/g	
		Total Xylenes	2012/11/27	ND, RDL=0.04		ug/g	
		F1 (C6-C10)	2012/11/27	ND, RDL=10		ug/g	
		F1 (C6-C10) - BTEX	2012/11/27	ND, RDL=10		ug/g	
	RPD [PS0698-01]	Benzene	2012/11/27	NC		%	50
		Toluene	2012/11/27	NC		%	50
		Ethylbenzene	2012/11/27	NC		%	50
		o-Xylene	2012/11/27	NC		%	50
		p+m-Xylene	2012/11/27	NC		%	50
		Total Xylenes	2012/11/27	NC		%	50
		F1 (C6-C10)	2012/11/27	NC		%	50
		F1 (C6-C10) - BTEX	2012/11/27	NC		%	50
3048128 BRL	RPD [PR0328-01]	Moisture	2012/11/24	3.7		%	20
3049044 N_P	RPD	Moisture	2012/11/26	3.8		%	20
3049160 SAC	Matrix Spike	Chromium (VI)	2012/11/28		73 (1)	%	75 - 125
	QC Standard	Chromium (VI)	2012/11/28		100	%	75 - 125
	Spiked Blank	Chromium (VI)	2012/11/28		97	%	80 - 120
	Method Blank	Chromium (VI)	2012/11/28	ND, RDL=0.2		ug/g	
	RPD	Chromium (VI)	2012/11/28	NC		%	35



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### Quality Assurance Report (Continued)

Maxxam Job Number: DB211866

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3049581 LRA	Matrix Spike [PR0322-01]	1,4-Difluorobenzene	2012/11/27		93	%	60 - 140
		4-Bromofluorobenzene	2012/11/27		112	%	60 - 140
		D10-Ethylbenzene	2012/11/27		104	%	60 - 140
		D4-1,2-Dichloroethane	2012/11/27		89	%	60 - 140
		Benzene	2012/11/27		102	%	60 - 140
		Toluene	2012/11/27		87	%	60 - 140
		Ethylbenzene	2012/11/27		93	%	60 - 140
		o-Xylene	2012/11/27		92	%	60 - 140
		p+m-Xylene	2012/11/27		86	%	60 - 140
		F1 (C6-C10)	2012/11/27		NC	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene	2012/11/27		98	%	60 - 140
		4-Bromofluorobenzene	2012/11/27		104	%	60 - 140
		D10-Ethylbenzene	2012/11/27		88	%	60 - 140
		D4-1,2-Dichloroethane	2012/11/27		94	%	60 - 140
		Benzene	2012/11/27		112	%	60 - 130
		Toluene	2012/11/27		93	%	60 - 130
		Ethylbenzene	2012/11/27		102	%	60 - 130
		o-Xylene	2012/11/27		95	%	60 - 130
		p+m-Xylene	2012/11/27		90	%	60 - 130
		F1 (C6-C10)	2012/11/27		100	%	80 - 120
	Method Blank	1,4-Difluorobenzene	2012/11/27		99	%	60 - 140
		4-Bromofluorobenzene	2012/11/27		102	%	60 - 140
		D10-Ethylbenzene	2012/11/27		85	%	60 - 140
		D4-1,2-Dichloroethane	2012/11/27		95	%	60 - 140
		Benzene	2012/11/27	ND, RDL=0.005		ug/g	
		Toluene	2012/11/27	ND, RDL=0.02		ug/g	
		Ethylbenzene	2012/11/27	ND, RDL=0.01		ug/g	
		o-Xylene	2012/11/27	ND, RDL=0.02		ug/g	
		p+m-Xylene	2012/11/27	ND, RDL=0.04		ug/g	
		Total Xylenes	2012/11/27	ND, RDL=0.04		ug/g	
	RPD [PR0322-01]	F1 (C6-C10)	2012/11/27	ND, RDL=10		ug/g	
		F1 (C6-C10) - BTEX	2012/11/27	ND, RDL=10		ug/g	
		Benzene	2012/11/27	4.4		%	50
		Toluene	2012/11/27	NC		%	50
		Ethylbenzene	2012/11/27	7.0		%	50
		o-Xylene	2012/11/27	NC		%	50
		p+m-Xylene	2012/11/27	14.6		%	50
		Total Xylenes	2012/11/27	15.5		%	50
		F1 (C6-C10)	2012/11/27	8.0		%	50
		F1 (C6-C10) - BTEX	2012/11/27	7.9		%	50
3050382 BLZ	Matrix Spike	o-Terphenyl	2012/11/28		94	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/11/28		100	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2012/11/28		99	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2012/11/28		98	%	50 - 130
	Spiked Blank	o-Terphenyl	2012/11/28		88	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/11/28		90	%	80 - 120
		F3 (C16-C34 Hydrocarbons)	2012/11/28		99	%	80 - 120
		F4 (C34-C50 Hydrocarbons)	2012/11/28		86	%	80 - 120
	Method Blank	o-Terphenyl	2012/11/28		100	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/11/28	ND, RDL=10		ug/g	
		F3 (C16-C34 Hydrocarbons)	2012/11/28	ND, RDL=10		ug/g	
		F4 (C34-C50 Hydrocarbons)	2012/11/28	ND, RDL=10		ug/g	
	RPD	F2 (C10-C16 Hydrocarbons)	2012/11/28	NC		%	30
		F3 (C16-C34 Hydrocarbons)	2012/11/28	NC		%	30

Dillon Consulting Limited  
Attention: Michelle Degarie  
Client Project #: 12-7092-1000  
P.O. #:  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC

### Quality Assurance Report (Continued)

Maxxam Job Number: DB211866

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3050382 BLZ	RPD	F4 (C34-C50 Hydrocarbons)	2012/11/28	NC		%	30
3050560 VIV	Matrix Spike	Acid Extractable Aluminum (Al)	2012/11/29		NC	%	75 - 125
		Acid Extractable Antimony (Sb)	2012/11/29		94	%	75 - 125
		Acid Extractable Arsenic (As)	2012/11/29		101	%	75 - 125
		Acid Extractable Barium (Ba)	2012/11/29		NC (2)	%	75 - 125
		Acid Extractable Beryllium (Be)	2012/11/29		97	%	75 - 125
		Acid Extractable Cadmium (Cd)	2012/11/29		97	%	75 - 125
		Acid Extractable Calcium (Ca)	2012/11/29		NC	%	75 - 125
		Acid Extractable Chromium (Cr)	2012/11/29		99	%	75 - 125
		Acid Extractable Cobalt (Co)	2012/11/29		95	%	75 - 125
		Acid Extractable Copper (Cu)	2012/11/29		89	%	75 - 125
		Acid Extractable Iron (Fe)	2012/11/29		NC	%	75 - 125
		Acid Extractable Lead (Pb)	2012/11/29		90	%	75 - 125
		Acid Extractable Magnesium (Mg)	2012/11/29		NC	%	75 - 125
		Acid Extractable Manganese (Mn)	2012/11/29		NC	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2012/11/29		95	%	75 - 125
		Acid Extractable Nickel (Ni)	2012/11/29		101	%	75 - 125
		Acid Extractable Phosphorus (P)	2012/11/29		NC	%	75 - 125
		Acid Extractable Potassium (K)	2012/11/29		NC	%	75 - 125
		Acid Extractable Selenium (Se)	2012/11/29		100	%	75 - 125
		Acid Extractable Silver (Ag)	2012/11/29		97	%	75 - 125
		Acid Extractable Sodium (Na)	2012/11/29		98	%	75 - 125
		Acid Extractable Strontium (Sr)	2012/11/29		NC	%	75 - 125
		Acid Extractable Thallium (Tl)	2012/11/29		90	%	75 - 125
		Acid Extractable Vanadium (V)	2012/11/29		93	%	75 - 125
		Acid Extractable Zinc (Zn)	2012/11/29		NC (2)	%	75 - 125
	Spiked Blank	Acid Extractable Aluminum (Al)	2012/11/29		114	%	80 - 120
		Acid Extractable Antimony (Sb)	2012/11/29		100	%	80 - 120
		Acid Extractable Arsenic (As)	2012/11/29		104	%	80 - 120
		Acid Extractable Barium (Ba)	2012/11/29		105	%	80 - 120
		Acid Extractable Beryllium (Be)	2012/11/29		98	%	80 - 120
		Acid Extractable Cadmium (Cd)	2012/11/29		98	%	80 - 120
		Acid Extractable Calcium (Ca)	2012/11/29		105	%	80 - 120
		Acid Extractable Chromium (Cr)	2012/11/29		100	%	80 - 120
		Acid Extractable Cobalt (Co)	2012/11/29		97	%	80 - 120
		Acid Extractable Copper (Cu)	2012/11/29		96	%	80 - 120
		Acid Extractable Iron (Fe)	2012/11/29		109	%	80 - 120
		Acid Extractable Lead (Pb)	2012/11/29		98	%	80 - 120
		Acid Extractable Magnesium (Mg)	2012/11/29		107	%	80 - 120
		Acid Extractable Manganese (Mn)	2012/11/29		106	%	80 - 120
		Acid Extractable Molybdenum (Mo)	2012/11/29		97	%	80 - 120
		Acid Extractable Nickel (Ni)	2012/11/29		103	%	80 - 120
		Acid Extractable Phosphorus (P)	2012/11/29		122 (3)	%	80 - 120
		Acid Extractable Potassium (K)	2012/11/29		102	%	80 - 120
		Acid Extractable Selenium (Se)	2012/11/29		101	%	80 - 120
		Acid Extractable Silver (Ag)	2012/11/29		97	%	80 - 120
		Acid Extractable Sodium (Na)	2012/11/29		100	%	80 - 120
		Acid Extractable Strontium (Sr)	2012/11/29		103	%	80 - 120
		Acid Extractable Thallium (Tl)	2012/11/29		91	%	80 - 120
		Acid Extractable Vanadium (V)	2012/11/29		94	%	80 - 120
		Acid Extractable Zinc (Zn)	2012/11/29		102	%	80 - 120
	Method Blank	Acid Extractable Aluminum (Al)	2012/11/29	ND, RDL=50		ug/g	
		Acid Extractable Antimony (Sb)	2012/11/29	ND, RDL=0.20		ug/g	
		Acid Extractable Arsenic (As)	2012/11/29	ND, RDL=1.0		ug/g	
		Acid Extractable Barium (Ba)	2012/11/29	ND, RDL=0.50		ug/g	

Dillon Consulting Limited  
Attention: Michelle Degarie  
Client Project #: 12-7092-1000  
P.O. #:  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC

### Quality Assurance Report (Continued)

Maxxam Job Number: DB211866

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3050560 VIV	Method Blank	Acid Extractable Beryllium (Be)	2012/11/29	ND, RDL=0.20		ug/g	
		Acid Extractable Cadmium (Cd)	2012/11/29	ND, RDL=0.10		ug/g	
		Acid Extractable Calcium (Ca)	2012/11/29	ND, RDL=50		ug/g	
		Acid Extractable Chromium (Cr)	2012/11/29	ND, RDL=1.0		ug/g	
		Acid Extractable Cobalt (Co)	2012/11/29	ND, RDL=0.10		ug/g	
		Acid Extractable Copper (Cu)	2012/11/29	ND, RDL=0.50		ug/g	
		Acid Extractable Iron (Fe)	2012/11/29	ND, RDL=50		ug/g	
		Acid Extractable Lead (Pb)	2012/11/29	ND, RDL=1.0		ug/g	
		Acid Extractable Magnesium (Mg)	2012/11/29	ND, RDL=50		ug/g	
		Acid Extractable Manganese (Mn)	2012/11/29	ND, RDL=1.0		ug/g	
		Acid Extractable Molybdenum (Mo)	2012/11/29	ND, RDL=0.50		ug/g	
		Acid Extractable Nickel (Ni)	2012/11/29	ND, RDL=0.50		ug/g	
		Acid Extractable Phosphorus (P)	2012/11/29	ND, RDL=50		ug/g	
		Acid Extractable Potassium (K)	2012/11/29	ND, RDL=200		ug/g	
		Acid Extractable Selenium (Se)	2012/11/29	ND, RDL=0.50		ug/g	
		Acid Extractable Silver (Ag)	2012/11/29	ND, RDL=0.20		ug/g	
		Acid Extractable Sodium (Na)	2012/11/29	ND, RDL=100		ug/g	
		Acid Extractable Strontium (Sr)	2012/11/29	ND, RDL=1.0		ug/g	
		Acid Extractable Thallium (Tl)	2012/11/29	ND, RDL=0.050		ug/g	
		Acid Extractable Vanadium (V)	2012/11/29	ND, RDL=5.0		ug/g	
	RPD	Acid Extractable Zinc (Zn)	2012/11/29	ND, RDL=5.0		ug/g	
		Acid Extractable Antimony (Sb)	2012/11/29	NC		%	30
		Acid Extractable Arsenic (As)	2012/11/29	NC		%	30
		Acid Extractable Barium (Ba)	2012/11/29	1.7		%	30
		Acid Extractable Beryllium (Be)	2012/11/29	NC		%	30
		Acid Extractable Cadmium (Cd)	2012/11/29	NC		%	30
		Acid Extractable Chromium (Cr)	2012/11/29	1.6		%	30
		Acid Extractable Cobalt (Co)	2012/11/29	1.4		%	30
		Acid Extractable Copper (Cu)	2012/11/29	3.5		%	30
		Acid Extractable Lead (Pb)	2012/11/29	0.7		%	30
		Acid Extractable Molybdenum (Mo)	2012/11/29	NC		%	30
		Acid Extractable Nickel (Ni)	2012/11/29	1.1		%	30
		Acid Extractable Selenium (Se)	2012/11/29	NC		%	30
		Acid Extractable Silver (Ag)	2012/11/29	NC		%	30
		Acid Extractable Thallium (Tl)	2012/11/29	NC		%	30
		Acid Extractable Vanadium (V)	2012/11/29	NC		%	30
		Acid Extractable Zinc (Zn)	2012/11/29	4.4		%	30
3051174 AFZ	Spiked Blank	Hot Water Ext. Boron (B)	2012/11/28		97	%	75 - 125
	Method Blank	Hot Water Ext. Boron (B)	2012/11/28	ND, RDL=0.050		ug/g	
	RPD	Hot Water Ext. Boron (B)	2012/11/28	NC		%	35
3051242 SUK	Matrix Spike	Acid Extractable Sulphur (S)	2012/11/28		101	%	75 - 125
	Spiked Blank	Acid Extractable Sulphur (S)	2012/11/28		100	%	80 - 120
	Method Blank	Acid Extractable Sulphur (S)	2012/11/28	ND, RDL=50		ug/g	
	RPD	Acid Extractable Sulphur (S)	2012/11/28	NC		%	30
3051331 AFZ	Spiked Blank	Hot Water Ext. Boron (B)	2012/11/28		93	%	75 - 125
	Method Blank	Hot Water Ext. Boron (B)	2012/11/28	ND, RDL=0.050		ug/g	
	RPD	Hot Water Ext. Boron (B)	2012/11/28	NC		%	35

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

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.

Dillon Consulting Limited  
Attention: Michelle Degarie  
Client Project #: 12-7092-1000  
P.O. #:  
Site Location: SUPERANNUATION PARKING LOT, SHEDIAC

### Quality Assurance Report (Continued)

Maxxam Job Number: DB211866

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 ) The matrix spike recovery was below the lower control limit. This may be due in part to the reducing environment of the sample.
- ( 2 ) The recovery in the matrix spike was not calculated (NC). Spiked concentration was less than 2x that native to the sample.
- ( 3 ) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

## Validation Signature Page

**Maxxam Job #: B2I1866**

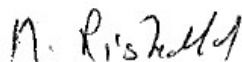
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The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



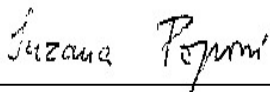

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Cristina Carriere, Scientific Services



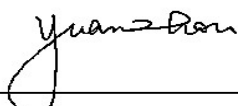

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Medhat Riskallah, Manager, Hydrocarbon Department




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Suzana Popovic, Supervisor, Hydrocarbons




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Yuan Zhou, gc/ms Technician

=====

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.

Your Project #: 12-7092-1000/SHEDIAC  
Your C.O.C. #: B70625

**Attention: Michelle Degarie**

Dillon Consulting Limited  
1149 Smythe St  
Fredericton, NB  
E3B 3H4

**Report Date: 2012/12/31**

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B2K2007**

**Received: 2012/12/21, 09:31**

Sample Matrix: Soil  
# Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Petroleum Hydro. CCME F1 & BTEX in Soil	4	2012/12/24	2012/12/28	CAM SOP-00315	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil	4	2012/12/24	2012/12/27	CAM SOP-00316	CCME CWS
F4G (CCME Hydrocarbons Gravimetric)	3	2012/12/28	2012/12/29	CAM SOP-00316	CCME CWS
Moisture	4	N/A	2012/12/24	CAM SOP-00445	R.Carter,1993

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

**Encryption Key**

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

Christine Gripton, Project Manager  
Email: CGripton@maxxam.ca  
Phone# (800) 268-7396 Ext:250

=====

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Total cover pages: 1

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Maxxam Job #: B2K2007  
Report Date: 2012/12/31

Dillon Consulting Limited  
Client Project #: 12-7092-1000/SHEDIAC

### RESULTS OF ANALYSES OF SOIL

Maxxam ID		QB6635	QB6636	QB6637	QB6638		
Sampling Date		2012/11/15	2012/11/15	2012/11/15	2012/11/15		
COC Number		B70625	B70625	B70625	B70625		
	<b>Units</b>	<b>BH12-12 SA2</b>	<b>BH12-13 SA2</b>	<b>BH12-14 SA2</b>	<b>BH12-21 SA1</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Inorganics</b>							
Moisture	%	5.2	9.0	13	8.1	1.0	3080142

RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch

Maxxam Job #: B2K2007  
Report Date: 2012/12/31

Dillon Consulting Limited  
Client Project #: 12-7092-1000/SHEDIAC

### PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		QB6635	QB6635	QB6636	QB6637	QB6638		
Sampling Date		2012/11/15	2012/11/15	2012/11/15	2012/11/15	2012/11/15		
COC Number		B70625	B70625	B70625	B70625	B70625		
	<b>Units</b>	<b>BH12-12 SA2</b>	<b>BH12-12 SA2 Lab-Dup</b>	<b>BH12-13 SA2</b>	<b>BH12-14 SA2</b>	<b>BH12-21 SA1</b>	<b>RDL</b>	<b>QC Batch</b>

<b>BTEX &amp; F1 Hydrocarbons</b>								
Benzene	ug/g	ND	0.006	ND	ND	0.007	0.005	3081388
Toluene	ug/g	ND	0.02	ND	ND	ND	0.02	3081388
Ethylbenzene	ug/g	ND	ND	ND	ND	ND	0.01	3081388
o-Xylene	ug/g	ND	ND	ND	ND	ND	0.02	3081388
p+m-Xylene	ug/g	ND	ND	ND	ND	ND	0.04	3081388
Total Xylenes	ug/g	ND	ND	ND	ND	ND	0.04	3081388
F1 (C6-C10)	ug/g	ND	ND	ND	ND	ND	10	3081388
F1 (C6-C10) - BTEX	ug/g	ND	ND	ND	ND	ND	10	3081388
<b>F2-F4 Hydrocarbons</b>								
F4G-sg (Grav. Heavy Hydrocarbons)	ug/g	2000			1400	310	100	3082036
F2 (C10-C16 Hydrocarbons)	ug/g	ND		ND	13	ND	10	3079992
F3 (C16-C34 Hydrocarbons)	ug/g	31		ND	100	ND	10	3079992
F4 (C34-C50 Hydrocarbons)	ug/g	290		ND	450	16	10	3079992
Reached Baseline at C50	ug/g	No		Yes	No	No		3079992
<b>Surrogate Recovery (%)</b>								
1,4-Difluorobenzene	%	98	98	98	97	96		3081388
4-Bromofluorobenzene	%	109	109	109	109	110		3081388
D10-Ethylbenzene	%	77	78	82	75	78		3081388
D4-1,2-Dichloroethane	%	101	100	101	101	101		3081388
o-Terphenyl	%	95		98	96	96		3079992
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

Maxxam Job #: B2K2007  
Report Date: 2012/12/31

Dillon Consulting Limited  
Client Project #: 12-7092-1000/SHEDIAC

#### GENERAL COMMENTS

Analysis was performed past the sample holding time. This may increase the variability associated with these results.

**Results relate only to the items tested.**

Dillon Consulting Limited  
Attention: Michelle Degarie  
Client Project #: 12-7092-1000/SHEDIAC  
P.O. #:  
Site Location:

Quality Assurance Report  
Maxxam Job Number: MB2K2007

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3079992 KLI	Matrix Spike	o-Terphenyl	2012/12/27		88	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/12/27		95	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2012/12/27		98	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2012/12/27		98	%	50 - 130
	Spiked Blank	o-Terphenyl	2012/12/27		93	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/12/27		97	%	80 - 120
		F3 (C16-C34 Hydrocarbons)	2012/12/27		99	%	80 - 120
		F4 (C34-C50 Hydrocarbons)	2012/12/27		100	%	80 - 120
	Method Blank	o-Terphenyl	2012/12/27		97	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/12/27	ND, RDL=10		ug/g	
		F3 (C16-C34 Hydrocarbons)	2012/12/27	ND, RDL=10		ug/g	
		F4 (C34-C50 Hydrocarbons)	2012/12/27	ND, RDL=10		ug/g	
	RPD	F2 (C10-C16 Hydrocarbons)	2012/12/27	NC		%	30
		F3 (C16-C34 Hydrocarbons)	2012/12/27	NC		%	30
		F4 (C34-C50 Hydrocarbons)	2012/12/27	NC		%	30
3080142 JL2	RPD	Moisture	2012/12/24	2.9		%	20
3081388 LRA	Matrix Spike [QB6635-01]	1,4-Difluorobenzene	2012/12/28		97	%	60 - 140
		4-Bromofluorobenzene	2012/12/28		110	%	60 - 140
		D10-Ethylbenzene	2012/12/28		77	%	60 - 140
		D4-1,2-Dichloroethane	2012/12/28		102	%	60 - 140
	Spiked Blank	Benzene	2012/12/28		90	%	60 - 140
		Toluene	2012/12/28		73	%	60 - 140
		Ethylbenzene	2012/12/28		79	%	60 - 140
		o-Xylene	2012/12/28		75	%	60 - 140
		p+m-Xylene	2012/12/28		69	%	60 - 140
		F1 (C6-C10)	2012/12/28		98	%	60 - 140
		1,4-Difluorobenzene	2012/12/28		102	%	60 - 140
		4-Bromofluorobenzene	2012/12/28		108	%	60 - 140
		D10-Ethylbenzene	2012/12/28		101	%	60 - 140
		D4-1,2-Dichloroethane	2012/12/28		101	%	60 - 140
		Benzene	2012/12/28		114	%	60 - 130
		Toluene	2012/12/28		93	%	60 - 130
		Ethylbenzene	2012/12/28		101	%	60 - 130
		o-Xylene	2012/12/28		92	%	60 - 130
		p+m-Xylene	2012/12/28		86	%	60 - 130
	Method Blank	F1 (C6-C10)	2012/12/28		103	%	80 - 120
		1,4-Difluorobenzene	2012/12/28		99	%	60 - 140
		4-Bromofluorobenzene	2012/12/28		109	%	60 - 140
		D10-Ethylbenzene	2012/12/28		85	%	60 - 140
		D4-1,2-Dichloroethane	2012/12/28		100	%	60 - 140
		Benzene	2012/12/28	ND, RDL=0.005		ug/g	
		Toluene	2012/12/28	ND, RDL=0.02		ug/g	
		Ethylbenzene	2012/12/28	ND, RDL=0.01		ug/g	
		o-Xylene	2012/12/28	ND, RDL=0.02		ug/g	
		p+m-Xylene	2012/12/28	ND, RDL=0.04		ug/g	
		Total Xylenes	2012/12/28	ND, RDL=0.04		ug/g	
		F1 (C6-C10)	2012/12/28	ND, RDL=10		ug/g	
		F1 (C6-C10) - BTEX	2012/12/28	ND, RDL=10		ug/g	
	RPD [QB6635-01]	Benzene	2012/12/28	NC		%	50
		Toluene	2012/12/28	NC		%	50
		Ethylbenzene	2012/12/28	NC		%	50
		o-Xylene	2012/12/28	NC		%	50
		p+m-Xylene	2012/12/28	NC		%	50
		Total Xylenes	2012/12/28	NC		%	50

Dillon Consulting Limited  
Attention: Michelle Degarie  
Client Project #: 12-7092-1000/SHEDIAC  
P.O. #:  
Site Location:

### Quality Assurance Report (Continued)

Maxxam Job Number: MB2K2007

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3081388 LRA	RPD [QB6635-01]	F1 (C6-C10)	2012/12/28	NC		%	50
		F1 (C6-C10) - BTEX	2012/12/28	NC		%	50
3082036 RTY	Matrix Spike	F4G-sg (Grav. Heavy Hydrocarbons)	2012/12/29		88	%	65 - 135
	Spiked Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2012/12/29		89	%	65 - 135
	Method Blank	F4G-sg (Grav. Heavy Hydrocarbons)	2012/12/29	ND, RDL=100		ug/g	
	RPD	F4G-sg (Grav. Heavy Hydrocarbons)	2012/12/29	NC		%	50

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

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 (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.

## Validation Signature Page

Maxxam Job #: B2K2007

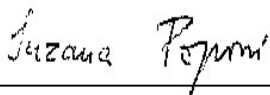
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The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



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Cristina Carriere, Scientific Services



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Suzana Popovic, Supervisor, Hydrocarbons

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



Your Project #: 12-7092  
 Site Location: SHEDIAC  
 Your C.O.C. #: B70645

**Attention: Michelle Degarie**

Dillon Consulting Limited  
 1149 Smythe St  
 Fredericton, NB  
 E3B 3H4

**Report Date: 2013/02/15**

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B322399**

**Received: 2013/02/14, 08:54**

Sample Matrix: Soil  
 # Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Petroleum Hydro. CCME F1 & BTEX in Soil	10	2013/02/14	2013/02/15	CAM SOP-00315	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil	10	2013/02/14	2013/02/14	CAM SOP-00316	CCME CWS
Moisture	10	N/A	2013/02/14	CAM SOP-00445	R.Carter,1993

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

**Encryption Key**

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

Christine Gripton, Project Manager  
 Email: CGripton@maxxam.ca  
 Phone# (800) 268-7396 Ext:250

=====

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

Total cover pages: 1

Maxxam Job #: B322399  
Report Date: 2013/02/15

Dillon Consulting Limited  
Client Project #: 12-7092  
Site Location: SHEDIAC

## RESULTS OF ANALYSES OF SOIL

Maxxam ID		QO1061	QO1061	QO1062	QO1063	QO1064	QO1065	QO1066		
Sampling Date		2013/02/10	2013/02/10	2013/02/10	2013/02/10	2013/02/10	2013/02/10	2013/02/10		
COC Number		B70645	B70645	B70645	B70645	B70645	B70645	B70645		
	Units	BH13-23 SA2	BH13-23 SA2 Lab-Dup	BH13-24 SA2	BH13-25 SA2	BH13-26 SA2	BH13-27 SA2	BH13-28 SA2	RDL	QC Batch

<b>Inorganics</b>										
Moisture	%	6.6	6.5	19	6.8	9.4	10	6.6	1.0	3123866

RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch

Maxxam ID		QO1067	QO1068	QO1069	QO1070		
Sampling Date		2013/02/10	2013/02/10	2013/02/10	2013/02/10		
COC Number		B70645	B70645	B70645	B70645		
	Units	BH13-29 SA1	BH13-30 SA1	BH13-30 SA2	FIELD DUP A	RDL	QC Batch

<b>Inorganics</b>							
Moisture	%	8.4	16	13	6.1	1.0	3123866

RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch

Maxxam Job #: B322399  
Report Date: 2013/02/15

Dillon Consulting Limited  
Client Project #: 12-7092  
Site Location: SHEDIAC

### PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		QO1061	QO1061	QO1062	QO1063	QO1064	QO1065		
Sampling Date		2013/02/10	2013/02/10	2013/02/10	2013/02/10	2013/02/10	2013/02/10		
COC Number		B70645	B70645	B70645	B70645	B70645	B70645		
	<b>Units</b>	<b>BH13-23 SA2</b>	<b>BH13-23 SA2 Lab-Dup</b>	<b>BH13-24 SA2</b>	<b>BH13-25 SA2</b>	<b>BH13-26 SA2</b>	<b>BH13-27 SA2</b>	<b>RDL</b>	<b>QC Batch</b>

<b>BTEX &amp; F1 Hydrocarbons</b>									
Benzene	ug/g	0.009	0.005	0.008	ND	ND	ND	0.005	3124265
Toluene	ug/g	0.04	0.02	0.03	ND	ND	ND	0.02	3124265
Ethylbenzene	ug/g	ND	ND	ND	ND	ND	ND	0.01	3124265
o-Xylene	ug/g	ND	ND	ND	ND	ND	ND	0.02	3124265
p+m-Xylene	ug/g	ND	ND	ND	ND	ND	ND	0.04	3124265
Total Xylenes	ug/g	ND	ND	ND	ND	ND	ND	0.04	3124265
F1 (C6-C10)	ug/g	ND	ND	ND	ND	ND	ND	10	3124265
F1 (C6-C10) - BTEX	ug/g	ND	ND	ND	ND	ND	ND	10	3124265
<b>F2-F4 Hydrocarbons</b>									
F2 (C10-C16 Hydrocarbons)	ug/g	ND		ND	ND	ND	ND	10	3124084
F3 (C16-C34 Hydrocarbons)	ug/g	ND		16	ND	ND	ND	10	3124084
F4 (C34-C50 Hydrocarbons)	ug/g	ND		ND	ND	ND	ND	10	3124084
Reached Baseline at C50	ug/g	Yes		Yes	Yes	Yes	Yes		3124084
<b>Surrogate Recovery (%)</b>									
1,4-Difluorobenzene	%	100	98	98	98	98	100		3124265
4-Bromofluorobenzene	%	103	104	105	105	104	104		3124265
D10-Ethylbenzene	%	90	88	92	88	90	91		3124265
D4-1,2-Dichloroethane	%	100	98	99	100	100	99		3124265
o-Terphenyl	%	103		105	104	104	104		3124084

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

Maxxam Job #: B322399  
Report Date: 2013/02/15

Dillon Consulting Limited  
Client Project #: 12-7092  
Site Location: SHEDIAC

### PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		QO1066	QO1067	QO1068	QO1069	QO1070		
Sampling Date		2013/02/10	2013/02/10	2013/02/10	2013/02/10	2013/02/10		
COC Number		B70645	B70645	B70645	B70645	B70645		
	<b>Units</b>	<b>BH13-28 SA2</b>	<b>BH13-29 SA1</b>	<b>BH13-30 SA1</b>	<b>BH13-30 SA2</b>	<b>FIELD DUP A</b>	<b>RDL</b>	<b>QC Batch</b>

<b>BTEX &amp; F1 Hydrocarbons</b>								
Benzene	ug/g	ND	ND	0.23	ND	ND	0.005	3124265
Toluene	ug/g	ND	ND	0.70	ND	ND	0.02	3124265
Ethylbenzene	ug/g	ND	ND	0.05	ND	ND	0.01	3124265
o-Xylene	ug/g	ND	ND	0.17	ND	ND	0.02	3124265
p+m-Xylene	ug/g	ND	ND	0.50	ND	ND	0.04	3124265
Total Xylenes	ug/g	ND	ND	0.67	ND	ND	0.04	3124265
F1 (C6-C10)	ug/g	ND	ND	ND	ND	ND	10	3124265
F1 (C6-C10) - BTEX	ug/g	ND	ND	ND	ND	ND	10	3124265
<b>F2-F4 Hydrocarbons</b>								
F2 (C10-C16 Hydrocarbons)	ug/g	ND	ND	ND	ND	ND	10	3124084
F3 (C16-C34 Hydrocarbons)	ug/g	ND	ND	39	ND	ND	10	3124084
F4 (C34-C50 Hydrocarbons)	ug/g	ND	ND	21	ND	ND	10	3124084
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes	Yes		3124084
<b>Surrogate Recovery (%)</b>								
1,4-Difluorobenzene	%	99	100	100	100	100		3124265
4-Bromofluorobenzene	%	104	105	104	103	105		3124265
D10-Ethylbenzene	%	91	87	90	83	93		3124265
D4-1,2-Dichloroethane	%	100	100	100	99	98		3124265
o-Terphenyl	%	104	106	108	113	111		3124084

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

Maxxam Job #: B322399  
Report Date: 2013/02/15

Dillon Consulting Limited  
Client Project #: 12-7092  
Site Location: SHEDIAC

**GENERAL COMMENTS**

**Results relate only to the items tested.**



Dillon Consulting Limited  
Attention: Michelle Degarie  
Client Project #: 12-7092  
P.O. #:  
Site Location: SHEDIAC

Quality Assurance Report  
Maxxam Job Number: MB322399

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3123866 CYN	RPD [QO1061-01]	Moisture	2013/02/14	1.5		%	20
3124084 ZZ	Matrix Spike	o-Terphenyl	2013/02/14		100	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2013/02/14		88	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2013/02/14		92	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2013/02/14		98	%	50 - 130
	Spiked Blank	o-Terphenyl	2013/02/14		100	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2013/02/14		86	%	80 - 120
		F3 (C16-C34 Hydrocarbons)	2013/02/14		91	%	80 - 120
		F4 (C34-C50 Hydrocarbons)	2013/02/14		96	%	80 - 120
	Method Blank	o-Terphenyl	2013/02/14		104	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2013/02/14	ND, RDL=10		ug/g	
		F3 (C16-C34 Hydrocarbons)	2013/02/14	ND, RDL=10		ug/g	
		F4 (C34-C50 Hydrocarbons)	2013/02/14	ND, RDL=10		ug/g	
	RPD	F2 (C10-C16 Hydrocarbons)	2013/02/14	NC		%	30
		F3 (C16-C34 Hydrocarbons)	2013/02/14	NC		%	30
		F4 (C34-C50 Hydrocarbons)	2013/02/14	NC		%	30
3124265 LRA	Matrix Spike [QO1061-01]	1,4-Difluorobenzene	2013/02/15		101	%	60 - 140
		4-Bromofluorobenzene	2013/02/15		103	%	60 - 140
		D10-Ethylbenzene	2013/02/15		89	%	60 - 140
		D4-1,2-Dichloroethane	2013/02/15		98	%	60 - 140
		Benzene	2013/02/15		99	%	60 - 140
		Toluene	2013/02/15		93	%	60 - 140
		Ethylbenzene	2013/02/15		93	%	60 - 140
		o-Xylene	2013/02/15		89	%	60 - 140
		p+m-Xylene	2013/02/15		82	%	60 - 140
		F1 (C6-C10)	2013/02/15		102	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene	2013/02/15		100	%	60 - 140
		4-Bromofluorobenzene	2013/02/15		105	%	60 - 140
		D10-Ethylbenzene	2013/02/15		92	%	60 - 140
		D4-1,2-Dichloroethane	2013/02/15		99	%	60 - 140
		Benzene	2013/02/15		106	%	60 - 130
		Toluene	2013/02/15		100	%	60 - 130
		Ethylbenzene	2013/02/15		99	%	60 - 130
		o-Xylene	2013/02/15		95	%	60 - 130
		p+m-Xylene	2013/02/15		87	%	60 - 130
		F1 (C6-C10)	2013/02/15		106	%	80 - 120
	Method Blank	1,4-Difluorobenzene	2013/02/15		98	%	60 - 140
		4-Bromofluorobenzene	2013/02/15		105	%	60 - 140
		D10-Ethylbenzene	2013/02/15		90	%	60 - 140
		D4-1,2-Dichloroethane	2013/02/15		99	%	60 - 140
		Benzene	2013/02/15	ND, RDL=0.005		ug/g	
		Toluene	2013/02/15	ND, RDL=0.02		ug/g	
		Ethylbenzene	2013/02/15	ND, RDL=0.01		ug/g	
		o-Xylene	2013/02/15	ND, RDL=0.02		ug/g	
		p+m-Xylene	2013/02/15	ND, RDL=0.04		ug/g	
		Total Xylenes	2013/02/15	ND, RDL=0.04		ug/g	
		F1 (C6-C10)	2013/02/15	ND, RDL=10		ug/g	
		F1 (C6-C10) - BTEX	2013/02/15	ND, RDL=10		ug/g	
	RPD [QO1061-01]	Benzene	2013/02/15	NC		%	50
		Toluene	2013/02/15	NC		%	50
		Ethylbenzene	2013/02/15	NC		%	50
		o-Xylene	2013/02/15	NC		%	50
		p+m-Xylene	2013/02/15	NC		%	50
		Total Xylenes	2013/02/15	NC		%	50

Dillon Consulting Limited  
 Attention: Michelle Degarie  
 Client Project #: 12-7092  
 P.O. #:  
 Site Location: SHEDIAC

### Quality Assurance Report (Continued)

Maxxam Job Number: MB322399

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3124265 LRA	RPD [QO1061-01]	F1 (C6-C10)	2013/02/15	NC		%	50
		F1 (C6-C10) - BTEX	2013/02/15	NC		%	50

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

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 (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.

## Validation Signature Page

**Maxxam Job #: B322399**

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



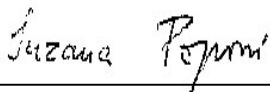

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Cristina Carriere, Scientific Services




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Jeevaraj Jeevaratnam, Senior Analyst




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Suzana Popovic, Supervisor, Hydrocarbons

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