

Report No. 2499-01-01

**EXHAUSTIVE ENVIRONMENTAL
CHARACTERIZATION OF SOILS**

**Québec City Armoury
Québec (Québec)**

Lot 1 315 203 of the *Cadastre du Québec*

ARCOP/DFS/STGM Consortium of Architects

**File No. 2499-01
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BTEX:	Benzene, toluene, ethylbenzene and xylene
CLMS:	Contaminated land management system
CSST:	Commission de la santé et de la sécurité du travail du Québec
EQA:	Environment Quality Act
HIS:	Hydrogeological information system
LPRR:	Land Protection and Rehabilitation Regulation
MAH:	Monocyclic aromatic hydrocarbon
MDDELCC:	Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques
MRN:	Ministère des Ressources naturelles
PAH:	Polycyclic aromatic hydrocarbon
PCB:	Polychlorinated biphenyl
PH C ₁₀ -C ₅₀ :	Petroleum hydrocarbon C ₁₀ -C ₅₀
RBQ:	Régie du bâtiment du Québec
RSWIS:	Resurgence in surface water or infiltration into sewers
UFFI:	Urea-formaldehyde foam insulation
VOC:	Volatile organic compound



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1.0 INTRODUCTION

A team of geotechnical, environmental and soils and materials engineering consultants from Laboratoires d'Expertises de Québec ltée (hereinafter "L.E.Q. ltée") was contracted by the ARCOP/DFS/STGM consortium of architects to conduct an exhaustive environmental characterization of soils on the property of the Québec City Armoury, located at 805 Avenue Wilfrid-Laurier, in Québec City.

This report includes all of the results of the work carried out as well as the resulting comments, recommendations and conclusions. This report was prepared specifically for the exclusive use of the ARCOP/DFS/STGM consortium and Public Works and Government Services Canada (hereinafter "PWGSC") as part of the Québec City Armoury reconstruction project. With the exception of the Department of National Defence and its business partners, including other professionals involved with the project's completion, as applicable, no other person, body or entity may use this report without the written consent of L.E.Q. ltée, a representative of the Department of National Defence, a representative of the ARCOP/DFS/STGM consortium and a representative of PWGSC.

1.1 Context and purpose of the study

This study was conducted further to the *Étude Géotechnique et de Caractérisation environnementale de site - Phases I & II* (geotechnical study and environmental characterization – phases I & II – in French only) conducted on the Québec City Armoury site by the firm SNC-Lavalin Environnement Inc. in November 2009 (reference No. 606391). As part of that study, all soil samples analyzed revealed concentrations below level "B" of the generic criteria of the *Politique de protection des sols et de réhabilitation des terrains contaminés* (policy on soil protection and the remediation of contaminated land - in French only, hereinafter



“the Policy”) of the Ministère du Développement durable, de l’Environnement et de la Lutte contre les changements climatiques (hereinafter “MDDELCC”), as well as the commercial criterion of the Canadian Council of Ministers of the Environment (hereinafter “CCME”) for the parameters that were the subject of analysis, namely, PAHs, HP C₁₀-C₅₀ and heavy metals.

The purpose of this exhaustive environmental characterization of soils is to investigate the environmental quality of the soils on site in order to provide guidelines to PWGSC concerning its off-site management of these materials. The evaluation of the environmental quality of the soils on the site was conducted in accordance with the MDDELCC’s Policy and CCME criteria.

2.0 SUMMARY DESCRIPTION OF THE SITE

The property under study is located at 805 Avenue Wilfrid-Hamel, in Québec City, and corresponds to Lot No. 1 315 203 of the *Cadastré du Québec*. The site is irregular in shape and covers an area of approximately 13,135 square metres. Its geographic coordinates are 46° 48' 41" north latitude and 71° 12' 80" west longitude (MTM/NAD 83). The Department of National Defence owns the site.

Topography is relatively flat and altitude is approximately 90 metres above the level of the Saint-Lawrence River. The site is essentially at the same level as the adjacent northeastern property and Avenue Wilfrid-Laurier, but above the level of the Plains of Abraham to the south. There are no bodies of water on the property. This sector of the city of Québec is served by a water supply and sewage system, and municipal zoning of the site is designated by Code 11046Up, which authorizes “public”, “commercial” and “outdoor recreation” use.

The Armoury building runs adjacent to Avenue Wilfrid-Laurier and covers an area of approximately 4,800 square metres. Other than the land in front of the building, which is grass-covered, the rest of the land surface is essentially a paved parking lot. In addition to a few underground infrastructures located mainly on the southwest portion of the property, there may be an underground heating oil tank located in the Armoury’s inner courtyard in the northern section of the site. Information from the *Caractérisation environnementale de site - Phases I & II* (environmental characterization – phases I & II – in French only) from 2009 indicates that an old heating oil tank with an approximate capacity of 10,000 litres may, in all likelihood, still be located on the site, given that no proof of it having been dismantled is available. The presumed location of the tank is indicated on Location Plan No. 2499-01-01 in Appendix “A”.



3.0 ENVIRONMENTAL CHARACTERIZATION OPERATIONS

The sounding program was prepared by Mr. Frédéric Lortie, engineer, who is in charge of environmental projects at L.E.Q. ltée, in collaboration with representatives of the client. To meet the objectives outlined above, the following work was carried out under the supervision of L.E.Q. ltée technical staff from May 23 to June 7, 2013 and from November 26 to December 5, 2013:

- Investigating the presence of underground public infrastructures (Vidéotron ltée, Bell Canada, Ville de Québec, Hydro-Québec Distribution, Gaz Métro, etc.) by the Info-Excavation service, Travaux publics de la ville de Québec and PWGSC;
- Drilling eight boreholes, identified as F-1 to F-8, to assess the environmental quality of the soils located inside the parade hall. Drilling was carried out from May 23 to 27, 2013;
- Setting up borehole F-6 as a groundwater observation pit, identified as PO-6. This work was carried out during the borehole drilling operations;
- Installing observation tubes in boreholes F-1 to F-5, F-7 and F-8 to measure groundwater levels. This work was also carried out during the borehole drilling operations;
- Setting up nine test pits, identified as PE-1 to PE-9, to assess the environmental quality of the soils located inside the parade hall and along the perimeter of the building's foundation walls. It should be noted, however, that the excavation work had been carried out prior to our arrival on the site. Samples were collected on June 6 and 7, 2013;

- Continuous soil sampling at five excavation zones previously carried out for the purposes of archeological exploration. In total, eight excavation walls, identified as PE-10 to PE-13, PE-16, PE-18, PE-19 and PE-23, were sampled to assess the environmental quality of the soils from the site's parking lot. Sampling was carried out on November 26 and December 4, 2013;
- Setting up eight test pits, identified as PE-14, PE-15, PE-17, PE-20 to PE-22 and PE-24, to assess the environmental quality of the soils from the site's parking lot. This work was carried out on November 26 as well as December 4 and 5, 2013;
- Continuous soil sampling from each sounding in accordance with the recommendations set forth by the MDDELCC;
- Measuring water levels and checking for the eventual presence of free-phase petroleum hydrocarbons in observation pit PO-6 and in the observation tubes left in boreholes F-1 to F-5, F-7 and F-8. This work was carried out on June 7, 2013;
- Applying a quality control program to the sample analysis results, including a field duplicate analyses of at least 10%;
- Delivering the soil samples to the Agat laboratory in Québec City for chemical analysis;
- Surveying of the borehole locations, test pits and archeological excavation areas.

All of the operations listed above were carried out in accordance with the recommendations set forth in the *Guide de caractérisation des terrains* (site characterization guide – in French only) published by the MDDELCC. Location Plans Nos. 2499-01-01 and -02 in Appendix “A” show the borehole locations and the Photographic Compendium in Appendix “B” provides the context in which these operations were carried out.

After the field work was completed, a chemical analysis of selected soil samples was conducted. Sample selection was based on organoleptic indicators as well as the geological and hydrogeological context of the site under study.

3.1 Archeological excavation and test pit walls

Sampling at test pits PE-1 to PE-9 was carried out by L.E.Q. ltée technical staff on June 6 and 7, 2013 to a depth that varied from 1.20 to 3.15 metres from the surface. It should again be noted that the excavation had already been carried out under the client’s responsibility before our arrival on the site.

Sampling at excavation walls PE-10 to PE-13, PE-16, PE-18, PE-19 and PE-23 was carried out by L.E.Q. ltée technical staff on November 26 and December 4, 2013 from five excavation pits that had already been dug, under the client’s responsibility, for the purposes of archeological exploration. Sampling was carried out to the bottom of each excavation pit, that is, to a depth of 1.00 to 3.80 metres from the surface.



Test pits PE-14, PE-15, PE-17, PE-20 to PE-22 and PE-24 were set up under the constant supervision of L.E.Q. Itée technical staff on November 26 as well as December 4 and 5, 2013 to a depth of 0.56 to 2.20 metres from the surface. Using a Caterpillar 308 E hydraulic excavator, the pits were created in accordance with operational objectives and based on site accessibility.

Soil samples were collected from one wall in each of the test pits and certain archeological pit walls. The procedure consisted of first removing the layer of soil that came into contact with the excavation equipment. Soil samples were then continuously collected at a maximum sampling interval of 1.00 metre. Samples were composed of five sub-samples.

For more information, test pit and archeological excavation pit wall stratigraphy is described in section 4.0, and further detailed in the sounding reports in Appendix “C”.

3.2 Boreholes

Boreholes F-1 to F-8 were drilled on May 23, 24 and 27, 2013 using a track-mounted EnviroTrack corer equipped with a hollow auger to a depth of 3.05 to 4.58 metres from the surface. For geotechnical considerations, which are covered in our report No. 4956-00-01 issued in July 2013, boreholes were drilled using NW-type tubing and washing.

A standardized 50.8-millimetre (outside diameter) split spoon was used to recover soil samples for the purposes of visual description and laboratory analysis. During the sampling operations, standard penetration trials were conducted in accordance with standard NQ 2501-140.

Observation tubes made from bottom-perforated 19-millimetre PVC pipes were inserted in boreholes F-1 to F-5, F-7 and F-8 in order to subsequently measure groundwater levels.

For more information, the stratigraphy of the borehole sites is described in section 4.0 and further detailed in the borehole reports in Appendix “C”.

3.3 Installation of the observation pit

Borehole F-6 was set up as a groundwater observation pit and identified as PO-6. The observation pit was set up with a perforated PVC screen casing 2.47 metres in length, 50 millimetres in diameter and with 0.25-millimetre slot openings. An unperforated PVC pipe of the same diameter was screwed onto this screen and installed so as to reach the land surface. In addition, the observation pit was fitted with a bottom plug. Clean Grade 1 silica sand was placed around the screen to act as permeable filter material. A 1.40-metre high bentonite sealing plug was fashioned from the upper contact of the filter mass to the surface to prevent any surface water from seeping into the pit. For more information, installation details are presented in the borehole F-6 report in Appendix “C”.

It should be noted that the observation pit was dry during the various readings taken between May 28 and June 7, 2013. These results indicate that the water table is deeper than 4.12 metres at that borehole site.

3.4 Soil sample collection

A strict management procedure in compliance with the *Guide d'échantillonnage à des fins d'analyses environnementales : Cahier 5 - Échantillonnage des sols* (sampling guide for environmental analysis - booklet 5 – soil sampling - in French only) from the MDDELCC was used during sample collection, identification, temporary storage and transportation so as to preserve their integrity until they were delivered to the analysis laboratory that was hired for the purposes of the contract.

Before any soil samples were collected, the instruments were first washed with a brush and soapy water, and then successively rinsed with demineralised water, acetone, hexane, acetone, and demineralised water.

All soil samples were carefully placed in brand new glass jars and sealed with airtight screw-on lids. As the jars were filled, care was taken to minimize contact with the atmosphere so as to avoid the loss of VOCs, as applicable.

The samples were clearly identified with the sounding number, sample number and sampling date. Table 1 below provides an explanation of the terms used in identifying the samples.

TABLE I
SAMPLE NOMENCLATURE

Abbreviation	Meaning
PE	Test pit
F	Borehole
PO	Groundwater observation pit
VR	Bulk sampling (collected manually)
CF	Sample collected using a split spoon
DUP	Duplicate or control sample

Samples were kept in a cooler at a temperature of approximately 4°C, then temporarily stored at a safe location. After the field work was completed, samples were delivered to our laboratory in Québec City where they were kept at a cool temperature ($\pm 4^{\circ}\text{C}$) in a refrigerator. Selected samples were then sent to the analysis laboratory that was hired to conduct the chemical analyses.



3.5 Surveying and levelling

For soundings F-1 to F-8 and PE-1 to PE-9 carried out in May and June 2013, the final location of the soundings was determined using on-site physical reference point measurements. Geodetic elevation of the land surface at the borehole site was measured by L.E.Q. Itée staff using an elevation benchmark identified as 23L1035 located on the front facade of the existing Armoury building, which indicated 90.87 metres of elevation.

As for soundings PE-10 to PE-24 carried out in November and December 2013, except for the location of test pits PE-21 and PE-24, X and Y plotting of all sounding locations was conducted using an Ashtech ProMark 200 dual-frequency network RKT rover. Since the building's close proximity to test pits PE-21 and PE-24 hindered the dual-frequency receiver's accuracy, the location of those test pits was determined by measuring the distance from the building.

The location of each sounding is presented in Location Plans Nos. 2499-01-01 and -02 in Appendix "A".

4.0 SOIL DESCRIPTION

This section summarizes the nature of the materials encountered during the fieldwork operations. For more information, the detailed stratigraphy for each sounding is presented in the borehole and test pit reports in Appendix “C”. It should be noted that all of the granulometric soil descriptions are based on a visual examination of the samples and that no laboratory analyses were carried out.

4.1 Asphalt

On the surface, a layer of asphalt approximately 100 millimetres thick was found at boreholes F-1 to F-8 and test pits PE-5, PE-7 and PE-9 to PE-24.

4.2 Concrete

Directly on the surface of soundings PE-6 and PE-8 and under the layer of asphalt at boreholes F-1 to F-8 and test pits PE-5, PE-7 and PE-21, a concrete slab was found with a thickness of 120 to 370 millimetres.

4.3 Granular fill

In general, under the layers described in sections 4.1 and 4.2, a layer of gray sandy gravel containing traces of silt with an average thickness of 0.20 metres rests on a layer of brown sand containing traces of silt with an average thickness of 0.35 metres.

At test pits PE-1 to PE-3, which were positioned between the Armoury building and Avenue Wilfrid-Laurier, brown sand fill containing traces of silt and gravel was found, with a thickness of 1.75 to 2.95 metres.

Small asphalt fragments were also found in a proportion of 2% to 10% in the layer of sandy gravel at test pits PE-14 to PE-17, PE-22 and PE-24. It should be noted that at sounding PE-16, brick and glass debris were also found in a proportion of less than 1%.

4.4 Excavated rock

Immediately beneath the layers of granular material described above, material appearing to be excavated rock composed of a mix of sand, silt and gravel in variable proportions were also found, with a thickness of 0.15 to 3.05 metres. These materials rested directly on the bedrock, which is described in section 4.5 below.

Residual materials were also observed in these soils at soundings F-3, PE-4 to PE-17 and PE-19 to PE-24. These residual materials were composed of brick, concrete, wood, ceramic, metal, mortar and glass debris as well as incineration residues, in a proportion of 1% to 30%, depending on the location. Furthermore, mild organoleptic indicators of contamination were perceived in the fill material found at boreholes F-2 to F-5.

4.5 Bedrock

The bedrock, generally composed of clayey limestone, was found at every borehole as well as test pits PE-5, PE-6 and PE-10 to PE-24 from a depth of 0.53 to 3.80 metres below the surface.

4.6 Groundwater

Observation tubes were placed in boreholes F-1 to F-5, F-7 and F-8 and an observation pit was placed in borehole F-6 to measure groundwater levels. However, given the low permeability of the bedrock and the use of water to bore into the rock, no accurate information can be drawn from water measurements performed in this study. The water levels measured probably reflect a buildup of drilling water in the boreholes. The underground water table is probably much deeper than what those measurements would indicate. New water level measurements taken once the layer of snow and/or ice on the site has melted would provide more accurate values. Measurements taken between May 23 and June 7, 2013 are presented in the borehole reports in Appendix “C”. No significant underground water seepage was observed during the test pit implementation operations.

5.0 LABORATORY CHEMICAL ANALYSES

5.1 Analysis Laboratory

All chemical analyses conducted as part of this contract were performed by the Agat laboratory in Québec City. This laboratory is recognized and certified by the MDDELCC. The analysis certificates are presented in Appendix “D”.

It should be noted that, as part of this contract, soil acid base accounting was performed by the firm Enviromine Inc. in Longueuil, Québec for the Agat laboratory. The analysis certificates from Enviromine Inc. are also presented in Appendix “D”.

5.2 Interpretive criteria

In order to provide the client with guidelines regarding off-site management of the excavation waste that will be generated during the project’s execution, the soil sample chemical analysis results were interpreted on the basis of the generic criteria set forth in the MDDELCC’s Policy. For this project, the background levels used for metals are those that apply to the Appalachian geological province.

In addition, given that the site under study is under federal jurisdiction, the soil sample chemical analysis results were also interpreted on the basis of CCME requirements. For the soil that remained on site, given the Armoury’s vocation, the CCME’s commercial criterion was determined as the threshold on the basis of which remediation efforts would be required.



5.3 Analysis parameters

Analysis parameters were selected by the client's representatives from the following:

- PH C₁₀-C₅₀;
- PAH;
- Metals (As, Ag, Ba, Cd, Co, Cr, Cu, Hg, Mn, Mb, Sn, Ni, Pb, Se and Zn);
- Total sulphur.

Sample selection was guided by the geological and hydrogeological context of the site as well as visual and olfactory observations by the site technician, which were subsequently validated by the L.E.Q. ltée project manager.

5.4 Laboratory chemical analysis methods

The analysis methods, limits of detectability of those methods and a summary of Agat's internal quality control program are presented in Appendix "D".



6.0 CHEMICAL ANALYSIS RESULTS

The following section presents the results of the soil sample analyses as well as the quality control applied to those results. The analysis certificates and tables detailing the chemical analysis results are presented in Appendix “D”.

6.1 Soil chemical analysis results

Tables II and III below indicate the environmental soil classification of the collected samples in accordance with MDDELCC and CCME requirements. Chemical analyses were performed on a total of forty-seven soil samples and seven duplicate samples.

TABLE II
SUMMARY OF THE CHEMICAL ANALYSIS RESULTS FOR THE SOIL
SAMPLES COLLECTED FROM THE SOUNDINGS INSIDE THE
PARADE HALL

Sounding	Sample	Depth (m)	Parameter analyzed			
			PH C ₁₀ -C ₅₀	PAH	Metals	Sulfur
F-1	4-CF	2.42 to 3.03	<A	<A <CCME	B-C ≥CCME	>C
	4-CF DUP	2.42 to 3.03	--	--	>C ≥CCME	--
F-2	1-CF	0.28 to 0.61	<A	A-B <CCME	<A <CCME	B-C
	3-CF	1.22 to 1.83	--	<A <CCME	--	--
F-3	3-CF	1.22 to 1.45	<A	--	B-C ≥CCME	--
F-4	2-CF	0.61 to 1.22	<A	--	B-C <CCME	--
F-5	2-CF	0.61 to 1.22	--	--	B-C ≥CCME	--
	4-CF	1.83 to 2.13	<A	<A <CCME	B-C ≥CCME	--
F-6	2-CF	0.61 to 1.22	--	--	B-C ≥CCME	--
	4-CF	1.83 to 2.44	<A	<A <CCME	B-C ≥CCME	--
F-7	3-CF	1.22 to 1.83	<A	<A <CCME	>C ≥CCME	--
PE-6	2-VR	0.75 to 1.60	<A	<A <CCME	<A <CCME	--
	3-VR	1.60 to 2.25	--	<A <CCME	B-C ≥CCME	--
PE-7	1-VR	0.35 to 1.35	--	B-C <CCME	B-C ≥CCME	--
PE-8	1-VR	0.20 to 0.70	--	B-C <CCME	A-B ≥CCME	--
	2-VR	0.70 to 1.55	--	B-C <CCME	>C ≥CCME	--

TABLE III

**SUMMARY OF THE CHEMICAL ANALYSIS RESULTS FOR CERTAIN
SOIL SAMPLES COLLECTED FROM THE SOUNDINGS OUTSIDE THE
PARADE HALL**

Sounding	Sample	Depth (m)	Parameter analyzed			
			PH C ₁₀ -C ₅₀	PAH	Metals	Sulfur
PE-1	2-VR	1.00 to 1.95	<A	<A <CCME	--	<A
PE-2	1-VR	0.10 to 1.00	<A	<A <CCME	<A <CCME	--
PE-3	3-VR	2.25 to 3.15	<A	<A <CCME	<A <CCME	--
PE-4	3-VR	1.10 to 2.10	<A	<u>A-B</u> <CCME	>C ≥CCME	--
	3-VR DUP	1.10 to 2.10	<A	--	--	--
PE-5	1-VR	0.22 to 0.50	B-C	<u>A-B</u> <CCME	B-C ≥CCME	--
	2-VR	0.50 to 1.20	--	<u>A-B</u> <CCME	>C ≥CCME	--
PE-9	3-VR	0.43 to 1.45	<A	B-C <CCME	>C ≥CCME	--
PE-9	3-VR DUP	0.43 to 1.45	<A	--	--	--
PE-10	3-VR	0.52 to 1.10	<A	<A <CCME	B-C ≥CCME	--
PE-11	2-VR	0.20 to 0.52	<A	<A <CCME	<A <CCME	--
	3-VR	0.52 to 1.10	<A	<u>A-B</u> <CCME	B-C <CCME	B-C
	3-VR DUP	0.52 to 1.10	<A	--	--	--
PE-12	2-VR	0.20 to 0.70	<A	<A <CCME	<A <CCME	--
	3-VR	0.70 to 1.30	<A	<A <CCME	>C ≥CCME	--
PE-13	1-VR	0.07 to 0.25	<A	<A <CCME	<A <CCME	--
	3-VR	0.60 to 1.00	--	<u>A-B</u> <CCME	B-C <CCME	--
PE-14	3-VR	0.50 to 1.00	--	<A <CCME	>C ≥CCME	--
PE-15	3-VR	0.45 to 0.90	--	<u>A-B</u> <CCME	<u>A-B</u> <CCME	--
	3-VR DUP	0.45 to 0.90	--	<u>A-B</u> <CCME	--	--

TABLE III (CONT'D)

**SUMMARY OF THE CHEMICAL ANALYSIS RESULTS FOR CERTAIN
SOIL SAMPLES COLLECTED FROM THE SOUNDINGS OUTSIDE THE
PARADE HALL**

Sounding	Sample	Depth (m)	Parameter analyzed			
			PH C ₁₀ -C ₅₀	PAH	Metals	Sulfur
PE-16	1-VR	0.07 to 0.15	<A	<A <CCME	A <CCME	--
	4-VR	0.80 to 1.50	<A	<u>A-B</u> <CCME	<u>B-C</u> ≥CCME	--
PE-17	3-VR	0.50 to 1.15	<A	<u>B-C</u> <CCME	<u>B-C</u> ≥CCME	--
PE-18	1-VR	0.10 to 0.40	--	<A <CCME	<A <CCME	--
PE-19	2-VR	0.50 to 1.00	--	<A <CCME	<A <CCME	--
	3-VR	1.00 to 2.00	<A	<u>B-C</u> <CCME	<u>B-C</u> ≥CCME	--
	3-VR DUP	1.00 to 2.00	--	--	<u>B-C</u> ≥CCME	--
PE-20	2-VR	0.43 to 1.35	--	<u>A-B</u> <CCME	<u>B-C</u> ≥CCME	<u>B-C</u>
PE-21	1-VR	0.38 to 0.56	<A	<u>A-B</u> <CCME	<u>B-C</u> ≥CCME	--
PE-22	2-VR	0.42 to 0.97	--	--	>C ≥CCME	--
	3-VR	0.97 to 1.37	<A	--	<A <CCME	--
	4-VR	1.37 to 2.20	--	<u>B-C</u> <CCME	<u>B-C</u> ≥CCME	--
PE-23	2-VR	0.32 to 0.75	--	<A <CCME	<u>A-B</u> <CCME	--
	3-VR	0.75 to 1.75	--	--	>C ≥CCME	--
	4-VR	1.75 to 2.75	--	<u>A-B</u> <CCME	--	--
	5-VR	2.75 to 3.80	--	--	>C ≥CCME	--
PE-24	2-VR	0.55 to 1.60	<A	<u>A-B</u> <CCME	<u>A-B</u> ≥CCME	--
	2-VR DUP	0.55 to 1.60	--	<u>A-B</u> <CCME	--	--

< A, A-B, B-C, > C:

CCME:

--:

Generic criteria ranges of the MDDELCC's Policy;

CCME commercial criterion;

Parameter not analyzed.

With regard to soil compliance with federal requirements, out of all the results of the chemical analyses performed, twenty-seven samples revealed concentrations of metals above the CCME's commercial criterion. These soils do not meet the applicable requirements for the site under study.

As for the environmental quality of the soils with regard to provincial requirements, out of all the results of the chemical analyses performed, thirty-five samples revealed concentrations above criterion "A" of the Policy for the parameters analyzed. A detailed examination of the results of the soil analyses has revealed the following:

- Only one of the samples analyzed for PH C₁₀-C₅₀ revealed a concentration above criterion "A" of the Policy. A concentration in the "B-C" range was measured in sample PE-5 / 1-VR;
- With regard to PAHs, seven samples revealed concentrations in the "B-C" range and twelve samples revealed concentrations in the "A-B" range of the generic criteria of the MDDELCC's Policy;
- With regard to metals, eleven samples revealed concentrations above criterion "C", eighteen samples revealed concentrations in the "B-C" range and four samples revealed concentrations in the Policy's "A-B" range;
- Samples F-1 / 4-CF, F-2 / 1-CF, PE-11 / 3-VR and PE-20 / 2-VR, on which a sulfur analysis was performed, all revealed concentrations above the "B" range for this parameter. Soil acid base accounting tests were performed on samples F-1 / 4-CF, F-2 / 1-CF and PE-11 / 3-VR. These tests revealed that the soils were not acid-forming. The presence

of non-acid forming soils is non-restrictive where only sulfur exceeds the usage criterion.

It should be noted that there are no CCME criteria for PH C₁₀-C₅₀ and sulfur. Detailed tables of chemical analysis results and the analysis certificates are presented in Appendix “D”.

6.2 Quality control assurance program

The Agat analysis laboratory abides by a strict internal quality control protocol so as to ensure compliance of the analysis methods and the credibility of the results. This protocol includes the use of duplicate samples, calibration benches and fortified samples. This information is available on each of the analysis certificates presented in Appendix “D”.

In addition to the quality control procedures used by the analysis laboratory, L.E.Q. ltée also collected seven duplicate soil samples and sent them for analysis to control for the chemical analyses presented. Quality control is carried out by evaluating the difference between the results using the following formula:

$$\text{Diff. (\%)} = \frac{(C1-C2)}{((C1+C2)/2)} \times 100$$

According to a review of literature presented at the 2006 forum of the *Association des consultants et laboratoires experts* (ACLE – association of consultants and expert laboratories), a difference of less than 100% is therefore acceptable for the soils on site.

Table IV below presents the results.

TABLE IV
RESULT VALIDITY CONTROL

Sample	Duplicate	Collection date	Parameter analyzed	Concentrations (ppm)		Difference (%)
				Sample	Duplicate	
F-1 / 4-CF	F-1 / 4-CF DUP	2013-05-23	Arsenic	40	45	12
			Cadmium	<0.9	<0.9	0
			Chromium	<45	<45	0
			Copper	<40	<40	0
			Tin	6	9	40
			Mercury	<0.2	<0.2	0
			Nickel	46	53	14
			Lead	<30	<30	0
			Zinc	100	<100	0
PE-4 / 3-VR	PE-4 / 3-VR DUP	2013-06-06	PH C ₁₀ C ₅₀	<100	<100	0
PE-9 / 3-VR	PE-9 / 3-VR DUP	2013-06-06	PH C ₁₀ C ₅₀	136	233	53
PE-11 / 3-VR	PE-11 / 3-VR DUP	2013-11-26	PH C ₁₀ -C ₅₀	125	149	18
PE-15 / 3-VR	PE-15 / 3-VR DUP	2013-11-26	Benzo(e)pyrene	0.1	0.1	0
			Benzo-(b+j+k)fluoranthene	0.2	0.1	67
			Benzo(g,h,i)perylene	0.1	0.1	0
			Chrysene	0.1	<0.1	0
			Fluoranthene	0.1	<0.1	0
			Pyrene	0.1	<0.1	0
			All other PAHs	<0.1	<0.1	0

TABLE IV (CONT'D)
RESULT VALIDITY CONTROL

Sample	Duplicate	Collection date	Parameter analyzed	Concentrations (ppm)		Difference (%)
				Sample	Duplicate	
PE-19 / 3-VR	PE-19 / 3-VR DUP	2013-12-04	Arsenic	23	23	0
			Cadmium	<0.9	<0.9	0
			Chromium	<45	<45	0
			Copper	43	42	2
			Tin	21	15	33
			Mercury	0.7	0.6	15
			Nickel	35	36	3
			Lead	154	128	18
			Zinc	136	132	3
PE-24 / 2-VR	PE-24 / 2-VR DUP	2013-12-05	Anthracene	0.1	0.1	0
			Benzo(a)anthracene	0.5	0.4	22
			Benzo(a)pyrene	0.5	0.4	22
			Benzo(b+j+k)fluoranthene	0.7	0.6	15
			Benzo(g,h,i)perylene	0.2	0.2	0
			Chrysene	0.5	0.4	22
			Fluoranthene	0.9	0.7	25
			Indeno(1,2,3-cd)pyrene	0.3	0.2	40
			Phenanthrene	0.5	0.3	50
			Pyrene	0.8	0.6	29
			All other PAHs	<0.1	<0.1	0

Based on the acceptability criteria described above, the concentrations measured in the samples and the duplicate samples are deemed acceptable. The detailed tables of the chemical analysis results and the analysis certificates are presented in Appendix “D”.

7.0 INTERPRETATION AND ESTIMATED VOLUMES OF CONTAMINATED SOILS

Interpretation of the scope of the contamination was carried out by taking into account the results of this exhaustive environmental characterization of soils. To evaluate the volumes of contaminated soil, several hypotheses needed to be put forward based on the following limitations, given that:

- the layer of contaminated soils is heterogeneous. Soil composition and level of contamination may therefore vary at any point;
- the thickness of the layer of contaminated soil may vary at any point;
- the soundings provide pin-pointed information that is not necessarily representative of an entire sector;
- the estimated contaminated soil volumes are merely an approximation determined for the sole purpose of providing guidance to the client with regards to budget planning.

Thus, the following hypotheses were put forward:

- The contamination (in reference to its nature and concentration level) measured in a given sounding extends to the halfway point between that sounding and a neighbouring sounding, or to the property boundary where no sounding is present. Polygon shapes were thus drawn around each sounding in which contamination was detected;



- Contamination thickness corresponds to the thickness of the layer represented by a contaminated sample and is consistent across the entire polygon.

It should be noted that this contaminated soil volume estimate applies exclusively to the soils located inside the parade hall and outside the current building. Although there is a strong likelihood that the building's foundations will rest on the bedrock, no verification of this fact was requested by the client.

Interpretation of the scope of the contamination using the polygon method must be carried out in consideration of all of the limitations and hypotheses listed above. Given that the contaminated soil volume estimate is based on both subjective and objective considerations, the degree of uncertainty is difficult to accurately determine. An initial approximation of this degree of uncertainty, however, based on the specific situations of each site, would suggest a range of 20% to 50% of the estimated volume.

The polygons drawn from the interpretation are presented in Drawings Nos. 2499-01-01 and -02 in Appendix "A". Based on the surface area covered by each of these polygons and the contaminated soil thickness estimates, approximate volumes were calculated and presented in Tables V to VII below:

TABLE V
ESTIMATED VOLUMES OF CONTAMINATED SOILS LOCATED
INSIDE THE PARADE HALL

Contaminated sounding	Level of contamination	Main contaminants	Polygon area (m ²)	Depth of contamination (m)	Thickness of contamination (m)	Calculated volume of contaminated soils (m ³)
F-1	B-C	PAHs and/or metals	216	0.40 to 1.81	1.41	305*
	>C ≥CCME	Metals		1.81 to 3.23	1.42	307
F-2	A-B	PAHs	409	0.28 to 1.93	1.65	675
F-3	B-C ≥CCME	Metals	251	0.39 to 1.45	1.06	266
F-4	B-C	Metals	354	0.37 to 1.22	0.85	301
	>C ≥CCME	Metals		1.22 to 2.44	1.22	432*
F-5	A-B	PAHs and/or metals	315	0.35 to 0.61	0.26	82*
	B-C ≥CCME	Metals		0.61 to 2.14	1.53	482
F-6	B-C ≥CCME	Metals and/or PAHs	101	0.37 to 2.44	2.07	209
F-7	A-B	Metals and/or PAHs	388	0.18 to 1.22	1.04	404*
	>C ≥CCME	Metals		1.22 to 2.08	0.86	334
F-8	A-B	Metals and/or PAHs	170	0.38 to 0.53	0.15	26*
PE-6	B-C ≥CCME	Metals	125	1.60 to 2.25	0.65	81
PE-7	B-C ≥CCME	PAHs and metals	94	0.35 to 2.30	1.95	183
		Metals and/or PAHs		2.30 to 2.80	0.50	47*
PE-8	B-C ≥CCME	PAHs	73	0.20 to 0.70	0.50	37
	>C ≥CCME	Metals		0.70 to 1.55	0.85	62

A-B, B-C, >C:
CCME:

Generic criteria ranges of the MDDELCC's Policy;
CCME commercial criterion;

*:

Drawn from an interpretation by L.E.Q. Itée even if no chemical analysis result was available.

TABLE VI
ESTIMATED VOLUMES OF CONTAMINATED SOILS LOCATED
OUTSIDE THE PARADE HALL

Contaminated sounding	Level of contamination	Main contaminants	Polygon area (m ²)	Depth of contamination (m)	Thickness of contamination (m)	Calculated volume of contaminated soils (m ³)
PE-4	>C ≥CCME	Metals	163.1	0.25 to 2.10	1.85	302
PE-5	B-C ≥CCME	PH C ₁₀ -C ₅₀ and metals	120.2	0.22 to 0.50	0.28	34
	>C ≥CCME	Metals		0.50 to 1.20	0.70	84
PE-9	>C ≥CCME	Metals	278.1	0.43 to 1.45	1.02	284
PE-10	B-C ≥CCME	Metals	508.7	0.52 to 1.10	0.58	295
PE-11	B-C	Metals	414.6	0.52 to 1.10	0.58	241
PE-12	>C ≥CCME	Metals	435.5	0.70 to 1.30	0.60	261
PE-13	B-C	Metals	579.1	0.60 to 1.00	0.40	232
PE-14	>C ≥CCME	Metals	490.7	0.50 to 1.00	0.50	245
PE-15	A-B	PAHs and metals	711.8	0.45 to 0.90	0.45	320
PE-16	B-C ≥CCME	Metals	626.4	0.37 to 1.50	1.13	708
PE-17	B-C ≥CCME	PAHs and metals	300.7	0.50 to 1.15	0.65	196
PE-18	B-C ≥CCME	PAHs and metals	341.3	0.70 to 1.40	0.70	239*
PE-19	B-C ≥CCME	PAHs and metals	332.9	1.00 to 2.00	1.00	333
PE-20	B-C ≥CCME	Metals	241.9	0.43 to 1.35	0.92	223
PE-21	B-C ≥CCME	Metals	144.6	0.38 to 0.56	0.18	26

TABLE VI (CONT'D)
ESTIMATED VOLUMES OF CONTAMINATED SOILS LOCATED
OUTSIDE THE PARADE HALL

Contaminated sounding	Level of contamination	Main contaminants	Polygon area (m ²)	Depth of contamination (m)	Thickness of contamination (m)	Calculated volume of contaminated soils (m ³)
PE-22	>C ≥CCME	Metals	234.6	0.42 to 0.97	0.55	129
	B-C ≥CCME	PAHs		0.97 to 2.20	1.23	289
PE-23	A-B	Metals	424.7	0.32 to 0.75	0.43	183
	>C ≥CCME	Metals		0.75 to 3.80	3.05	1,295
PE-24	A-B ≥CCME	PAHs and metals	181.4	0.55 to 1.60	1.05	191

A-B, B-C, >C:

Generic criteria ranges of the MDDELCC's Policy;

CCME:

CCME commercial criterion;

*:

Drawn from an interpretation by L.E.Q. Itée even if no chemical analysis result was available.

TABLE VII
CUMULATIVE ESTIMATED QUANTITIES OF CONTAMINATED SOIL

Level of contamination	Main contaminants	Estimated volume (m ³)		
		Inside the parade hall	Outside the building	Total
A-B	Metals and/or PAHs	1,187	694	1,881
B-C	Metals, PAHs and/or PH C ₁₀ -C ₅₀	1,911	2,816	4,727
>C	Metals	1,135	2,600	3,735
Total:		4,233 (of which 2,440 >CCME)	6,110 (of which 5,134 >CCME)	10,343 (of which 7,574 >CCME)

A-B, B-C, >C:

Generic criteria ranges of the MDDELCC's Policy;

CCME:

CCME commercial criterion.



Drawing No. 2499-01-01 in Appendix “A” illustrates the distribution of contamination interpreted on the basis of the generic criteria set forth in the MDDELCC’s Policy, whereas Drawing No. 2499-01-02, also in Appendix “A”, shows the distribution of contamination interpreted on the basis of the CCME’s commercial criterion.

8.0 DISCUSSION ON THE PROBABLE PRESENCE OF AN OLD UNDERGROUND TANK

As discussed in section 2.0, an old 10,000-litre underground heating oil tank may still be located in the Armoury's inner courtyard.

Including the environmental boreholes that were drilled as part of the *Caractérisation environnementale de site - Phases I & II* (environmental characterization – phases I & II – in French only) from 2009, a total of three soundings were performed in this sector, namely, boreholes F-09-06 and F-09-09 (SNC Lavalin) and test pit PE-5 (L.E.Q. ltée). The presumed location of the tank and the approximate location of boreholes F-09-06 and F-09-09 are indicated on Drawing No. 2499-01-01 in Appendix “A”.

In each of these three soundings, no petroleum hydrocarbons or olfactory indicators of contamination that would suggest the presence of a heating oil tank were detected in the soil and/or rock. It is important to note, however, that given the natural level of the bedrock in this sector of the site, it is very likely that the bottom of the tank rests in a pit excavated into the bedrock. Thus, since soundings F-09-09 and PE-5 ended on contact with the bedrock at a depth of approximately 1 metre beneath the surface, they cannot be used to confirm the environmental quality of the soil near the old tank. Borehole F-09-06, however, appears to have been drilled in closer proximity to the old tank. The bedrock was reached at a depth of three metres, and a 3-metre thick core sample was extracted. No contamination indicators were detected. However, although information from borehole F-09-06 is encouraging, we are of the opinion that it is insufficient to rule on the environmental quality of the soil located near the old tank.

9.0 CONCLUSIONS AND RECOMMENDATIONS

An exhaustive environmental characterization of soils was conducted from May to December 2013 on the property of the Québec City Armoury, located at 805 Avenue Wilfrid-Laurier, in Québec City.

The general objective of this study was to determine the level of contamination of the soils on the site in order to provide PWGSC with guidelines regarding the off-site management of these materials. The environmental quality of the soils on this site was evaluated on the basis of the MDDELCC's Policy and CCME criteria.

The work essentially consisted of drilling eight boreholes (identified as F-1 to F-8) and twenty-four test pits (identified as PE-1 to PE-24). Representative soil samples were collected as the soundings were created. A chemical analysis was then performed on selected samples.

With regard to the soils' environmental compliance with federal requirements, out of all of the chemical analysis results obtained from each soil sample, twenty-seven samples revealed concentrations of metals above the CCME's commercial criterion. These soils do not meet applicable requirements for the site under study.

As for the environmental quality of the soils in terms of provincial requirements, thirty-five samples revealed concentrations of PH C₁₀-C₅₀, PAHs and/or metals above level "A" of the MDDELCC Policy's generic criteria. Five samples revealed "A-B"-level concentrations, nineteen samples revealed "B-C"-level concentrations and eleven samples revealed concentrations above the Policy's "C" criterion.

Recommendations

In light of the results, environmental remediation of the contaminated soil will be required on this property to meet the CCME commercial criterion.

Furthermore, all soils that are contaminated beyond criterion “A” of the MDDELCC Policy must be managed, as they are excavated during the project’s execution, in accordance with the Policy’s *Grille de gestion des sols contaminés excavés intérimaire* (interim contaminated excavated soil management schedule – in French only) as well as the *Regulation respecting contaminated soil storage and contaminated soil transfer stations*. The *Grille de gestion des sols contaminés excavés intérimaire* is presented in Appendix “E” (in French only).

According to an estimate based on the results of chemical analyses conducted for the purposes of this study, the following amounts of contaminated material for the site under study are to be expected:

- Approximately 1,881 cubic metres of soils contaminated by metals and/or PAHs in the Policy’s “A-B” range;
- Approximately 4,727 cubic metres of soils contaminated by metals, PH C₁₀-C₅₀ and/or PAHs in the Policy’s “B-C” range;
- Approximately 3,735 cubic metres of soils contaminated by metals beyond criterion “C” of the Policy’s generic criteria.

It should also be noted that among the soil quantities listed above, 7,574 cubic metres of soil would also be contaminated by metals beyond the CCME commercial criterion.

Drawing No. 2499-01-01 in Appendix “A” indicates the distribution of contamination interpreted on the basis of the MDDELCC Policy’s generic criteria, whereas Drawing No. 2499-01-02, also in Appendix “A”, indicates the distribution of contamination interpreted on the basis of the CMME commercial criterion.

It should also be noted that the fill materials characterized at the sounding sites revealed a proportion of residual materials of 0% to 30%, depending on location, mainly composed of brick, concrete, wood, ceramic, metal, mortar, glass and/or incineration residues. Based on the size of the debris and rock fragments found in the fill material, we are of the opinion that sieving operations to remove the residual materials cannot be considered. In addition, given the types of contaminants found, these soils should be relocated to a landfill site authorized by the MDDELCC.

With regard to the underground tank located in the Armoury’s inner courtyard, given that the environmental sounding tests have not confirmed that this tank has not had any impact on the site’s environmental quality, an environmental characterization is recommended during the tank search efforts that will be conducted as part of the Armoury reconstruction work. If the tank is still there, it will have to be dismantled. According to federal regulations, this work will have to be carried out by a contractor specialized in petroleum equipment and supervised by an accredited specialist recognized by the Régie du bâtiment du Québec. The complete requirements are presented in the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations, SOR/2008-197* of Canada.



Lastly, it should be restated that the contaminated soil volume estimates presented in this report are only applicable to the soils located inside the parade hall and outside the current building. Although it is very likely that the building's foundations rest on the bedrock, no verification of that fact was requested by the client.



10.0 LIMITING CONDITIONS

This report is exclusively intended for the client for whom it was prepared. The information contained herein is provided to the best of our knowledge and in light of the data available to L.E.Q. ltée at the time it was drafted. This report must be considered as a whole and no individual portions may be used separately. Any use of this report by a third party, or any decision made by a third party on the basis of the content of this report, is the responsibility of that third party.

Any sketches or drawings that appear in or are attached to this report, as well as any statements that specify dimensions, capacities, quantities or distances are approximate and are solely provided to help the reader visualize the property.

In addition, it is important to mention that an environmental characterization study consists of spot sampling of a given site. As a result, the environmental, geological, hydrogeological and/or geotechnical conditions between sampling points may differ from the actual conditions revealed by the soundings, which provided the conditions on the basis of which our remarks and information were issued. The sample analysis results are only representative of the specific location and depth of the sampling site, the rest being the result of reasonable extrapolation. In addition, the time factor must be considered, as from moment the soundings are carried out, conditions may change as a result of a spill, natural events or direct or indirect human intervention on or at some distance from the site.

In light of the above, it is important to mention that the contents of this report and its conclusions are only applicable to the period of time that precedes the release date of this report. Any opinions concerning laws and/or regulations are presented herein for technical purposes and must not be interpreted as legal advice.



11.0 QUALIFICATIONS

The work was supervised by Mr. Frédéric Lortie, engineer, who is in charge of environmental projects at L.E.Q. Itée. Mr. Lortie has held a civil engineering degree since graduating in April 2009 and has worked in this field since 2007.

Mr. Lortie hereby certifies that the study was conducted with full impartiality and independence and with no interference on the part of L.E.Q. Itée management or its clients.

In addition, throughout the entire duration of this study, Mr. Lortie was aware of no conflicts of interest with regard to this property.



We remain available to provide any additional information.

LABORATOIRES D'EXPERTISES DE QUÉBEC LTÉE

Frédéric Lortie, Eng.

#OIQ: 5017965

Project Manager - Environment

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President

FL/LC/mm

Québec City, November 28, 2014

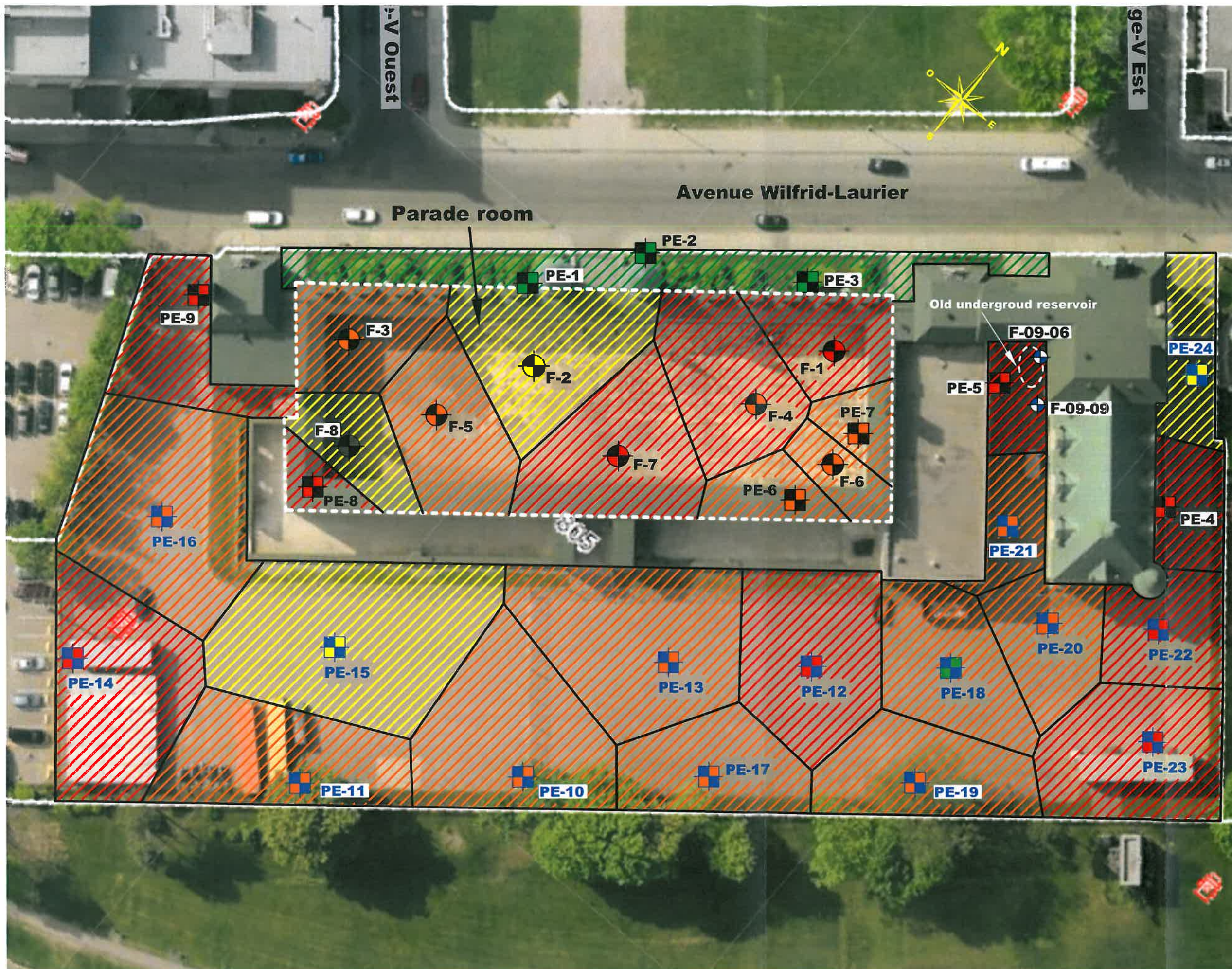
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APPENDIX “A”

Location of Soundings and Distribution of Contamination
Drawings Nos. 2499-01-01 and -02



Legend:



Parade room



Test pits carried out in
November and December 2013



Test pits carried out in
June 2013



Boreholes drilled in May 2013



Boreholes drilled in 2009
(approximate location)

Soil contamination ranges



Prepared for:

ARCOP/DFS/STGM Consortium

Prepared by:



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Géotechnique, environnement
et ingénierie des sols et matériaux

Seal:



Project Title:

Exhaustive Environmental
Characterization of Soils,
Québec City Armoury
Québec (Québec)

Drawing Title:

Sounding Locations and Soil Contamination
Distribution with Respect to the MDDELCC's
"Policy"

Drawing:
D.S. / F.L.

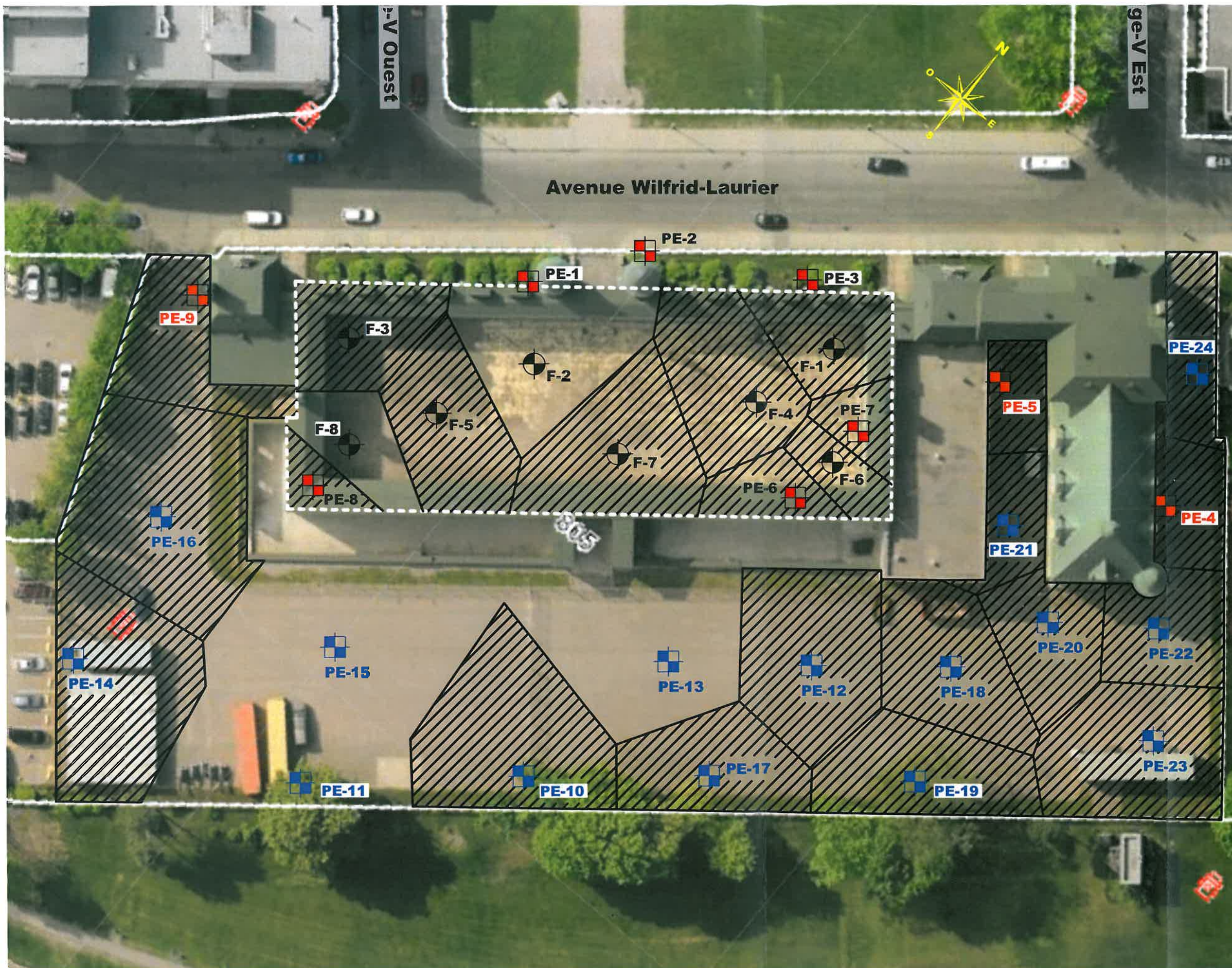
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Project No.:
2499-01

Verified:
L.C. / F.L.

Date:
November 2014

Drawing No.:
2499-01-01



Legend:



Parade room



Test pits carried out in
November and December 2013



Test pit carried out in
June 2013



Borehole drilled in May 2013

Soil Contamination Range



Prepared for:

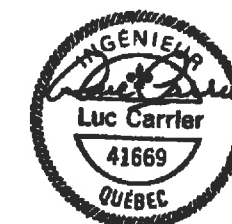
ARCOP/DFS/STGM Consortium

Prepared by:



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Géotechnique, environnement
et ingénierie des sols et matériaux

Seal:



Project Title:

Exhaustive Environmental
Characterization of Soils,
Québec City Armoury
Québec (Québec)

Drawing Title:

Sounding Locations and Soil Contamination
Distribution with Respect to the CCME's
Criterion

Drawing:
D.S. / F.L.

Scale:
1:500

Project No.:
2499-01

Verified:
L.C. / F.L.

Date:
November 2014

Drawing No.:
2499-01-02

APPENDIX “B”
Photographic Compendium
Pictures Nos. 1 to 8

Photographic Compendium



Picture 1 : Drilling of Borehole F-8. (2013-05-24)



Picture 2 : Test Pit PE-6. (2013-06-06)

Photographic Compendium



Picture 3 : Test Pit PE-8. (2013-06-07)



Picture 4 : Test Pit PE-7. (2013-06-07)

Photographic Compendium



Picture 5 : The beginning of an archaeological excavation. (PE-16).
Picture taken facing South. (2013-11-26)



Picture 6 : Face PE-19 of an archaeological excavation. (2013-12-05)

Photographic compendium



Picture 7 : Test Pit PE-20. (2013-12-05)



Picture 8 : Test Pit PE-24. (2013-12-05)

APPENDIX “C”

Borehole Reports

F-1 to F-8

Test Pit Reports

PE-1 to PE-24



GENERAL

EXPLANATION OF THE BOREHOLE RECORD FORM

FV-1003 (2011-05)

The object of the Borehole Record is to assemble all the field and laboratory data regarding the soil, bedrock and ground water conditions obtained during the investigation at each borehole.

PROFILE

Elevation: This column gives the elevation of boundaries between various geological strata. The elevation refers to the datum given in the general heading.

Description: Each geological stratum is described using the standard classification given below.

The proportion of each constituent part of the soil as defined by the grain size range is denoted by the terms given below. The compactness of granular soils is defined by the Standard Penetration Value and the consistency of cohesive soils by the shear strength.

Classification	Particle sizes
Clay	smaller than 0.002 mm
Silt	0.002 to 0.08 mm
Sand	0.08 to 5.00 mm
Gravel	5.00 to 80 mm
Cobbles	80 to 300 mm
Boulders	larger than 300 mm

Descriptive terms	Proportion
"trace"	1 to 10%
"some"	10 to 20%
Adjective (e.g. gravelly, silty)	20 to 35%
"and" (e.g. sand and gravel)	35 to 50%

Compactness	Standard Penetration Test "N" Value (blows per 0.3 m)
Very loose	0 to 4
Loose	4 to 10
Medium or compact	10 to 30
Dense	30 to 50
Very dense	over 50

Consistency	Shear strength (kPa)
Very soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very stiff	100 to 200
Hard	over 200

Degree of plasticity	Liquid limit
Low	less than 30%
Medium	between 30 and 50%
High	more than 50%

Stratigraphy: In this column the hatching symbols follow the symbols of the United Soil Classification System. The basic soil types are designated by the following symbols:

	Clay		Sand		Cobbles and/or boulders
	Silt		Gravel		Organic soil

GROUND WATER

The depth to ground water level as measured in the borehole is given in this column. The observation dates are given in the graph column at the right.

SAMPLES

Condition: The location, length and condition of each sample is shown in this column. The sample condition is defined by the symbols in the general heading.

Number & type: Each sample of the borehole is designated by the number as shown in this column. The sample type is also shown by a symbol that refers to the legend given in the general heading.

Recovery: Soil sample and rock core recoveries are given in percent of the penetration of the sampler. The sample length is equal to the distance from the top of the sample to the cutting edge irrespective of whether the lower part of the sample is lost.

R.Q.D.: The Rock Quality Designation is obtained by summing up the total length of core recovered but counting only those pieces of core which are 10 cm in length or longer, given in per cent of the core run.

$$R.Q.D. = \frac{\sum li \geq 10 \text{ cm}}{Lcr}$$

TESTS

Laboratory tests and results of *in-situ* tests are shown in this column at their corresponding depths.

Standard Penetration Test Values, commonly designated as "N" values, are given in this column. This value is obtained by dropping a 63.5 kg hammer onto the drill rods from a height of 760 mm. The number of blows necessary to produce the penetration of the last 305 mm of the 51 mm standard split spoon sampler is regarded as the "N" value.

GRAPH

Any pertinent observations noted during drilling and in the laboratory are given in the column. Also shown graphically are the results of Atterberg limits and moisture content tests as well as those of the 51 mm cone dynamic penetration test when performed. This latter penetration test consists in the continuous driving of a 51 mm diameter 60 degrees cone under constant energy, generally 475 joules, and thus differs from the Standard Penetration Test.

BOREHOLE LOG

Number: 4956-00

Hole #: F-1

Elevation: 90,34 m

Date: 2013-05-23

Project: Reconstruction of the Québec City Armoury

Location: Québec (Québec)

[illegible]



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BOREHOLE LOG

Number: 4956-00

Hole #: F-2

Elevation: 90,34 m

Date: 2013-05-23

Project: Reconstruction of the Québec City Armoury

Location: Québec (Québec)

Equipment used: Envirotrack

Casing si NW

Hammer weight: 63,5 kg

Drop: 760 mm

Sample condition

Disturbed

Good

Lost



Sample type

CF Split spoon sampler

CR Diamond core

LA Wash sample

TA Auger sample

TM Thin-wall sampler

PS Fixed piston sampler

Symbols



Groundwater level

Ach Chemical analysis

Ag Grain size analysis (sieving)

Sed Grain size analysis (sedimentation)

Wc Natural water content

Wl Liquid limit

Wp Plastic limit

Hydrocarbures

Odour

No non-existent

Li Light

Mo Moderate

Pe persistent

Visual aspect

No non-existent

Sc scattered

Sat Saturated

Profile			Str	Ground water	Samples			Tests	Odour	visual Aspect	Notes
Depth (m)	Elev (m)	Description			Cond	No et type	Rec (%)				
	90,34										
	90,31	Asphalt.									An open 19 mm diameter tube was left in the borehole to determine groundwater level. <div>Date<div>2013-05-24</div><div>2013-05-27</div><div>2013-06-07</div></div> <div>Depth (m)<div>1,77</div><div>2,31</div><div>2,51</div></div>
	90,06	(0.03 m)									
		Concrete.									
		(0.28 m)									
		Fill: Gray gravel, some sand, trace of silt to silty. Compact.									
1	89,12	(1.22 m)									
		Fill: Grayish-brown sandy gravel, trace to some silt. Presence of rock fragments.									
	88,41	(1.93 m)									
2		Bedrock: Gray clayey limestone. Presence of calcite veinlets. Ill-defined stratification dip. Fair to excellent quality.									



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BOREHOLE LOG

Number: 4956-00

Hole #: F-3

Elevation: 90,35 m

Date: 2013-05-24

Project: Reconstruction of the Québec City Armoury

Location: Québec (Québec)

Equipment used: Envirotrack

Casing si NW

Hammer weight: 63,5 kg

Drop: 760 mm

Sample type

CF Split spoon sampler
CR Diamond core
LA Wash sample
TA Auger sample
TM Thin-wall sampler
PS Fixed piston sampler

Symbols

▽ Groundwater level
Ach Chemical analysis
Ag Grain size analysis (sieving)
Sed Grain size analysis (sedimentation)
Wc Natural water content
Wl Liquid limit
Wp Plastic limit

Hydrocarbures

Odour
No non-existent
Li Light
Mo Moderate
Pe persistent
Visual aspect
No non-existent
Sc scattered
Sat Saturated

Sample condition

Disturbed Good Lost



Profile

Depth (m)	Elev (m)	Description
	90,35	
	90,32	Asphalt. (0.03 m)
	89,96	Concrete. (0.39 m)
		Fill: Brownish-gray silt, some gravel and sand, trace of silt. Very loose.
1	89,13	(1.22 m)
	88,90	Fill: Gray gravel and sand, trace of silt. Presence of concrete debris (15%). (1.45 m)
2		Bedrock: Gray clayey limestone. Presence of a layer of shale at a depth of approximately 2 metres. Presence of calcite veinlets. 50° stratification dip. Very poor to fair quality.
3	87,30	(3.05 m)
		End of drilling.
4		

Str

Ground water

Samples

Cond No et Rec (%)

Tests

Odour

Visual Aspect

Notes

An open 19 mm diameter tube was left in the borehole to determine groundwater level.

Date	Depth (m)
2013-05-27	1,34
2013-06-07	1,52



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BOREHOLE LOG

Number: 4956-00

Hole #: F-4

Elevation: 90,33 m

Date: 2013-05-23

Project: Reconstruction of the Québec City Armoury

Location: Québec (Québec)

Equipment used: Envirotrack		Sample type		Symbols		Hydrocarbures	
Casing si NW		CF	Split spoon sampler	▽	Groundwater level	Odour	
Hammer weight: 63,5 kg		CR	Diamond core	Ach	Chemical analysis	No	non-existent
Drop: 760 mm		LA	Wash sample	Ag	Grain size analysis (sieving)	Li	Light
Sample condition		TA	Auger sample	Sed	Grain size analysis (sedimentation)	Mo	Moderate
Disturbed	Good	TM	Thin-wall sampler	Wc	Natural water content	Pe	persistent
		PS	Fixed piston sampler	Wl	Liquid limit	Visual aspect	
				Wp	Plastic limit	No	non-existent
						Sc	scattered
						Sat	Saturated

Profile			Str	Ground water	Samples			Tests	Odour	Visual Aspect	Notes
Depth (m)	Elev (m)	Description			Cond	No et type	Rec (%)				
	90,33										
	90,30	Asphalt. (0.03 m)									
	89,96	Concrete. (0.37 m)									
		Fill: Gray gravel, some sand. Presence of rock fragments.									
1											
	89,11	(1.22 m)									
		Fill: Brown gravelly silt, some sand, trace of clay. Presence of rock fragments. Loose.									
2											
	87,89	(2.44 m)									
	87,66	Friable grey rock. (2.67 m)									
		Bedrock: Gray clayey limestone. Presence of a very fractured passage between 3.40 and 3.80 metres. 50° stratification dip. Very poor to fair quality.									
3											
4											
	85,75	(4.58 m)									
		End of drilling.									
5											

An open 19 mm diameter tube was left in the borehole to determine groundwater level.

Date	Depth (m)
2013-05-23	2,46
2013-05-27	3,34
2013-06-07	3,33

BOREHOLE LOG

Number: 4956-00

Hole #: F-5

Elevation: 90,35 m

Date: 2013-05-24

Project: Reconstruction of the Québec City Armoury

Location: Québec (Québec)

Equipment used: Envirotrack

Casing si NW

Hammer weight: 63,5 kg

Drop: 760 mm

Sample condition

Disturbed

Good

Lost



Sample type

CF Split spoon sampler

CR Diamond core

LA Wash sample

TA Auger sample

TM Thin-wall sampler

PS Fixed piston sampler

Symbols



 Groundwater level

Ach Chemical analysis

Ag Grain size analysis (sieving)

Sed Grain size analysis (sedimentation)

Wc Natural water content

W1 Liquid limit

W_p Plastic limit

Hydrocarbures

Odour

No non-existent

Li Light

Mo Moderate

Pe persistent

Visual aspect

No non-existent

Sc scattered

Sat Saturated

[illegible]



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BOREHOLE LOG

Number: 4956-00

Hole #: F-6

Elevation: 90,34 m

Date: 2013-05-27

Project: Reconstruction of the Québec City Armoury

Location: Québec (Québec)

Equipment used: Envirotrack

Casing si NW

Hammer weight: 63,5 kg

Drop: 760 mm

Sample type

CF Split spoon sampler
CR Diamond core
LA Wash sample
TA Auger sample
TM Thin-wall sampler
PS Fixed piston sampler

Symbols

Groundwater level
Ach Chemical analysis
Ag Grain size analysis (sieving)
Sed Grain size analysis (sedimentation)
Wc Natural water content
Wl Liquid limit
Wp Plastic limit

Hydrocarbures

Odour
No non-existent
Li Light
Mo Moderate
Pe persistent
Visual aspect
No non-existent
Sc scattered
Sat Saturated

Sample condition

Disturbed

Good

Lost



Profile			Str	Ground water	Samples			Tests	Odour	Visual Aspect	Notes
Depth (m)	Elev (m)	Description			Cond	No et type	Rec (%)				
	90,34										
	90,32	v									
		(0.02 m)									
	89,97	Concrete.									
		(0.37 m)									
		Fill: Gray gravel and silt, trace of clay. Presence of rock fragments. Loose.			1-CF		0		In	In	An open 19 mm diameter tube was left in the borehole to determine groundwater level. Date Depth (m) 2013-05-28 > 4,12 2013-06-07 > 4,12
1					2-CF	25	N=4 ACH		In	In	
	89,12	(1.22 m)			3-CF	20	N=6		In	In	
		Fill: Gray silt, some gravel to gravelly, trace of clay. Presence of rock fragments. Loose.			4-CF	23	N=5 Refusal ACH		In	In	
2					5-CR	100	RQD=0%		In	In	
	87,90	(2.44 m)			6-CR	100	RQD=32%		In	In	
3		Bedrock: Gray clayey limestone. Presence of a 150 mm layer of shale at a depth of approximately 3 metres. 60° stratification dip. Very poor to fair quality.			7-CR	84	RQD=67%		In	In	
4											
	86,22	(4.12 m)									
		End of drilling.									
5											



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BOREHOLE LOG

Number: 4956-00

Hole #: F-7

Elevation: 90,35 m

Date: 2013-05-27

Project: Reconstruction of the Québec City Armoury

Location: Québec (Québec)

Equipment used: Envirotrack
Casing si NW
Hammer weight: 63,5 kg
Drop: 760 mm

Sample type
CF Split spoon sampler
CR Diamond core
LA Wash sample
TA Auger sample
TM Thin-wall sampler
PS Fixed piston sampler

Symbols
▽ Groundwater level
Ach Chemical analysis
Ag Grain size analysis (sieving)
Sed Grain size analysis (sedimentation)
Wc Natural water content
Wl Liquid limit
Wp Plastic limit

Hydrocarbures
Odour
No non-existent
Li Light
Mo Moderate
Pe persistent
Visual aspect
No non-existent
Sc scattered
Sat Saturated

Sample condition

Disturbed Good Lost



Profile			Str	Ground water	Samples			Tests	Odour	Visual Aspect	Notes
Depth (m)	Elev (m)	Description			Cond	No et type	Rec (%)				
	90,35										
	90,29	Asphalt.									
	90,17	(0.06 m)									
		Concrete.									
		(0.18 m)									
		Fill: Gray gravel, some sand to sandy amd some silt. Loose.									
1											
	89,13	(1.22 m)									
		Fill: Brown gravelly silt, trace of clay. Presence of rock fragments.									
	88,52	(1.83 m)									
2											
	88,27	Fill: Gray gravel and sand, trace of silt. Presence of rock fragments.									
		(2.08 m)									
		Bedrock: Dark gray shale becomming a clayey limestone at a depth of 3.14 metres. Presence of a very fractured passage between 3.14 and 3.61 metres. 55° stratification dip. Very poor to fair quality.									
3											
4											
	85,82	(4.53 m)									
		End of drilling.									
5											

An open 19 mm diameter tube was left in the borehole to determine groundwater level.

Date Depth (m)
2013-05-28 3,00
2013-06-07 3,00



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BOREHOLE LOG

Number: 4956-00

Hole #: F-8

Elevation: 90,36 m

Date: 2013-05-24

Project: Reconstruction of the Québec City Armoury

Location: Québec (Québec)

Equipment used: Envirotrack

Casing si NW

Hammer weight: 63,5 kg

Drop: 760 mm

Sample condition

Disturbed

Good

Lost



Sample type

CF Split spoon sampler
CR Diamond core
LA Wash sample
TA Auger sample
TM Thin-wall sampler
PS Fixed piston sampler

Symbols

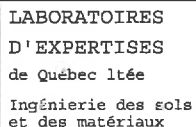
Groundwater level
Ach Chemical analysis
Ag Grain size analysis (sieving)
Sed Grain size analysis (sedimentation)
Wc Natural water content
Wl Liquid limit
Wp Plastic limit

Hydrocarbures

Odour
No non-existent
Li Light
Mo Moderate
Pe persistent
Visual aspect
No non-existent
Sc scattered
Sat Saturated

Profile

Depth (m)	Elev (m)	Description	Str	Ground water	Samples			Tests	Odour	Visual Aspect	Notes
					Cond	No et type	Rec (%)				
	90,36										
	90,33	Asphalt. (0.03 m)									
	89,98	Concrete. (0.38 m)									
	89,83	Fill: Grayish-brown gravel, some sand. (0.53 m)									
1		Bedrock: Dark gray shale becoming a clayey limestone at a depth of 1,53 metres. Very fractured until 1.53 metres deep. 50° stratification dip. Very poor to excellent quality.									
						1-CF	40	N=50 pour 150 mm Refusal	In	In	An open 19 mm diameter tube was left in the borehole to determine groundwater level. Date Depth (m) 2013-05-27 1,53 2013-06-07 1,66
						2-CR	67	RQD=0%	In	In	
2						3-CR	100	RQD=89%	In	In	
						4-CR	100	RQD=100%	In	In	
3											
	87,02	(3.34 m)									
		End of drilling.									
4											



Number: 2499-00

Elevation:

Total depth: 1,95 m

Date: 2013-06-06

Project: ENVIRONMENTAL CHARACTERIZATION OF SOILS PH.III

Location: QUÉBEC CITY ARMOURY


Equipment used:

Volume du godet :

Technician: A.T.

Duration of excavation:

Easy: ☐ **Average:** ☐ **Difficult:** ☐

 Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (sediment)

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Present

Depth: 1,95 m

Water infiltration: Slight

Pit dimension:

4,0 x 3,0

Wall:

Depth:

m

Comments:

Already excavated.



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TEST PIT REPORT

Number: 2499-00

Hole #: PE-2

Elevation:

Total depth: 2,00 m

Date: 2013-06-06

Project: ENVIRONMENTAL CHARACTERIZATION OF SOILS PH.III

Location: QUÉBEC CITY ARMOURY

Equipment used:

Volume du godet :

Technician: A.T.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit:
	loc.	no.	Tests				
				Topsoil. (0,10m) Fill: Brown sand, trace of silt and gravel.			
1		1-VR	ACH				
		2-VR					
2				(2,00m) End of the test pit.			
3							

Symbols

 Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Present

Depth: 2,00 m

Water infiltration: Slight

Pit dimension: 2,0 X 3,3

Wall:

Depth: m

Comments:

Already excavated.



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TEST PIT REPORT

Number: 2499-00

Hole #: PE-3

Elevation:

Total depth: 3,15 m

Date: 2013-06-06

Project: ENVIRONMENTAL CHARACTERIZATION OF SOILS PH.III

Location: QUÉBEC CITY ARMOURY

Equipment used:

Volume du godet :

Technician: A.T.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit:
	loc.	no.	Tests				
				Topsoil. (0,20m)			
				Fill: Brown sand, trace of silt and gravel. Presence of rootlets (<1%).			
1		1-VR					
2		2-VR					
3		3-VR	ACH				
				(3,15m) End of the test pit.			

Symbols



Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

3,5 X 3,6

Wall:

Depth:

m

Comments:

Already excavated.



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TEST PIT REPORT

Number: 2499-00

Hole #: PE-4

Elevation:

Total depth: 2,10 m

Date: 2013-06-06

Project: ENVIRONMENTAL CHARACTERIZATION OF SOILS PH.III

Location: QUÉBEC CITY ARMOURY

Equipment used:

Volume du godet :

Technician: A.T.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit:
	loc.	no.	Tests				
		1-VR		Fill: Gray gravel and sand, trace of silt. (0,25m)			
		2-VR		Fill: Brownish-gray sandy silt. Presence of rock fragments, brick (<2%), glass (<1%), and incineration residue (<1%).		Cobbles. (5%, 115mm)	
1							
		3-VR	ACH DUP				
2				(2,10m) End of the test pit.			
3							

Symbols

Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed : Grain size analysis (se)

ACH : Chemical analysis

Wc : Water content

Ll : Liquid limit

Pl : Plastic limit

Groundwater: Present

Depth: 2,05 m

Water infiltration: Slight

Pit dimension: 2,3 X 2,6

Wall:

Depth: m

Comments:

Already excavated.



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TEST PIT REPORT

Number: 2499-00

Hole #: PE-5

Elevation:

Total depth: 1,20 m

Date: 2013-06-06

Project: ENVIRONMENTAL CHARACTERIZATION OF SOILS PH.III

Location: QUÉBEC CITY ARMOURY

Equipment used:

Volume du godet :

Technician: A.T.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit:
	loc.	no.	Tests				
				Asphalt. (0,10m)			
				Concrete. (0,22m)			
		1-VR	ACH	Fill: Gray sand and gravel, some silt. Presence of rock fragments, concrete (25%) and brick (4%) debris.		Cobbles (25%, 120mm)	
				(0,50m)			
		2-VR	ACH	Fill: Brown sandy and gravelly silt.		Cobbles (4%, 100mm)	
1				(1,20m)			
				End of the test pit.			
				Bedrock reached.			
2							
3							

Symbols

▼ Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

2,7 X 3,5

Wall:

Depth:

m

Comments:

Already excavated.



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TEST PIT REPORT

Number: 2499-00

Hole #: PE-6

Elevation:

Total depth: 2,25 m

Date: 2013-06-07

Project: ENVIRONMENTAL CHARACTERIZATION OF SOILS PH.III

Location: QUÉBEC CITY ARMOURY

Equipment used:

Volume du godet :

Technician: A.T.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit:
	loc.	no.	Tests				
				Concrete. (0,20m)			
		1-VR		Fill: Gray sand and gravel, trace of silt.			
1		2-VR	ACH				
				(1,60m)			
		3-VR	ACH	Fill: Brown silt, some gravel, trace of sand. Presence of brick debris (<1%).		Cobbles (2%, 100mm) Boulders (2%, 350mm)	
2				(2,25m)			
				End of the test pit.			
				Bedrock reached.			
3							

Symbols



Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

2,5 X 3,0

Wall:

Depth:

m

Comments:

Already excavated.



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TEST PIT REPORT

Number: 2499-00

Hole #: PE-7

Elevation:

Total depth: 2,80 m

Date: 2013-06-07

Project: ENVIRONMENTAL CHARACTERIZATION OF SOILS PH.III

Location: QUÉBEC CITY ARMOURY

Equipment used:

Volume du godet :

Technician: A.T.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit:
	loc.	no.	Tests				
				Asphalt. (0,02m)			
				Concrete. (0,35m)			
				Gray gravel, trace of to some sand and silt. The gravel corresponds to fragmented rock. Presence of brick debris (<1%).		Cobbles (20%, 100mm) Boulders (50%, 450mm)	
1		1-VR	ACH				
2		2-VR					
				(2,30m)			
				Fill: Brown silt, some gravel, trace of sand. Presence of brick debris (<1%).			
		3-VR					
				(2,80m)			
3				End of the test pit.			

Symbols

▼ Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension: 2,3 X 3,7

Wall:

Depth: m

Comments:

Already excavated.



TEST PIT REPORT

Number: 2499-00

Hole #: PE-8

Elevation:

Total depth: 1,55 m

Date: 2013-06-07

Project: ENVIRONMENTAL CHARACTERIZATION OF SOILS PH.III

Location: QUÉBEC CITY ARMOURY

Equipment used:

Volume du godet :

Technician: A.T.

Duration of excavation:

Easy: ☐ Average: ☐ Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit:
	loc.	no.	Tests				
				Concrete. (0,20m)			
		1-VR	ACH	Gray gravel, trace of to some sand and silt. The gravel corresponds to fragmented rock. Presence of wood (<1%), and brick (<1%) debris. (0,70m)		Cobbles (20%, 100mm) Boulders (45%, 350mm)	
1		2-VR	ACH	Fill: Brown silt, some gravel and sand. Presence of brick (3%) and glass (<1%) debris. (1,55m)			
				End of the test pit.			

Symbols

▼ Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension: 3,1 X 4,1

Wall:

Depth: m

Comments:

Already excavated.



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TEST PIT REPORT

Number: 2499-00

Hole #: PE-9

Elevation:

Total depth: 1,45 m

Date: 2013-06-06

Project: ENVIRONMENTAL CHARACTERIZATION OF SOILS PH.III

Location: QUÉBEC CITY ARMOURY

Equipment used:

Volume du godet :

Technician: A.T.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit:
	loc.	no.	Tests				
1		1-VR		Asphalt. (0,08m)			
		2-VR		Fill: Gray gravel and sand, trace of silt. (0,23m)			
				Fill: Brown sand, trace of silt and gravel. (0,43m)			
		3-VR	ACH DUP	Fill: Brownish-black gravelly silt. Presence of rock fragments. Presence of incineration residue (1%) and brick (2%), and glass (<2%) debris. (1,45m)		Cobbles (5%, 110mm) Boulders (2%, 400mm)	
				End of the test pit.			
2							
3							

Symbols



Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

2,9 X 3,4

Wall:

Depth:

m

Comments:

Already excavated.



TEST PIT REPORT

Number: 2499-01

Hole #: PE-10

Elevation:

Total depth: 1,10 m

Date: 2013-11-26

Project: EXTENSIVE ENVIRONNEMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Volume du godet :

Technician: J.BOUD.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☒

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
1		1-VR		Asphalt. (0,08m)			
		2-VR		Fill: Gray sandy gravel, trace of silt. (0,20m)			
				Fill: Brown sand, trace of silt. (0,52m)			
		3-VR	ACH	Fill: Brown sandy gravel, trace of silt, similar to excavated rock. Presence of metal, brick, glass, ceramic and mortar debris (5%). (1,10m)			
2				End of the excavation wall, which corresponds to bedrock.			
3							
4							

Symbols



Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

1,0 x 2,3

Wall: Steady

Depth:

m

Comments:

Archaeological excavation wall.



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-11

Elevation:

Total depth: 1,10 m

Date: 2013-11-26

Project: EXTENSIVE ENVIRONNEMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Volume du godet :

Technician: J.BOUD.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☒

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
1		1-VR		Asphalt. (0,08m)			
		2-VR	ACH	Fill: Gray sandy gravel, trace of silt. (0,20m)			
				Fill: Brown sand, trace of silt. (0,52m)			
		3-VR	ACH DUP	Fill: Brown sandy gravel, trace of silt, similar to excavated rock. Presence of metal, brick, glass, ceramic and mortar debris (5%). (1,10m)			
				End of the excavation wall, which corresponds to bedrock.			
2							
3							
4							

Symbols

 Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed : Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll : Liquid limit

Pl : Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

Wall: Steady

Depth: m

Comments:

Archaeological excavation wall.



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-12

Elevation:

Total depth: 1,30 m

Date: 2013-11-26

Project: EXTENSIVE ENVIRONNEMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Volume du godet :

Technician: J. BOUD.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☒

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
1		1-VR		Asphalt. (0,07m)			
		2-VR	ACH	Fill: Gray sandy gravel, trace of silt. (0,20m)			
				Fill: Brown sand, trace of silt. (0,70m)			
		3-VR	ACH	Fill made up of deconsolidated rock similar to a dark brown silt with some sand and traces of gravel. Presence of metal, brick, glass, ceramic and mortar debris (5%). (1,30m)			
				End of the excavation wall, which corresponds to bedrock.			
2							
3							
4							

Symbols



Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed : Grain size analysis (se)

ACH : Chemical analysis

Wc : Water content

Ll : Liquid limit

Pl : Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

Wall: Steady

Depth: m

Comments:

Archaeological excavation wall.



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-14

Elevation:

Total depth: 1,00 m

Date: 2013-11-26

Project: EXTENSIVE ENVIRONNMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Volume du godet :

Technician: J. BOUD.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☒

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
1		1-VR		Asphalt. (0,07m)			
		2-VR		Fill: Gray sandy gravel, trace of silt. Presence of asphalt debris (4%). (0,20m)			
		3-VR	ACH	Fill: Brown sand, trace of silt. (0,50m)			
				Fill: Brown silty sand, some gravel, similar to partially deconsolidated excavated rock. Presence of asphalt (2%) and glass (<1%) debris. (1,00m)			
				End of the test pit.			
				Bedrock reached.			
2							
3							
4							

Symbols



Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed : Grain size analysis (sc)

ACH : Chemical analysis

Wc : Water content

LI : Liquid limit

PI : Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

0,9 X 2,0

Wall: Steady

Depth:

m

Comments:



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-15

Elevation:

Total depth: 0,90 m

Date: 2013-11-26

Project: EXTENSIVE ENVIRONNMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Volume du godet :

Technician: J.BOUD.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☒

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
		1-VR		Asphalt. (0,07m)			
		2-VR		Fill: Gray sand and gavel, trace of silt. Presence of asphalt debris (2%). (0,18m)			
		3-VR	ACH DUP	Fill: Brown sand, trace of silt. (0,45m) fill: brown gravel and sand, trace of silt, similar to excavated rock. Presence of mortar debris (<1%). (0,90m)			
1				End of test pit.			
				Bedrock reached.			
2							
3							
4							

Symbols

 Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

1,0 X 2,2

Wall: Steady

Depth:

m

Comments:



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-16

Elevation:

Total depth: 1,50 m

Date: 2013-11-26

Project: EXTENSIVE ENVIRONMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Volume du godet :

Technician: J.BOUD.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☒

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
1		1-VR	ACH	Asphalt. (0,07m)			
		2-VR		Fill: Gray sand and gravel, trace of silt. Presence of asphalt (3%), brick (<1%), and glass (<1%). (0,15m)			
		3-VR		Fill: Brown sand, trace of silt. (0,37m)			
		4-VR	ACH	Fill: Brown sandy gravel, trace of silt, similar to excavated rock. Presence of incineration residue (1%) mortar and brick (<1%) debris. (1,50m)			
2				End of the excavation wall, which corresponds to bedrock.			
3							
4							

Symbols

Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed : Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll : Liquid limit

Pl : Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

1,0 X 2,4

Wall: Steady

Depth:

m

Comments:

Archaeological excavation wall.



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-17

Elevation:

Total depth: 1,15 m

Date: 2013-11-26

Project: EXTENSIVE ENVIRONNEMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Duration of excavation:

Volume du godet :

Technician: J. BOUD.

Easy: ☐

Average: ☐

Difficult: ☒

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
		1-VR		Asphalt. (0,07m)			
		2-VR		Fill: Gray gravel and sand, trace of silt. Presence of asphalt debris (4%). (0,20m)			
				Fill: Brown sand, trace of silt. (0,50m)			
		3-VR	ACH	Fill: Brown gravelly sand, some silt, similar to excavated rock. Presence of ashes (10%) and incineration residue (2%). (1,15m)			
				End of the test pit.			
				Bedrock reached.			

Symbols

 Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed : Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll : Liquid limit

Pl : Plastic limit

Groundwater: Non observed

Pit dimension: 0,9 X 2,3

Comments:

Depth: m

Wall: Steady

Water infiltration: None

Depth: m



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-18

Elevation:

Total depth: 1,40 m

Date: 2013-12-04

Project: EXTENSIVE ENVIRONNEMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Duration of excavation:

Volume du godet :

Technician: W.C.

Easy: ☐

Average: ☒

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
1		1-VR	ACH	Asphalt. (0,10m)			
				Fill: Gray sandy gravel, trace of silt. (0,40m)			
		2-VR		Fill: Brown sand, some gravel, trace of silt. (0,70m)			
				Fill: Gray gravel, traces of sand and silt, similar to excavated rock.			
2		3-VR					
				(1,40m)			
3				End of the excavation wall, which corresponds to bedrock.			
4							

Symbols

▼ Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

Wall: Steady

Depth: m

Comments:

Archaeological excavation wall.



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-19

Elevation:

Total depth: 2,00 m

Date: 2013-12-04

Project: EXTENSIVE ENVIRONNEMENTAL CHARACTERIZATION OF SOILS

Location: MANÈGE MILITAIRE DE QUÉBEC

Equipment used: CAT 308 E

Duration of excavation:

Volume du godet :

Technician: W.C.

Easy: ☐

Average: ☒

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
1				Asphalt. (0,20m)			
		1-VR		Fill: Gray gravel, some sand, and trace of silt. (0,50m)			
		2-VR	ACH	Fill: Brown sand, some gravel, trace of silt. (1,00m)			
		3-VR	ACH DUP Ag	Fill: Gravelly sand, some silt. The gravel portion corresponds to rock fragments. (2,00m)		Cobbles (15%, 100mm)	
2				End of the excavation wall, which corresponds to bedrock.			
3							
4							

Symbols

 Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed : Grain size analysis (se)

ACH : Chemical analysis

Wc : Water content

LI : Liquid limit

PI : Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

Wall: Steady

Depth: m

Comments:

Archaeological excavation wall.



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-19

Elevation:

Total depth: 2,00 m

Date: 2013-12-04

Project: EXTENSIVE ENVIRONNEMENTAL CHARACTERIZATION OF SOILS

Location: MANÈGE MILITAIRE DE QUÉBEC

Equipment used: CAT 308 E

Duration of excavation:

Volume du godet :

Technician: W.C.

Easy: ☐

Average: ☒

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
1				Asphalt. (0,20m)			
		1-VR		Fill: Gray gravel, some sand, and trace of silt. (0,50m)			
		2-VR	ACH	Fill: Brown sand, some gravel, trace of silt. (1,00m)			
		3-VR	ACH DUP Ag	Fill: Gravelly sand, some silt. The gravel portion corresponds to rock fragments. (2,00m)		Cobbles (15%, 100mm)	
				End of the excavation wall, which corresponds to bedrock.			
2							
3							
4							

Symbols

 Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed : Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll : Liquid limit

Pl : Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

Wall: Steady

Depth: m

Comments:

Archaeological excavation wall.



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-20

Elevation:

Total depth: 1,35 m

Date: 2013-12-05

Project: EXTENSIVE ENVIRONNEMENTAL CHARACTERIZATION OF SOILS

Location: MANÈGE MILITAIRE DE QUÉBEC

Equipment used: CAT 308 E

Duration of excavation:

Volume du godet :

Technician: W.C.

Easy: ☐

Average: ☒

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
		1-VR		Asphalt. (0,10m) Fill: Gray sandy gravel, trace of silt. (0,43m) Fill: Dark brown silty and gravelly sand. The gravel portion corresponds to rock fragments.			
1		2-VR	ACH			Cobbles (10%, 100mm)	
				(1,35m) End of test pit. Bedrock reached.			
2							
3							
4							

Symbols

 Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed : Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

LI : Liquid limit

PI : Plastic limit

Groundwater: Non observed

Pit dimension:

Depth: m

Wall: Steady

Water infiltration: None

Depth: m

Comments:



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-21

Elevation:

Total depth: 0,56 m

Date: 2013-12-04

Project: EXTENSIVE ENVIRONNMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Duration of excavation:

Volume du godet :

Technician: W.C.

Easy: ☐

Average: ☐

Difficult: ☒

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
				Asphalt. (0,10m)			
				Concrete. (0,38m)			
	X	1-VR	ACH	Fill: Gray gravelly and sandy silt, trace of clay. Presence of mortar, brick and glass debris (10%). (0,56m)		Cobbles (10%,120mm)	
				End of the test pit.			
				Bedrock reached.			
1							
2							
3							
4							

Symbols



Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

Wall: Steady

Depth: m

Comments:



TEST PIT REPORT

Number: 2499-01

Hole #: PE-22

Elevation:

Total depth: 2,20 m

Date: 2013-12-05

Project: EXTENSIVE ENVIRONNMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Duration of excavation:

Volume du godet :

Technician: W.C.

Easy: ☐

Average: ☒

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
1		1-VR		Asphalt. (0,10m) Fill: Brown gravel, some sand and silt. Presence of asphalt debris (10%).			
		2-VR	ACH	(0,42m) Fill: Dark brown silty and gravelly sand, trace of silt. The gravel portion corresponds to rock fragments. Presence of mortar, brick and incineration residue (7%).			
		3-VR	ACH	(0,97m) Fill: Brown sand, some gravel, trace of silt. Presence of mortar debris (<1%). An old cast iron pipe was found during the excavation.			
		4-VR	ACH	(1,37m) Fill: Dark brown silty and gravelly sand. The gravel portion corresponds to rock fragments. Presence of mortar and brick debris (5%).			
2				(2,20m) End of the test pit. Bedrock reached.			
3							
4							

Symbols

Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

Wall: Steady

Depth: m

Comments:



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-23

Elevation:

Total depth: 3,80 m

Date: 2013-12-04

Project: EXTENSIVE ENVIRONNEMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Duration of excavation:

Volume du godet :

Technician: W.C.

Easy: ☐

Average: ☒

Difficult: ☐

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
1		1-VR		Asphalt. (0,10m)			
				Fill: Gray sandy gravel, trace of silt.			
		2-VR	ACH	(0,32m) Fill: Brown sand, some gravel, trace of silt.			
2				(0,75m)			
				Fill: Silty sand, some gravel. The gravel portion corresponds to rock fragments. Presence of brick, mortar, ceramic and glass debris (10%).			
		3-VR	ACH Ag				
3							
		4-VR	ACH				
4							
		5-VR	ACH				
				(3,80m) End of the excavation wall, which corresponds to bedrock.			

Symbols

 Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

Ll Liquid limit

Pl Plastic limit

Groundwater: Non observed

Pit dimension:

Depth: m

Wall: Steady

Water infiltration: None

Depth: m

Comments:

Archaeological excavation wall.



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TEST PIT REPORT

Number: 2499-01

Hole #: PE-24

Elevation:

Total depth: 1,60 m

Date: 2013-12-05

Project: EXTENSIVE ENVIRONNEMENTAL CHARACTERIZATION OF SOILS

Location: QUÉBEC CITY ARMOURY

Equipment used: CAT 308 E

Volume du godet :

Technician: W.C.

Duration of excavation:

Easy: ☐

Average: ☐

Difficult: ☒

Depth (m)	Samples			Description	Str	Cobbles and boulders (% and diameter)	End of pit: Refusal
	loc.	no.	Tests				
1	1-VR			Asphalt. (0,10m) Fill: Gray sandy gravel, trace of silt. Presence of mortar, asphalt, glass, and brick debris.		Cobbles. (5%, 100mm)	
				(0,55m) Fill: Dark brown silty and gravelly sand. The gravel portion corresponds to rock fragments.			
	2-VR		ACH DUP	(1,60m) End of the test pit. Bedrock reached.			
2							
3							
4							

Symbols

Groundwater level

TA : Taken with auger

VR : Manually taken

Ag : Grain size analysis
(sieving)

Sed : Grain size analysis (se

ACH : Chemical analysis

Wc : Water content

LI : Liquid limit

PI : Plastic limit

Groundwater: Non observed

Depth: m

Water infiltration: None

Pit dimension:

Wall: Steady

Depth: m

Comments:

APPENDIX “D”

Detailed Chemical Analysis Results
Chemical Analysis Certificates

TABLE A-1 : SOIL CHEMICAL ANALYSIS RESULTS

ANALYSIS PARAMETER	MDDELCC GENERIC CRITERIA (mg/kg, ppm)			CCME CRITERIA (mg/kg, ppm)								
	A	B ⁽¹⁾	C ⁽²⁾	RESIDENTIAL / PARKS	COMMERCIAL	F-1 4-CF 2.42 to 3.03 2013-05-23	F-1 4-CF DUP 2.42 to 3.03 2013-05-23	F-2 1-CF 0.28 to 0.61 2013-05-23	F-2 3-CF 1.22 to 1.83 2013-05-23	F-3 3-CF 1.22 to 1.45 2013-05-23	F-4 2-CF 0.61 to 1.22 2013-05-23	F-5 2-CF 0.61 to 1.22 2013-05-24
Sounding Sample Depth (m) Date of Sampling												
METALS												
Silver	0,8	20	40	20	40	<0,5	<0,5	<0,5	--	<0,5	<0,5	<0,5
Arsenic	15	30	50	12	12	40*	45*	<5	--	16*	12	39*
Barium	265	500	2000	500	2000	1220	2670*	97	--	1650	645	1960
Cadmium	1,3	5	20	10	22	<0,9	<0,9	<0,9	--	<0,9	<0,9	<0,9
Cobalt	20	50	300	50	300	16	17	<15	--	<15	<15	16
Chrome	75	250	800	64	87	<45	<45	<45	--	<45	<45	<45
Copper	50	100	500	63	91	<40	<40	<40	--	<40	<40	42
Tin	5	50	300	50	300	6	9	<5	--	<5	<5	7
Manganese	1000	1000	2200	11000	NA	339	401	158	--	248	173	270
Mercury	0,2	10	40	6,6	24	<0,2	<0,2	<0,2	--	<0,2	<0,2	0,3
Molybdenum	2	10	40	10	40	5	2	<2	--	<2	<2	10
Nickel	55	100	500	50	50	46	53*	<30	--	<30	<30	59*
Lead	40	500	1 000	140	260	<30	<30	32	--	<30	64	48
Selenium	3	3	10	1	2,9	1,1	<1,0	<1,0	--	<1,0	<1,0	1,6
Zinc	130	500	1 500	200	360	100	<100	<100	--	<100	<100	134
OTHER INORGANIC COMPOUNDS												
Total Sulfur	400	1000	2000	--	--	2 530	--	1 390	--	--	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)												
Acenaphthene	0,1	10	100	--	--	<0,1	--	<0,1	<0,1	--	--	--
Acenaphthylene	0,1	10	100	--	--	<0,1	--	<0,1	<0,1	--	--	--
Anthracene	0,1	10	100	2,5	32	<0,1	--	0,1	<0,1	--	--	--
Benzo (a) anthracene	0,1	1	10	1	10	<0,1	--	0,2	<0,1	--	--	--
Benzo (a) pyrene	0,1	1	10	20	72	<0,1	--	0,2	<0,1	--	--	--
Benzo (b+j+k) fluoranthene	0,1	1	10	1	10	<0,1	--	0,1	<0,1	--	--	--
Benzo (c) phenanthrene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	--	--	--
Benzo (g,h,i) perylene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	--	--	--
Chrysene	0,1	1	10	--	--	<0,1	--	0,2	<0,1	--	--	--
Dibenzo (a,h) anthracene	0,1	1	10	1	10	<0,1	--	<0,1	<0,1	--	--	--
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	--	--	--
Dibenzo (a,h) pyrene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	--	--	--
Dibenzo (a,l) pyrene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	--	--	--
7,12 -Dimethylbenzoanthracene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	--	--	--
Fluoranthene	0,1	10	100	50	180	<0,1	--	0,4	<0,1	--	--	--
Fluorene	0,1	10	100	--	--	<0,1	--	<0,1	<0,1	--	--	--
Indeno (1,2,3-cd) pyrene	0,1	1	10	1	10	<0,1	--	<0,1	<0,1	--	--	--
3-Methylcholanthrene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	--	--	--
Naphtalene	0,1	5	50	0,6	22	<0,1	--	<0,1	<0,1	--	--	--
Phenanthrene	0,1	5	50	5	50	<0,1	--	0,2	<0,1	--	--	--
Pyrene	0,1	10	100	10	100	<0,1	--	0,3	<0,1	--	--	--
2-Methylnaphtalene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	--	--	--
1-Methylnaphtalene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	--	--	--
1,3-Dimethylnaphtalene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	--	--	--
2,3,5-Trimethylnaphtalene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	--	--	--
INTEGRATING PARAMETERS												
Petroleum hydrocarbons C10-C50	300	700	3 500	--	--	<100	--	<100	--	<100	<100	--

* : Concentration exceeds the CCME's commercial criteria;

Bold and Underlined : Concentration lies within the "A-B" criteria of the "Policy";

Concentration lies within the "B-C" criteria of the "Policy";

Concentration exceeds criteria "C" of the "Policy".

TABLE A-2 : SOIL CHEMICAL ANALYSIS RESULTS

ANALYSIS PARAMETER	MDDELCC GENERIC CRITERIA (mg/kg ppm)			CCME CRITERIA (mg/kg ppm)								
	A	B ⁽¹⁾	C ⁽²⁾	RESIDENTIAL / PARKS	COMMERCIAL	F-5 4-CF 1.83 to 2.13 2013-05-24	F-6 2-CF 0.61 to 1.22 2013-05-27	F-6 4-CF 1.83 to 2.44 2013-05-27	F-7 3-CF 1.22 to 1.83 2013-05-23	PE-1 2-VR 1.00 to 1.95 2013-06-06	PE-2 1-VR 0.10 to 1.00 2013-06-06	PE-3 3-VR 2.25 to 3.15 2013-06-06
Sounding Sample Depth (m) Date of Sampling												
METALS												
Silver	0,8	20	40	20	40	<0,5	<0,5	<0,5	<0,5	--	<0,5	<0,5
Arsenic	15	30	50	12	12	41*	39*	32*	38*	--	<5	<5
Barium	265	500	2000	500	2000	867	1770	1580	2490*	--	<20	23
Cadmium	1,3	5	20	10	22	<0,9	<0,9	<0,9	<0,9	--	<0,9	<0,9
Cobalt	20	50	300	50	300	19	<15	<15	15	--	<15	<15
Chrome	75	250	800	64	87	<45	<45	<45	<45	--	<45	<45
Copper	50	100	500	63	91	51	<40	<40	<40	--	<40	<40
Tin	5	50	300	50	300	<5	17	5	6	--	<5	<5
Manganese	1000	1000	2200	11000	NA	236	421	338	338	--	113	122
Mercury	0,2	10	40	6,6	24	<0,2	0,6	0,2	<0,2	--	<0,2	<0,2
Molybdenum	2	10	40	10	40	15	5	<2	4	--	<2	<2
Nickel	55	100	500	50	50	39	37	40	--	--	<30	<30
Lead	40	500	1 000	140	260	<30	92	35	38	--	<30	<30
Selenium	3	3	10	1	2,9	2,2	1,1	<1,0	<1,0	--	<1,0	<1,0
Zinc	130	500	1 500	200	360	153	<100	<100	<100	--	<100	<100
OTHER INORGANIC COMPOUNDS												
Total Sulfur	400	1000	2000	--	--	--	--	--	--	<400	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)												
Acenaphthene	0,1	10	100	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Acenaphthylene	0,1	10	100	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Anthracene	0,1	10	100	2,5	32	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Benzo (a) anthracene	0,1	1	10	1	10	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Benzo (a) pyrene	0,1	1	10	20	72	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Benzo (b+j+k) fluoranthene	0,1	1	10	1	10	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Benzo (c) phenanthrene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Benzo (g,h,i) perylene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Chrysene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Dibenzo (a,h) anthracene	0,1	1	10	1	10	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Dibenzo (a,h) pyrene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
7,12 -Dimethylbenzoanthracene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Fluoranthene	0,1	10	100	50	180	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Fluorene	0,1	10	100	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Indeno (1,2,3-cd) pyrene	0,1	1	10	1	10	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
3-Methylcholanthrene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Naphtalene	0,1	5	50	0,6	22	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Phenanthrene	0,1	5	50	5	50	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
Pyrene	0,1	10	100	10	100	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
2-Methylnaphtalene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
1-Methylnaphtalene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
1,3-Dimethylnaphtalene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
2,3,5-Trimethylnaphtalene	0,1	1	10	--	--	<0,1	--	<0,1	<0,1	<0,1	<0,1	<0,1
INTEGRATING PARAMETERS												
Petroleum hydrocarbons C10-C50	300	700	3 500	--	--	118	--	139	<100	<100	<100	<100

*:

Concentration exceeds the CCME's commercial criteria;

Bold and Underlined :

Concentration lies within the "A-B" criteria of the "Policy";

700

Concentration lies within the "B-C" criteria of the "Policy";

3 500

Concentration exceeds criteria "C" of the "Policy".

TABLE A-3 : SOIL CHEMICAL ANALYSIS RESULTS

ANALYSIS PARAMETER	MDELCG GENERIC CRITERIA (mg/kg ppm)			CCME CRITERIA (mg/kg ppm)								
	A	B ⁽¹⁾	C ⁽²⁾	RESIDENTIAL / PARKS	COMMERCIAL	PE-4 3-VR 1,10 to 2,10 2013-06-06	PE-4 3-VR DUP 1,10 to 2,10 2013-06-06	PE-5 1-VR 0,22 to 0,50 2013-06-06	PE-5 2-VR 0,50 to 1,20 2013-06-06	PE-5 2-VR 0,75 to 1,60 2013-06-06	PE-6 3-VR 1,60 to 2,25 2013-06-06	PE-7 1-VR 0,35 to 1,35 2013-06-07
Sounding Sample Depth (m) Date of Sampling												
METALS												
Silver	0,8	20	40	20	40	<0,5	--	<0,5	<0,5	<0,5	<0,5	1,1
Arsenic	15	30	50	12	12	26*	--	12	60*	<5	36*	32*
Barium	265	500	2000	500	2000	1110	--	89	1470	103	976	1340
Cadmium	1,3	5	20	10	22	<0,9	--	<0,9	<0,9	<0,9	<0,9	<0,9
Cobalt	20	50	300	50	300	<15	--	<15	23	<15	<15	<15
Chrome	75	250	800	64	87	<45	--	<45	<45	<45	<45	<45
Copper	50	100	500	63	91	2260*	--	114*	42	<40	<40	<40
Tin	5	50	300	50	300	17	--	<5	6	<5	8	5
Manganese	1000	1000	2200	11000	NA	365	--	201	26	225	306	332
Mercury	0,2	10	40	6,6	24	0,5	--	<0,2	<0,2	<0,2	0,6	0,4
Molybdenum	2	10	40	10	40	3	--	<2	6	<2	6	5
Nickel	55	100	500	50	50	<30	--	<30	45	<30	31	35
Lead	40	500	1 000	140	260	253	--	34	34	<30	43	90
Selenium	3	3	10	1	2,9	1,2	--	<1,0	1,4	<1,0	<1,0	1,1
Zinc	130	500	1 500	200	360	223	--	<100	112	<100	<100	<100
OTHER INORGANIC COMPOUNDS												
Total Sulfur	400	1000	2000	--	--	--	--	--	--	--	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)												
Acenaphthene	0,1	10	100	--	--	<0,1	--	<1,0	<0,1	<0,1	<0,1	<0,1
Acenaphthylene	0,1	10	100	--	--	<0,1	--	<1,0	<0,1	<0,1	<0,1	0,2
Anthracene	0,1	10	100	2,5	32	<0,1	--	<1,0	0,2	<0,1	<0,1	0,2
Benzo (a) anthracene	0,1	1	10	1	10	0,3	--	<1,0	0,4	<0,1	<0,1	1,7
Benzo (a) pyrene	0,1	1	10	20	72	0,3	--	<1,0	0,3	<0,1	<0,1	1,5
Benzo (b+j+k) fluoranthene	0,1	1	10	1	10	0,3	--	<1,0	0,3	<0,1	<0,1	2,4
Benzo (c) phenanthrene	0,1	1	10	--	--	<0,1	--	<1,0	0,2	<0,1	<0,1	0,3
Benzo (g,h,i) perylene	0,1	1	10	--	--	0,1	--	<1,0	0,3	<0,1	<0,1	0,8
Chrysene	0,1	1	10	--	--	0,3	--	<1,0	0,1	<0,1	<0,1	1,5
Dibenzo (a,h) anthracene	0,1	1	10	1	10	<0,1	--	<1,0	<0,1	<0,1	<0,1	0,2
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	--	<1,0	0,1	<0,1	<0,1	0,5
Dibenzo (a,h) pyrene	0,1	1	10	--	--	<0,1	--	<1,0	<0,1	<0,1	<0,1	0,1
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	--	<1,0	<0,1	<0,1	<0,1	0,1
7,12 -Dimethylbenzoanthracene	0,1	1	10	--	--	<0,1	--	<1,0	<0,1	<0,1	<0,1	<0,1
Fluoranthene	0,1	10	100	50	180	0,6	--	<1,0	0,8	<0,1	<0,1	2,9
Fluorene	0,1	10	100	--	--	<0,1	--	<1,0	<0,1	<0,1	<0,1	<0,1
Indeno (1,2,3-cd) pyrene	0,1	1	10	1	10	0,1	--	<1,0	0,1	<0,1	<0,1	0,8
3-Methylcholanthrene	0,1	1	10	--	--	<0,1	--	<1,0	<0,1	<0,1	<0,1	<0,1
Naphtalene	0,1	5	50	0,6	22	<0,1	--	<1,0	<0,1	<0,1	<0,1	0,1
Phenanthrene	0,1	5	50	5	50	0,4	--	<1,0	0,7	<0,1	<0,1	0,5
Pyrene	0,1	10	100	10	100	0,5	--	<1,0	0,7	<0,1	<0,1	2,6
2-Methylnaphtalene	0,1	1	10	--	--	<0,1	--	<1,0	<0,1	<0,1	<0,1	0,1
1-Methylnaphtalene	0,1	1	10	--	--	<0,1	--	<1,0	<0,1	<0,1	<0,1	0,1
1,3-Dimethylnaphtalene	0,1	1	10	--	--	<0,1	--	<1,0	<0,1	<0,1	<0,1	0,2
2,3,5-Trimethylnaphtalene	0,1	1	10	--	--	<0,1	--	<1,0	<0,1	<0,1	<0,1	<0,1
INTEGRATING PARAMETERS												
Petroleum hydrocarbons C10-C50	300	700	3 500	--	--	<100	<100	1 740	--	202	--	--

*: Concentration exceeds the CCME's commercial criteria;

Bold and Underlined : Concentration lies within the "A-B" criteria of the "Policy";

700 Concentration lies within the "B-C" criteria of the "Policy";

3 500 Concentration exceeds criteria "C" of the "Policy".

TABLE A-4 : SOIL CHEMICAL ANALYSIS RESULTS

ANALYSIS PARAMETER	MDDELCC GENERIC CRITERIA (mg/kg, ppm)			CCME CRITERIA (mg/kg, ppm)								
	A	B ⁽¹⁾	C ⁽²⁾	RESIDENTIAL / PARKS	COMMERCIAL	PE-8 1-VR 0.20 to 0.70 2013-06-07	PE-8 2-VR 0.70 to 1.55 2013-06-07	PE-9 3-VR 0.43 to 1.45 2013-06-06	PE-9 3-VR DUP 0.43 to 1.45 2013-06-06			
Sounding Sample Depth (m) Date of Sampling												
METALS												
Silver	0,8	20	40	20	40	<0,5	<0,5	<0,5	--			
Arsenic	15	30	50	12	12	9	57*	58*	--			
Barium	265	500	2000	500	2000	399	1400	1300	--			
Cadmium	1,3	5	20	10	22	<0,9	<0,9	<0,9	--			
Cobalt	20	50	300	50	300	<15	<15	<15	--			
Chrome	75	250	800	64	87	<45	<45	<45	--			
Copper	50	100	500	63	91	<40	104*	42	--			
Tin	5	50	300	50	300	5	21	7	--			
Manganese	1000	1000	2200	11000	NA	225	444	386	--			
Mercury	0,2	10	40	6,6	24	2,3	0,3	--	--			
Molybdenum	2	10	40	10	40	<2	5	6	--			
Nickel	55	100	500	50	50	<30	36	59*	--			
Lead	40	500	1 000	140	260	488*	533*	48	--			
Selenium	3	3	10	1	2,9	<1,0	1,6	1,4	--			
Zinc	130	500	1 500	200	360	<100	527*	134	--			
OTHER INORGANIC COMPOUNDS												
Total Sulfur	400	1000	2000	--	--	--	--	--	--			
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)												
Acenaphthene	0,1	10	100	--	--	<0,1	<0,1	0,2	--			
Acenaphthylene	0,1	10	100	--	--	0,1	0,1	<0,1	--			
Anthracene	0,1	10	100	2,5	32	0,3	0,2	0,5	--			
Benzo (a) anthracene	0,1	1	10	1	10	0,9	0,9	1,6	--			
Benzo (a) pyrene	0,1	1	10	20	72	0,7	0,9	1,4	--			
Benzo (b+j+k) fluoranthene	0,1	1	10	1	10	1,2	1,4	2,1	--			
Benzo (c) phenanthrene	0,1	1	10	--	--	0,1	0,1	0,2	--			
Benzo (g,h,i) perylene	0,1	1	10	--	--	0,4	0,5	0,8	--			
Chrysene	0,1	1	10	--	--	0,9	1,0	1,5	--			
Dibenzo (a,h) anthracene	0,1	1	10	1	10	<0,1	0,1	0,2	--			
Dibenzo (a,i) pyrene	0,1	1	10	--	--	0,3	0,3	0,5	--			
Dibenzo (a,h) pyrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--			
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--			
7,12 -Dimethylbenzoanthracene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--			
Fluoranthene	0,1	10	100	50	180	1,7	1,9	3,1	--			
Fluorene	0,1	10	100	--	--	<0,1	<0,1	0,2	--			
Indeno (1,2,3-cd) pyrene	0,1	1	10	1	10	0,4	0,5	0,8	--			
3-Methylcholanthrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--			
Naphtalene	0,1	5	50	0,6	22	<0,1	0,1	0,1	--			
Phenanthrene	0,1	5	50	5	50	1,1	0,8	1,7	--			
Pyrene	0,1	10	100	10	100	1,3	1,5	2,4	--			
2-Methylnaphtalene	0,1	1	10	--	--	<0,1	0,1	0,2	--			
1-Methylnaphtalene	0,1	1	10	--	--	<0,1	0,2	0,2	--			
1,3-Dimethylnaphtalene	0,1	1	10	--	--	<0,1	0,2	0,2	--			
2,3,5-Trimethylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--			
INTEGRATING PARAMETERS												
Petroleum hydrocarbons C10-C50	300	700	3 500	--	--	--	--	136	233			

*: Concentration exceeds the CCME's commercial criteria;

Bold and Underlined : Concentration lies within the "A-B" criteria of the "Policy";

700 : Concentration lies within the "B-C" criteria of the "Policy";

3 500 : Concentration exceeds criteria "C" of the "Policy".

TABLE A-5 : SOIL CHEMICAL ANALYSIS RESULTS

ANALYSIS PARAMETER	MDELC			CCME								
	GENERIC CRITERIA (mg/kg ppm)			CRITERIA (mg/kg ppm)								
Sounding: Sample Depth (m) Date of Sampling	A	B ⁽¹⁾	C ⁽²⁾	RESIDENTIAL / PARKS	COMMERCIAL	PE-10 3-VR 0,52 to 1,10 2013-11-26	PE-11 2-VR 0,20 to 0,52 2013-11-26	PE-11 3-VR 0,52 to 1,10 2013-11-26	PE-11 3-VR DUP 0,52 to 1,10 2013-11-26	PE-12 2-VR 0,20 to 0,70 2013-11-26	PE-12 3-VR 0,70 to 1,30 2013-11-26	PE-13 1-VR 0,07 to 0,25 2013-11-26
METALS												
Silver	0,8	20	40	20	40	<0,5	<0,5	<0,5	--	<0,5	0,6	<0,5
Arsenic	15	30	50	12	12	15*	<5	11	--	<5	54*	<5
Barium	265	500	2000	500	2000	749	<20	722	--	<20	>2000*	73
Cadmium	1,3	5	20	10	22	<0,9	<0,9	<0,9	--	<0,9	<0,9	<0,9
Cobalt	20	50	300	50	300	16	<15	<15	--	<15	21	<15
Chromium	75	250	800	64	87	<45	<45	<45	--	<45	<45	<45
Copper	50	100	500	63	91	<40	<40	<40	--	<40	<40	<40
Tin	5	50	300	50	300	<5	<5	<5	--	<5	<5	<5
Manganese	1000	1000	2200	11000	NA	608	67	190	--	67	523	169
Mercury	0,2	10	40	6,6	24	<0,2	<0,2	<0,2	--	<0,2	<0,2	<0,2
Molybdenum	2	10	40	10	40	3	<2	<2	--	<2	5	<2
Nickel	55	100	500	50	50	<30	<30	<30	--	<30	50	<30
Lead	40	500	1 000	140	260	68	<30	91	--	<30	<30	<30
Selenium	3	3	10	1	2,9	<1,0	<1,0	<1,0	--	<1,0	1,9	<1,0
Zinc	130	500	1 500	200	360	116	<100	<100	--	<100	115	<100
OTHER INORGANIC COMPOUNDS												
Total Sulfur	400	1000	2000	--	--	--	--	1 400	--	--	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)												
Acenaphthene	0,1	10	100	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Acenaphthylene	0,1	10	100	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Anthracene	0,1	10	100	2,5	32	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Benzo (a) anthracene	0,1	1	10	1	10	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Benzo (a) pyrene	0,1	1	10	20	72	<0,1	<0,1	0,1	--	<0,1	<0,1	<0,1
Benzo (b+j+k) fluoranthene	0,1	1	10	1	10	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Benzo (c) phenanthrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Benzo (g,h,i) perylene	0,1	1	10	--	--	<0,1	<0,1	0,1	--	<0,1	<0,1	<0,1
Chrysene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Dibenzo (a,h) anthracene	0,1	1	10	1	10	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Dibenzo (a,h) pyrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
7,12-Dimethylbenzoanthracene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Fluoranthene	0,1	10	100	50	180	<0,1	<0,1	0,1	--	<0,1	<0,1	<0,1
Fluorene	0,1	10	100	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Indeno (1,2,3-cd) pyrene	0,1	1	10	1	10	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
3-Methylcholanthrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Naphtalene	0,1	5	50	0,6	22	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Phenanthrene	0,1	5	50	5	50	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
Pyrene	0,1	10	100	10	100	<0,1	<0,1	0,1	--	<0,1	<0,1	<0,1
2-Methylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
1-Methylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
1,3-Dimethylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
2,3,5-Trimethylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	<0,1
INTEGRATING PARAMETERS												
Petroleum hydrocarbons C10-C50	300	700	3 500	--	--	<100	<100	125	149	<100	<100	<100

*: Concentration exceeds the CCME's commercial criteria;

Bold and Underlined: Concentration lies within the "A-B" criteria of the "Policy";

700: Concentration lies within the "B-C" criteria of the "Policy";

3 500: Concentration exceeds criteria "C" of the "Policy".

TABLE A-6 : SOIL CHEMICAL ANALYSIS RESULTS

ANALYSIS PARAMETER	MDELC GENERIC CRITERIA (mg/kg ppm)			CCME CRITERIA (mg/kg ppm)								
	A	B ⁽¹⁾	C ⁽²⁾	RESIDENTIAL / PARKS	COMMERCIAL	PE-13 3-VR 0,60 to 1,00 2013-11-26	PE-14 3-VR 0,50 to 1,00 2013-11-26	PE-15 3-VR 0,45 to 1,00 2013-11-26	PE-15 3-VR DUP 0,45 to 1,00 2013-11-26	PE-16 1-VR 0,07 to 0,15 2013-11-26	PE-16 4-VR 0,80 to 1,50 2013-11-26	PE-17 3-VR 0,50 to 1,15 2013-11-26
Sounding Sample Depth (m) Date of Sampling												
METALS												
Silver	0,8	20	40	20	40	<0,5	<0,5	<0,5	--	<0,5	<0,5	0,6
Arsenic	15	30	50	12	12	12	51*	6	--	7	46*	22
Barium	265	500	2000	500	2000	560	971	221	--	265	1510	814
Cadmium	1,3	5	20	10	22	<0,9	<0,9	<0,9	--	<0,9	<0,9	<0,9
Cobalt	20	50	300	50	300	<15	18	<15	--	<15	22	<15
Chrome	75	250	800	64	87	<45	<45	<45	--	<45	<45	<45
Copper	50	100	500	63	91	<40	<40	<40	--	<40	46	89
Tin	5	50	300	50	300	<5	<5	<5	--	<5	<5	12
Manganese	1000	1000	2200	11000	NA	197	301	165	--	164	414	414
Mercury	0,2	10	40	6,6	24	<0,2	<0,2	<0,2	--	<0,2	0,2	1,3
Molybdenum	2	10	40	10	40	<2	6	<2	--	<2	10	3
Nickel	55	100	500	50	50	<30	38	<30	--	<30	84*	30
Lead	40	500	1 000	140	260	84	<30	51	--	<30	93	321*
Selenium	3	3	10	1	2,9	<1,0	1,3	<1,0	--	<0,1	2,2	1,7
Zinc	130	500	1 500	200	360	134	<100	<100	--	<100	180	256
OTHER INORGANIC COMPOUNDS												
Total Sulfur	400	1000	2000	--	--	--	--	--	--	--	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)												
Acenaphthene	0,1	10	100	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	0,2
Acenaphthylene	0,1	10	100	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	0,1
Anthracene	0,1	10	100	2,5	32	<0,1	<0,1	<0,1	<0,1	<0,1	0,1	0,4
Benzo (a) anthracene	0,1	1	10	1	10	0,2	<0,1	<0,1	<0,1	<0,1	0,4	0,9
Benzo (a) pyrene	0,1	1	10	20	72	0,2	<0,1	<0,1	<0,1	<0,1	0,4	0,7
Benzo (b+j+k) fluoranthene	0,1	1	10	1	10	0,3	<0,1	0,2	0,1	<0,1	0,6	1,2
Benzo (c) phenanthrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	0,1
Benzo (g,h,i) perylene	0,1	1	10	--	--	0,1	<0,1	0,1	0,1	<0,1	0,2	0,4
Chrysene	0,1	1	10	--	--	0,2	<0,1	0,1	<0,1	<0,1	0,4	0,8
Dibenzo (a,h) anthracene	0,1	1	10	1	10	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
Dibenzo (a,h) pyrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	0,1
7,12 -Dimethylbenzoanthracene	0,1	1	10	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
Fluoranthene	0,1	10	100	50	180	0,3	<0,1	0,1	<0,1	<0,1	0,8	1,8
Fluorene	0,1	10	100	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	0,2
Indeno (1,2,3-cd) pyrene	0,1	1	10	1	10	0,1	<0,1	<0,1	<0,1	<0,1	0,3	0,5
3-Methylcholanthrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
Naphtalene	0,1	5	50	0,6	22	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	0,1
Phenanthrene	0,1	5	50	5	50	0,2	<0,1	<0,1	<0,1	<0,1	0,6	1,5
Pyrene	0,1	10	100	10	100	0,3	<0,1	0,1	<0,1	<0,1	0,7	1,4
2-Methylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
1-Methylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
1,3-Dimethylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
2,3,5-Trimethylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
INTEGRATING PARAMETERS												
Petroleum hydrocarbons C10-C50	300	700	3 500	--	--	--	--	--	--	275	<100	<100

* : Concentration exceeds the CCME's commercial criteria;

Bold and Underlined : Concentration lies within the "A-B" criteria of the "Policy";**700** Concentration lies within the "B-C" criteria of the "Policy";**3 500** Concentration exceeds criteria "C" of the "Policy".

TABLE A-7 : SOIL CHEMICAL ANALYSIS RESULTS

ANALYSIS PARAMETER	MDDELCC GENERIC CRITERIA (mg/kg, ppm)			CCME CRITERIA (mg/kg, ppm)								
	A	B ⁽¹⁾	C ⁽²⁾	RESIDENTIAL / PARKS	COMMERCIAL	PE-18 1-VR 0.10 to 0.40 2013-12-04	PE-19 2-VR 0.50 to 1.00 2013-12-04	PE-19 3-VR 1.00 to 2.00 2013-12-04	PE-19 3-VR DUP 1.00 to 2.00 2013-12-04	PE-20 2-VR 0.43 to 1.35 2013-12-04	PE-21 1-VR 0.38 to 0.56 2013-12-04	PE-22 2-VR 0.42 to 0.97 2013-12-05
Sounding Sample Depth (m) Date of Sampling												
METALS												
Silver	0,8	20	40	20	40	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5
Arsenic	15	30	50	12	12	<5	<5	23*	23*	25*	17*	18*
Barium	265	500	2000	500	2000	67	<20	999	951	716	1410	803
Cadmium	1,3	5	20	10	22	<0,9	<0,9	<0,9	<0,9	<0,9	<0,9	<0,9
Cobalt	20	50	300	50	300	<15	<15	<15	<15	<15	<15	<15
Chrome	75	250	800	64	87	<45	<45	<45	<45	<45	<45	<45
Copper	50	100	500	63	91	<40	<40	43	42	118	<40	103
Tin	5	50	300	50	300	<5	<5	21	15	44	<5	360*
Manganese	1000	1000	2200	11000	NA	202	114	399	385	334	316	536
Mercury	0,2	10	40	6,6	24	<0,2	<0,2	0,7	0,6	0,4	0,2	2,1
Molybdenum	2	10	40	10	40	<2	<2	6	5	5	3	4
Nickel	55	100	500	50	50	<30	<30	35	36	35	<30	<30
Lead	40	500	1 000	140	260	<30	<30	154	128	298*	49	837*
Selenium	3	3	10	1	2,9	<1,0	<1,0	1,3	1,0	1,1	<1,0	1,2
Zinc	130	500	1 500	200	360	<100	<100	136	132	187	102	494*
OTHER INORGANIC COMPOUNDS												
Total Sulfur	400	1000	2000	--	--	--	--	--	--	500	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)												
Acenaphthene	0,1	10	100	--	--	<0,1	<0,1	0,2	--	<0,1	<0,1	--
Acenaphthylene	0,1	10	100	--	--	<0,1	<0,1	0,2	--	<0,1	<0,1	--
Anthracene	0,1	10	100	2,5	32	<0,1	<0,1	0,4	--	<0,1	<0,1	--
Benzo (a) anthracene	0,1	1	10	1	10	<0,1	<0,1	1,0	--	0,4	0,2	--
Benzo (a) pyrene	0,1	1	10	20	72	<0,1	<0,1	0,9	--	0,4	0,2	--
Benzo (b+j+k) fluoranthene	0,1	1	10	1	10	<0,1	<0,1	1,5	--	0,6	0,3	--
Benzo (c) phenanthrene	0,1	1	10	--	--	<0,1	<0,1	0,2	--	<0,1	<0,1	--
Benzo (g,h,i) perylene	0,1	1	10	--	--	<0,1	<0,1	0,5	--	0,2	0,1	--
Chrysene	0,1	1	10	--	--	<0,1	<0,1	1,0	--	0,4	0,2	--
Dibenzo (a,h) anthracene	0,1	1	10	1	10	<0,1	<0,1	<0,1	--	<0,1	<0,1	--
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	--
Dibenzo (a,h) pyrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	--
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1	<0,1	0,1	--	<0,1	<0,1	--
7,12 -Dimethylbenzoanthracene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	--
Fluoranthene	0,1	10	100	50	180	<0,1	<0,1	2,1	--	0,7	0,4	--
Fluorene	0,1	10	100	--	--	<0,1	<0,1	0,2	--	<0,1	<0,1	--
Indeno (1,2,3-cd) pyrene	0,1	1	10	1	10	<0,1	<0,1	0,6	--	0,2	0,1	--
3-Methylcholanthrene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	--
Naphtalene	0,1	5	50	0,6	22	<0,1	<0,1	0,2	--	<0,1	<0,1	--
Phenanthrene	0,1	5	50	5	50	<0,1	<0,1	1,7	--	0,4	0,3	--
Pyrene	0,1	10	100	10	100	<0,1	<0,1	1,9	--	0,7	0,4	--
2-Methylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	--
1-Methylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	--
1,3-Dimethylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	--
2,3,5-Trimethylnaphtalene	0,1	1	10	--	--	<0,1	<0,1	<0,1	--	<0,1	<0,1	--
INTEGRATING PARAMETERS												
Petroleum hydrocarbons C10-C50	300	700	3 500	--	--	--	--	<100	--	--	102	--

*: Concentration exceeds the CCME's commercial criteria;

Bold and Underlined: Concentration lies within the "A-B" criteria of the "Policy";**700**: Concentration lies within the "B-C" criteria of the "Policy";**3 500**: Concentration exceeds criteria "C" of the "Policy".

TABLE A-8 : SOIL CHEMICAL ANALYSIS RESULTS

ANALYSIS PARAMETER	MDELOC GENERIC CRITERIA (mg/kg ppm)			CCME CRITERIA (mg/kg ppm)								
	A	B ⁽¹⁾	C ⁽²⁾	RESIDENTIAL / PARKS	COMMERCIAL	PE-22 3-VR 0.97 to 1.37 2012-12-05	PE-22 4-VR 1.37 to 2.20 2012-12-05	PE-23 2-VR 0.32 to 0.75 2013-12-05	PE-23 3-VR 0.75 to 1.75 2013-12-05	PE-23 4-VR 1.75 to 2.75 2013-12-05	PE-23 5-VR 2.75 to 3.80 2013-12-05	PE-24 2-VR 0.55 to 1.60 2012-12-05
Sounding Sample Depth (m) Date of Sampling												
METALS												
Silver	0,8	20	40	20	40	<0,5	<0,5	<0,5	<0,5	—	<0,5	<0,5
Arsenic	15	30	50	12	12	<5	18*	<5	55*	—	52*	12
Barium	265	500	2000	500	2000	45	761	23	919	—	862	481
Cadmium	1,3	5	20	10	22	<0,9	<0,9	<0,9	0,9	—	<0,9	<0,9
Cobalt	20	50	300	50	300	<15	<15	<15	24	—	28	<15
Chrome	75	250	800	64	87	<45	<45	<45	<45	—	<45	<45
Copper	50	100	500	63	91	<40	70	<40	79	—	75	61
Tin	5	50	300	50	300	<5	34	<5	<5	—	<5	30
Manganese	1000	1000	2200	11000	NA	104	285	116	230	—	230	28
Mercury	0,2	10	40	6,6	24	<0,2	0,8	0,3	0,2	—	0,3	1,2
Molybdenum	2	10	40	10	40	<2	3	<2	11	—	12	<2
Nickel	55	100	500	50	50	<30	<30	<30	67*	—	71*	<30
Lead	40	500	1 000	140	260	<30	301*	<30	94	—	63	261*
Selenium	3	3	10	1	2,9	<1,0	1,7	<1,0	1,6	—	1,4	<1,0
Zinc	130	500	1 500	200	360	<100	162	<100	199	—	189	283
OTHER INORGANIC COMPOUNDS												
Total Sulfur	400	1000	2000	—	—	—	—	—	—	—	—	—
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)												
Acenaphthene	0,1	10	100	—	—	—	0,2	<0,1	—	<0,1	—	<0,1
Acenaphthylene	0,1	10	100	—	—	—	<0,1	<0,1	—	<0,1	—	<0,1
Anthracene	0,1	10	100	2,5	32	—	0,4	<0,1	—	<0,1	—	0,1
Benzo (a) anthracene	0,1	1	10	1	10	—	1,0	<0,1	—	0,2	—	0,5
Benzo (a) pyrene	0,1	1	10	20	72	—	0,9	<0,1	—	0,1	—	0,5
Benzo (b+j+k) fluoranthene	0,1	1	10	1	10	—	1,2	<0,1	—	0,2	—	0,7
Benzo (c) phenanthrene	0,1	1	10	—	—	—	0,1	<0,1	—	<0,1	—	<0,1
Benzo (g,h,i) perylene	0,1	1	10	—	—	—	0,4	<0,1	—	<0,1	—	0,2
Chrysene	0,1	1	10	—	—	—	0,9	<0,1	—	0,2	—	0,5
Dibenzo (a,h) anthracene	0,1	1	10	1	10	—	<0,1	<0,1	—	<0,1	—	<0,1
Dibenzo (a,i) pyrene	0,1	1	10	—	—	—	<0,1	<0,1	—	<0,1	—	<0,1
Dibenzo (a,h) pyrene	0,1	1	10	—	—	—	<0,1	<0,1	—	<0,1	—	<0,1
Dibenzo (a,i) pyrene	0,1	1	10	—	—	—	<0,1	<0,1	—	<0,1	—	<0,1
7,12 -Dimethylbenzoanthracene	0,1	1	10	—	—	—	<0,1	<0,1	—	<0,1	—	<0,1
Fluoranthene	0,1	10	100	50	180	—	2,1	<0,1	—	0,3	—	0,9
Fluorene	0,1	10	100	—	—	—	0,2	<0,1	—	<0,1	—	<0,1
Indeno (1,2,3-cd) pyrene	0,1	1	10	1	10	—	0,5	<0,1	—	<0,1	—	0,3
3-Methylcholanthrene	0,1	1	10	—	—	—	<0,1	<0,1	—	<0,1	—	<0,1
Naphthalene	0,1	5	50	0,6	22	—	0,2	<0,1	—	<0,1	—	<0,1
Phenanthrene	0,1	5	50	5	50	—	1,6	<0,1	—	0,2	—	0,5
Pyrene	0,1	10	100	10	100	—	1,8	<0,1	—	0,3	—	0,8
2-Methylnaphthalene	0,1	1	10	—	—	—	<0,1	<0,1	—	<0,1	—	<0,1
1-Methylnaphthalene	0,1	1	10	—	—	—	<0,1	<0,1	—	<0,1	—	<0,1
1,3-Dimethylnaphthalene	0,1	1	10	—	—	—	<0,1	<0,1	—	<0,1	—	<0,1
2,3,5-Trimethylnaphthalene	0,1	1	10	—	—	—	<0,1	<0,1	—	<0,1	—	<0,1
INTEGRATING PARAMETERS												
Petroleum hydrocarbons C10-C50	300	700	3 500	—	—	<100	—	—	—	—	—	114

* : Concentration exceeds the CCME's commercial criteria;

Bold and Underlined : Concentration lies within the "A-B" criteria of the "Policy";

Concentration lies within the "B-C" criteria of the "Policy";

Concentration exceeds criteria "C" of the "Policy".

TABLE A-9 : SOIL CHEMICAL ANALYSIS RESULTS

ANALYSIS PARAMETER	MDELCC GENERIC CRITERIA (mg/kg ppm)			CCME CRITERIA (mg/kg ppm)								
Sounding Sample Depth (m) Date of Sampling	A	B ⁽¹⁾	C ⁽²⁾	RESIDENTIAL / PARKS	COMMERCIAL	PE-24 2 YR DUP 0,55 to 1,80 243-1265						
METALS												
Silver	0,8	20	40	20	40	--						
Arsenic	15	30	50	12	12	--						
Barium	265	500	2000	500	2000	--						
Cadmium	1,3	5	20	10	22	--						
Cobalt	20	50	300	50	300	--						
Chrome	75	250	800	64	87	--						
Copper	50	100	500	63	91	--						
Tin	5	50	300	50	300	--						
Manganese	1000	1000	2200	11000	NA	--						
Mercury	0,2	10	40	6,6	24	--						
Molybdenum	2	10	40	10	40	--						
Nickel	55	100	500	50	50	--						
Lead	40	500	1 000	140	260	--						
Selenium	3	3	10	1	2,9	--						
Zinc	130	500	1 500	200	360	--						
OTHER INORGANIC COMPOUNDS												
Total Sulfur	400	1000	2000	--	--	--						
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)												
Acenaphthene	0,1	10	100	--	--	<0,1						
Acenaphthylene	0,1	10	100	--	--	<0,1						
Anthracene	0,1	10	100	2,5	32	<u>0,1</u>						
Benzo (a) anthracene	0,1	1	10	1	10	<u>0,4</u>						
Benzo (a) pyrene	0,1	1	10	20	72	<u>0,4</u>						
Benzo (b+j+k) fluoranthene	0,1	1	10	1	10	<u>0,6</u>						
Benzo (c) phenanthrene	0,1	1	10	--	--	<0,1						
Benzo (g,h,i) perylene	0,1	1	10	--	--	<u>0,2</u>						
Chrysene	0,1	1	10	--	--	<u>0,4</u>						
Dibenzo (a,h) anthracene	0,1	1	10	1	10	<0,1						
Dibenzo (a,i) pyrene	0,1	1	10	--	--	<0,1						
Dibenzo (a,h) pyrene	0,1	1	10	--	--	<0,1						
Dibenzo (a,l) pyrene	0,1	1	10	--	--	<0,1						
7,12 -Dimethylbenzoanthracene	0,1	1	10	--	--	<0,1						
Fluoranthene	0,1	10	100	50	180	<u>0,7</u>						
Fluorene	0,1	10	100	--	--	<0,1						
Indeno (1,2,3-cd) pyrene	0,1	1	10	1	10	<u>0,2</u>						
3-Methylcholanthrene	0,1	1	10	--	--	<0,1						
Naphtalene	0,1	5	50	0,6	22	<0,1						
Phenanthrene	0,1	5	50	5	50	<u>0,3</u>						
Pyrene	0,1	10	100	10	100	<u>0,6</u>						
2-Methylnaphtalene	0,1	1	10	--	--	<0,1						
1-Methylnaphtalene	0,1	1	10	--	--	<0,1						
1,3-Dimethylnaphtalene	0,1	1	10	--	--	<0,1						
2,3,5-Trimethylnaphtalene	0,1	1	10	--	--	<0,1						
INTEGRATING PARAMETERS												
Petroleum hydrocarbons C10-C50	300	700	3 500	--	--	--						

*: Concentration exceeds the CCME's commercial criteria;

Bold and Underlined : Concentration lies within the "A-B" criteria of the "Policy";

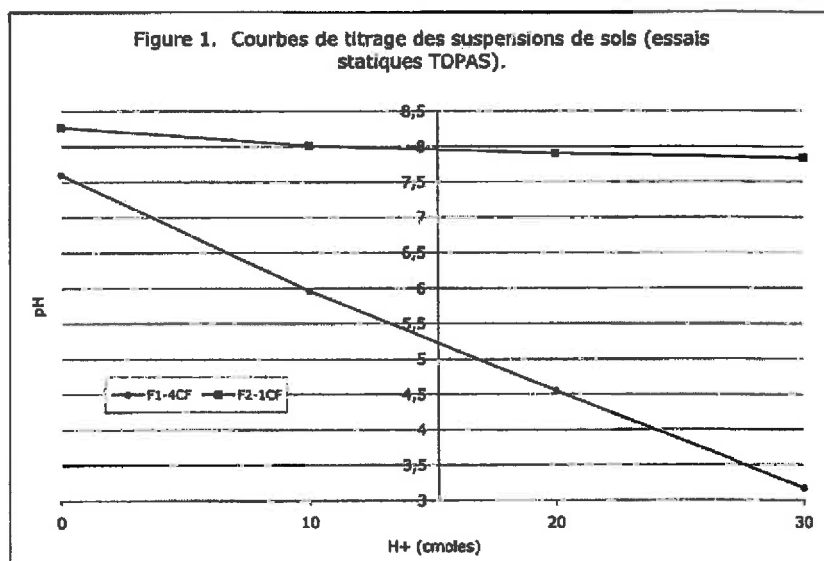
700 Concentration lies within the "B-C" criteria of the "Policy";

3 500 Concentration exceeds criteria "C" of the "Policy".

Certificat d'analyse du potentiel de génération d'acide (TDPAS) pour le compte des Laboratoires AGAT (Projet 13Q-721728)

Numéro d'échantillon	Contenu en soufre total (%)	Potentiel théorique (cmoles H ⁺ /kg de sol)	Potentiel acidogène Essai statique TDPAS	Potentiel acidogène Essai cinétique TDPAS
F2-1CF	0,139	8,3	NÉGATIF	NON REQUIS
Identification de l'échantillon : 4414639B ; Lieu du prélèvement : n.d. ; Date du prélèvement : 23/05/13. ; Numéro de la demande: 68729; Projet client : n.d. ; Conformité de l'échantillon : adéquate				
F1-4CF	0,253	15,2	POSITIF	REQUIS
Identification de l'échantillon : 4414632C ; Lieu du prélèvement : n.d. ; Date du prélèvement : 23/05/13. ; Numéro de la demande: 68729; Projet client : n.d. ; Conformité de l'échantillon : adéquate				

Résultats analytiques (essais statiques TDPAS)



Conclusions

Les résultats de l'essai cinétique confirment que l'échantillon F2-1CF n'a aucun potentiel acidogène et ne présente aucun risque environnemental en ce qui a trait aux composés soufrés inorganiques qu'il peut contenir. Quant à l'échantillon F1-4CF, il manifeste un potentiel acidogène positif qui devrait être confirmé ou infirmé par un essai cinétique.

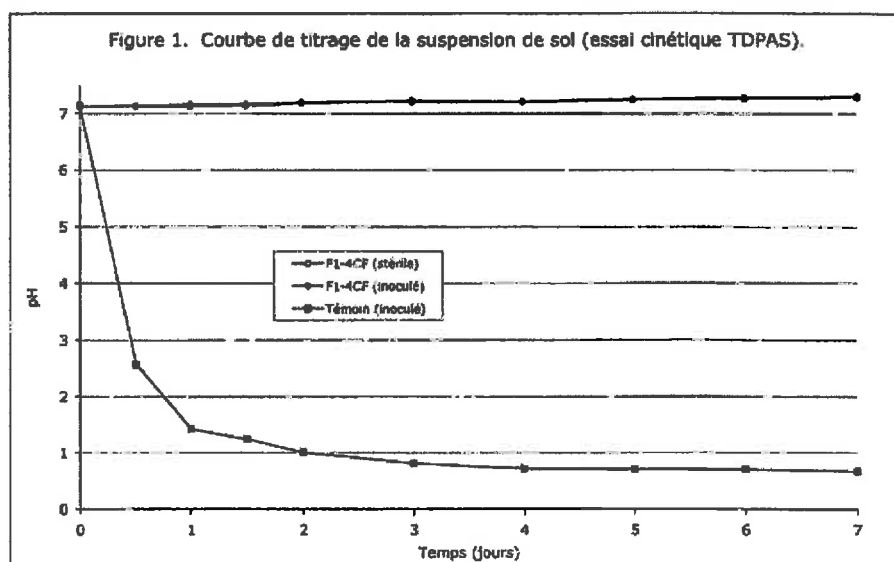
Fait à Longueuil 4 juillet 2013

Roger Guay, Ph.D., microbiologiste
Vice-président

Certificat d'analyse du potentiel de génération d'acide (TDPAS) pour le compte des Laboratoires AGAT (Projet 13Q-721728)

Numéro d'échantillon	Contenu en soufre total (%)	Potentiel théorique (cmmoles H ⁺ /kg de sol)	Potentiel acidogène Essai statique TDPAS	Potentiel acidogène Essai cinétique TDPAS
F1-4CF	0,253	15,2	POSITIF	NÉGATIF
Identification de l'échantillon : 4414632C ; Lieu du prélèvement : n.d. ; Date du prélèvement : 23/05/13 ; Numéro de la demande : 69168 ; Projet client : n.d. ; Conformité de l'échantillon : adéquate				

Résultats analytiques (essai cinétique TDPAS)



Conclusions

Les résultats de l'essai cinétique confirment que l'échantillon F1-4CF n'a aucun potentiel acidogène et ne présente aucun risque environnemental en ce qui a trait aux composés soufrés inorganiques qu'il peut contenir.

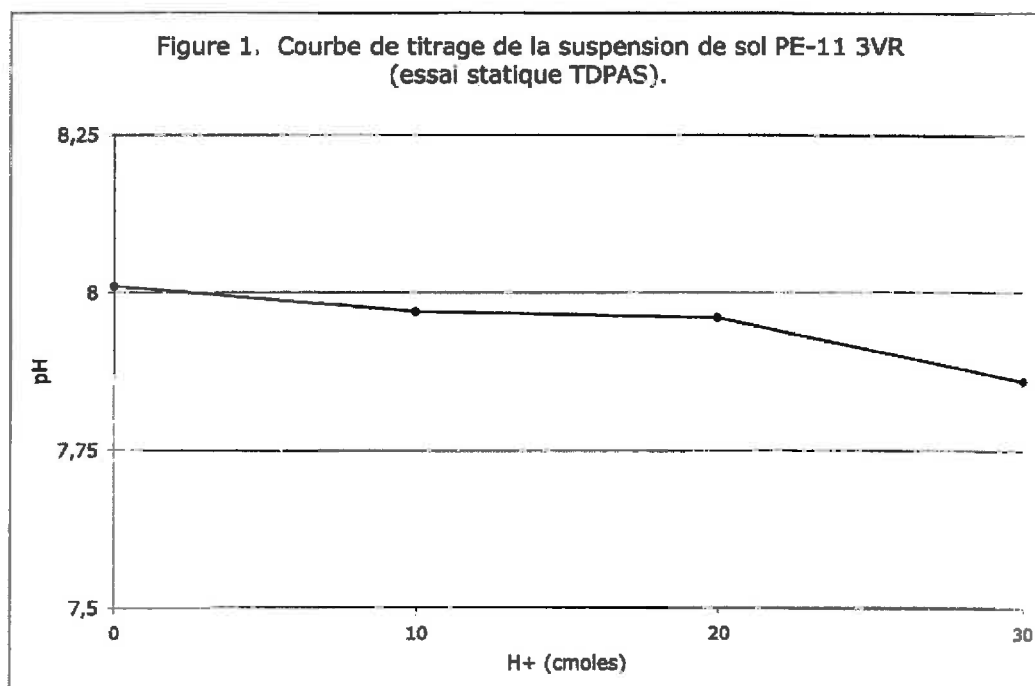
Fait à Longueuil 15 juillet 2013

Roger Guay, Ph.D., microbiologiste
Vice-président

Certificat d'analyse du potentiel de génération d'acide (TDPAS) pour le compte des Laboratoires AGAT (Projet 13Q-788174)

Numéro d'échantillon	Contenu en soufre total (%)	Potentiel théorique (cmoles H ⁺ /kg de sol)	Potentiel acidogène Essai statique TDPAS	Potentiel acidogène Essai cinétique TDPAS
PE-11 3VR	0,140	8,4	NÉGATIF	NON REQUIS
Identification de l'échantillon : 5004796C ; Lieu du prélèvement : n.d. ; Date du prélèvement : n.d. ; Numéro de la demande : 78396 ; Projet client : n.d. ; Conformité de l'échantillon : adéquate				

Résultats analytiques (essai statique TDPAS)



Conclusions

Les résultats de l'essai statique indiquent que l'échantillon PE-11 3VR n'a aucun potentiel acidogène et ne présente aucun risque environnemental en ce qui a trait aux composés soufrés inorganiques qu'il peut contenir.

Fait à Longueuil 12 décembre 2013

Roger Guay, Ph.D., microbiologiste
Vice-président

**CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC
2320, RUE DE CELLES
QUEBEC, QC G2C1X8
(418) 845-0858**

ATTENTION TO: Frederic Lortie

PROJECT: 2499-00 Manège Militaire

AGAT WORK ORDER: 13Q721728

SOIL ANALYSIS REVIEWED BY: Francois Boutin, Chimiste

TRACE ORGANICS REVIEWED BY: Catherine Angers-Grenier, Chimiste

DATE REPORTED: 2013-06-05

VERSION*: 2

PAGES (INCLUDING COVER): 10

Should you require any information regarding this analysis please contact your client services representative at (418) 266-5511

***NOTES**

VERSION 2: English version.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Certificate of Analysis

AGAT WORK ORDER: 13Q721728

PROJECT: 2499-00 Manège Militaire

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Québec, Québec
CANADA G1P 4P3
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SAMPLED BY:A.T.

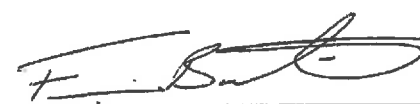
ATTENTION TO: Frederic Lortie

SAMPLING SITE:Qc

Metals (soil)									
DATE RECEIVED: 2013-06-03					DATE REPORTED: 2013-06-05				
		SAMPLE DESCRIPTION:				F1 4CF	F1 4CF DUP	F2 1CF	F4 2CF
		SAMPLE TYPE:				Soil	Soil	Soil	Soil
		DATE SAMPLED:				2013-05-23	2013-05-23	2013-05-23	2013-05-23
Parameter	Unit	G / S: A	G / S: B	G / S: C	RDL	4414632	4414638	4414639	4414641
Arsenic	mg/kg	6	30	50	5	40[B-C]	45[B-C]	<5[<A]	12[A-B]
Silver	mg/kg				0.5	<0.5	<0.5	<0.5	<0.5
Barium	mg/kg				20	1220	2670	97	645
Cadmium	mg/kg	1.5	5	20	0.9	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]
Chromium	mg/kg	85	250	800	45	<45[<A]	<45[<A]	<45[<A]	<45[<A]
Copper	mg/kg	40	100	500	40	<40[<A]	<40[<A]	<40[<A]	<40[<A]
Cobalt	mg/kg				15	18	17	<15	<15
Tin	mg/kg	5	50	300	5	6[A-B]	9[A-B]	<5[<A]	<5[<A]
Mercury	mg/kg	0.2	2	10	0.2	<0.2[<A]	<0.2[<A]	<0.2[<A]	<0.2[<A]
Nickel	mg/kg	50	100	500	30	46[<A]	53[A-B]	<30[<A]	<30[<A]
Lead	mg/kg	50	500	1000	30	<30[<A]	<30[<A]	32[<A]	64[A-B]
Manganese	mg/kg				10	339	401	158	173
Molybdenum	mg/kg				2	5	2	<2	<2
Zinc	mg/kg	110	500	1500	100	100[<A]	<100[<A]	<100[<A]	<100[<A]
Selenium	mg/kg				1.0	1.1	<1.0	<1.0	<1.0

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C)

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ATTENTION TO: Frédéric Lortie

SAMPLING SITE:Qc

Total sulfur (soil)							
DATE RECEIVED: 2013-06-03				DATE REPORTED: 2013-06-05			
		SAMPLE DESCRIPTION:		F1 4CF	F2 1CF DUP		
		SAMPLE TYPE:		Soil	Soil		
		DATE SAMPLED:		2013-05-23	2013-05-23		
		RDL		4414632	4414640		
Parameter	Unit	G / S: A	G / S: B	G / S: C	RDL		
Total Sulphur	mg/kg	400	1000	2000	400	2530[>C]	1390[B-C]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C)
4414632-4414640 Analysis subcontracted at Montreal Agat Location.

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<http://www.agatlabs.com>

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frédéric Lortie

SAMPLING SITE:Qc

PAHs (Soil)							
DATE RECEIVED: 2013-06-03				DATE REPORTED: 2013-06-05			
		SAMPLE DESCRIPTION:				F1 4CF	F2 1CF
		SAMPLE TYPE:				Soil	Soil
		DATE SAMPLED:				2013-05-23	2013-05-23
Parameter	Unit	G / S: A	G / S: B	G / S: C	RDL	4414632	4414639
Acenaphthene	mg/kg	0.1	10	100	0.1	<0.1[<A]	<0.1[<A]
Acenaphthylene	mg/kg	0.1	10	100	0.1	<0.1[<A]	<0.1[<A]
Anthracene	mg/kg	0.1	10	100	0.1	<0.1[<A]	0.1[A]
Benzo(a)anthracene	mg/kg	0.1	1	10	0.1	<0.1[<A]	0.2[A-B]
Benzo(a)pyrene	mg/kg	0.1	1	10	0.1	<0.1[<A]	0.2[A-B]
Benzo(e)pyrene	mg/kg				0.1	<0.1	0.1
Benzo(b+j+k) fluoranthene	mg/kg	0.1	1	10	0.1	<0.1[<A]	0.1[A]
Benzo(c)phenanthrene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Benzo(g,h,i)perylene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Chrysene	mg/kg	0.1	1	10	0.1	<0.1[<A]	0.2[A-B]
Dibenzo(a,h)anthracene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Dimethyl-7,12 benzo(a)anthracene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Fluoranthene	mg/kg	0.1	10	100	0.1	<0.1[<A]	0.4[A-B]
Fluorene	mg/kg	0.1	10	100	0.1	<0.1[<A]	<0.1[<A]
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Methyl-3 cholanthrene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Naphthalene	mg/kg	0.1	5	50	0.1	<0.1[<A]	<0.1[<A]
Phenanthrene	mg/kg	0.1	5	50	0.1	<0.1[<A]	0.2[A-B]
Pyrene	mg/kg	0.1	10	100	0.1	<0.1[<A]	0.3[A-B]
Methyl-1 naphthalene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Methyl-2 naphthalene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Dimethyl-1,3 naphthalene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]
Trimethyl-2,3,5 naphthalene	mg/kg	0.1	1	10	0.1	<0.1[<A]	<0.1[<A]

Certified By:
Catherine Angers


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AGAT Laboratories

Certificate of Analysis

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Qc

PAHs (Soil)				
DATE RECEIVED: 2013-06-03			DATE REPORTED: 2013-06-05	
		SAMPLE DESCRIPTION:	F1 4CF	F2 1CF
		SAMPLE TYPE:	Soil	Soil
		DATE SAMPLED:	2013-05-23	2013-05-23
			4414632	4414639
Surrogate	Unit	Acceptable Limits		
Acenaphthene-d10	%	40-140	94	99
Benzo(a)anthracene-d12	%	40-140	96	100
Pyrene-d10	%	40-140	94	98

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C)

Certified By:

Catherine Nguyen Thiem



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AGAT CERTIFICATE OF ANALYSIS

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Qc

Petroleum Hydrocarbons C10-C50 (Soil)

DATE RECEIVED: 2013-06-03

DATE REPORTED: 2013-06-05

SAMPLE DESCRIPTION:						F1 4CF	F2 1CF DUP	F4 2CF
SAMPLE TYPE:						Soil	Soil	Soil
DATE SAMPLED:						2013-05-23	2013-05-23	2013-05-23
Parameter	Unit	G / S: A	G / S: B	G / S: C	RDL	4414632	4414640	4414641
Petroleum Hydrocarbons C10-C50	mg/kg	300	700	3500	100	<100[<A]	<100[<A]	<100[<A]
Surrogate	Unit	Acceptable Limits						
Nonane	%		40-140			112	115	115

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C)

Certified By:

Catherine Lortie



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AGAT CERTIFICATE OF ANALYSIS

Page 6 of 10

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Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q721728

PROJECT: 2499-00 Manège Militaire

ATTENTION TO: Frederic Lortie

SAMPLED BY: A.T.

SAMPLING SITE: Qc

Soil Analysis															
RPT Date: 2013-06-05			DUPLICATE			REFERENCE MATERIAL			METHOD BLANK			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Metals (soil)															
Arsenic	4414874		<5	<5	0.0%	< 5	100%	80%	120%	NA	100%	100%	NA	70%	130%
Cadmium	4414874		< 0.9	< 0.9	0.0%	< 0.9	101%	80%	120%	NA	80%	120%	100%	70%	130%
Chromium	4414874		< 45	< 45	0.0%	< 45	107%	80%	120%	NA	100%	100%	96%	70%	130%
Copper	4414874		< 40	< 40	0.0%	< 40	107%	80%	120%	NA	80%	120%	97%	70%	130%
Tin	4414874		< 5	< 5	0.0%	< 5	84%	80%	120%	NA	80%	120%	95%	70%	130%
Mercury	4414874		< 0.2	< 0.2	0.0%	< 0.2	97%	100%	100%	NA	100%	100%	105%	70%	130%
Nickel	4414874		< 30	< 30	0.0%	< 30	99%	80%	120%	NA	80%	120%	93%	70%	130%
Lead	4414874		< 30	< 30	0.0%	< 30	101%	80%	120%	NA	80%	120%	93%	70%	130%
Zinc	4414874		< 100	< 100	0.0%	< 100	93%	80%	120%	NA	80%	120%	94%	70%	130%
Total sulfur (soil)															
Total Sulphur	605	4414632	2530	2270	10.8%	< 400	110%	80%	120%	120%	80%	120%	101%	80%	120%
Metals (soil)															
Silver	4414874		< 0.5	< 0.5	0.0%	< 0.5	NA	80%	120%	110%	80%	120%	NA	70%	130%
Barium	1	NA	NA	NA	0.0%	< 20	NA	80%	120%	100%	80%	120%	NA	70%	130%
Cobalt	1	NA	NA	NA	0.0%	< 15	NA	80%	120%	100%	80%	120%	NA	70%	130%
Manganese	1	NA	NA	NA	0.0%	< 10	NA	80%	120%	100%	80%	120%	NA	70%	130%
Molybdenum	1	NA	NA	NA	0.0%	< 2	NA	80%	120%	87%	80%	120%	NA	70%	130%
Selenium	4414874		< 1.0	< 1.0	0.0%	< 1.0	102%	80%	120%	NA	80%	120%	NA	70%	130%

Certified By:




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Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

PROJECT: 2499-00 Manège Militaire

SAMPLED BY: A.T.

AGAT WORK ORDER: 13Q721728

ATTENTION TO: Frederic Lortie

SAMPLING SITE: Qc

Trace Organics Analysis

RPT Date: 2013-06-05			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Petroleum Hydrocarbons C10-C50 (Soil)															
Petroleum Hydrocarbons C10-C50	1	NA	NA	NA	0.0%	< 100	83%	70%	130%	NA	100%	100%	NA	60%	140%
Nonane	1	NA	NA	NA	0.0%	107	106%	40%	140%	NA	100%	100%	NA	40%	140%
PAHs (Soil)															
Acenaphtene	1	NA	NA	NA	0.0%	< 0.1	108%	70%	130%	NA	100%	100%	NA	60%	140%
Acenaphtylene	1	NA	NA	NA	0.0%	< 0.1	116%	70%	130%	NA	100%	100%	NA	60%	140%
Anthracene	1	NA	NA	NA	0.0%	< 0.1	111%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(a)anthracene	1	NA	NA	NA	0.0%	< 0.1	106%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(a)pyrene	1	NA	NA	NA	0.0%	< 0.1	105%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(e)pyrene	1	NA	NA	NA	0.0%	< 0.1	107%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo (b+j+k) fluoranthene	1	NA	NA	NA	0.0%	< 0.1	100%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(c)phenanthrene	1	NA	NA	NA	0.0%	< 0.1	108%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(g,h,i)perylene	1	NA	NA	NA	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	NA	60%	140%
Chrysene	1	NA	NA	NA	0.0%	< 0.1	113%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,h)anthracene	1	NA	NA	NA	0.0%	< 0.1	81%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,i)pyrene	1	NA	NA	NA	0.0%	< 0.1	123%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,h)pyrene	1	NA	NA	NA	0.0%	< 0.1	112%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,l)pyrene	1	NA	NA	NA	0.0%	< 0.1	117%	70%	130%	NA	100%	100%	NA	60%	140%
Dimethyl-7,12 benzo(a)anthracene	1	NA	NA	NA	0.0%	< 0.1	125%	70%	130%	NA	100%	100%	NA	60%	140%
Fluoranthene	1	NA	NA	NA	0.0%	< 0.1	113%	70%	130%	NA	100%	100%	NA	60%	140%
Fluorene	1	NA	NA	NA	0.0%	< 0.1	115%	70%	130%	NA	100%	100%	NA	60%	140%
Indeno(1,2,3-cd)pyrene	1	NA	NA	NA	0.0%	< 0.1	89%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-3 cholanthrene	1	NA	NA	NA	0.0%	< 0.1	83%	70%	130%	NA	100%	100%	NA	60%	140%
Naphthalene	1	NA	NA	NA	0.0%	< 0.1	116%	70%	130%	NA	100%	100%	NA	60%	140%
Phenanthrene	1	NA	NA	NA	0.0%	< 0.1	110%	70%	130%	NA	100%	100%	NA	60%	140%
Pyrene	1	NA	NA	NA	0.0%	< 0.1	107%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-1 naphthalene	1	NA	NA	NA	0.0%	< 0.1	118%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-2 naphthalene	1	NA	NA	NA	0.0%	< 0.1	110%	70%	130%	NA	100%	100%	NA	60%	140%
Dimethyl-1,3 naphthalene	1	NA	NA	NA	0.0%	< 0.1	118%	70%	130%	NA	100%	100%	NA	60%	140%
Trimethyl-2,3,5 naphthalene	1	NA	NA	NA	0.0%	< 0.1	106%	70%	130%	NA	100%	100%	NA	60%	140%
Acenaphtene-d10	1	NA	NA	NA	0.0%	73	112%	40%	140%	NA	100%	100%	NA	40%	140%
Benzo(a)anthracene-d12	1	NA	NA	NA	0.0%	73	116%	40%	140%	NA	100%	100%	NA	40%	140%
Pvrene-d10	1	NA	NA	NA	0.0%	68	109%	40%	140%	NA	100%	100%	NA	40%	140%

Certified By:
Catherine Angers-Lemire


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Method Summary

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q721728

PROJECT: 2499-00 Manège Militaire

ATTENTION TO: Frederic Lortie

SAMPLED BY: A.T.

SAMPLING SITE: Qc

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis					
Silver	2013-06-04	2013-06-04	MET-161-6106F, 6108F	MA. 200 - Mét 1.2R2	ICP/MS
Arsenic	2013-06-04	2013-06-04	MET-161-6107F	EPA 3050, EPA 6020	ICP-MS
Cadmium	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Barium	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Chromium	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Copper	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Tin	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Mercury	2013-06-04	2013-06-04	MET-161-6107F	EPA 245.5	FIMS
Cobalt	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Nickel	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Lead	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Zinc	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Manganese	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Molybdenum	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Selenium	2013-06-04	2013-06-04	MET-161-6106F	EPA 3050, EPA 6020	ICP-MS
Total Sulphur	2013-06-05	2013-06-05	INOR-101-6056F	MA.310-CS	COMBUSTION

Method Summary

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q721728

PROJECT: 2499-00 Manège Militaire

ATTENTION TO: Frederic Lortie

SAMPLED BY: A.T.

SAMPLING SITE: Qc

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis					
Acenaphthene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphthylene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Anthracene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(e)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo (b+j+k) fluoranthene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(c)phenanthrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(g,h,i)perylene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Chrysene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)anthracene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,i)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,l)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-7,12 benzo(a)anthracene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluoranthene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluorene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Indeno(1,2,3-cd)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-3 cholanthrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Naphthalene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Phenanthrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-1 naphthalene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-2 naphthalene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-1,3 naphthalene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Trimethyl-2,3,5 naphthalene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphthene-d10	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene-d12	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene-d10	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Petroleum Hydrocarbons C10-C50	2013-06-03	2013-06-03	ORG-160-5100F	MEF 410 - HYD. 1.0	GC/FID
Nonane	2013-06-03	2013-06-03	PA-S-HCP	MA. 400 - HYD 1.0	GC/FID

**CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC
2320, RUE DE CELLES
QUEBEC, QC G2C1X8
(418) 845-0858**

ATTENTION TO: Frederic Lortie

PROJECT: 2499-00 Manège Militaire

AGAT WORK ORDER: 13Q721755

SOIL ANALYSIS REVIEWED BY: Francois Boutin, Chimiste

TRACE ORGANICS REVIEWED BY: Catherine Angers-Grenier, Chimiste

DATE REPORTED: 2014-02-17

VERSION*: 2

PAGES (INCLUDING COVER): 9

Should you require any information regarding this analysis please contact your client services representative at (418) 266-5511

***NOTES**

VERSION 2: English version.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Certificate of Analysis

AGAT WORK ORDER: 13Q721755

PROJECT: 2499-00 Manège Militaire

350, rue Franquet
Québec, Québec
CANADA G1P 4P3
TEL (418)266-5511
FAX (418)653-2335
<http://www.agatlabs.com>

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Qc

Metals (soil)								
DATE RECEIVED: 2013-06-03						DATE REPORTED: 2014-02-17		
					SAMPLE DESCRIPTION:	F3 3CF	F5 4CF	
					SAMPLE TYPE:	Soil	Soil	
					DATE SAMPLED:	2013-05-24	2013-05-24	
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	4414689	4414690
Arsenic	mg/kg	6	30	50	250	5	16[A-B]	41[B-C]
Silver	mg/kg					0.5	<0.5	<0.5
Cadmium	mg/kg	1.5	5	20	100	0.9	<0.9[<A]	<0.9[<A]
Barium	mg/kg					20	1650	867
Chromium	mg/kg	85	250	800	4000	45	<45[<A]	<45[<A]
Copper	mg/kg	40	100	500	2500	40	<40[<A]	51[A-B]
Tin	mg/kg	5	50	300	1500	5	<5[<A]	<5[<A]
Cobalt	mg/kg					15	<15	19
Mercury	mg/kg	0.2	2	10	50	0.2	<0.2[<A]	<0.2[<A]
Nickel	mg/kg	50	100	500	2500	30	<30[<A]	81[A-B]
Lead	mg/kg	50	500	1000	5000	30	<30[<A]	<30[<A]
Manganese	mg/kg					10	248	236
Zinc	mg/kg	110	500	1500	7500	100	<100[<A]	153[A-B]
Molybdenum	mg/kg					2	<2	15
Selenium	mg/kg					1.0	<1.0	2.2

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

Certified By:




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Certificate of Analysis

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PROJECT: 2499-00 Manège Militaire

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Qc

PAHs (Soil)						
DATE RECEIVED: 2013-06-03				DATE REPORTED: 2014-02-17		
		SAMPLE DESCRIPTION:		F5 4CF		
		SAMPLE TYPE:		Soil		
		DATE SAMPLED:		2013-05-24		
Parameter	Unit	G / S: A	G / S: B	G / S: C	RDL	4414690
Acenaphthene	mg/kg	0.1	10	100	0.1	<0.1[<A]
Acenaphthylene	mg/kg	0.1	10	100	0.1	<0.1[<A]
Anthracene	mg/kg	0.1	10	100	0.1	<0.1[<A]
Benzo(a)anthracene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Benzo(a)pyrene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Benzo(e)pyrene	mg/kg				0.1	<0.1
Benzo (b+j+k) fluoranthene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Benzo(c)phenanthrene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Benzo(g,h,i)perylene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Chrysene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Dibenzo(a,h)anthracene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Dimethyl-7,12 benzo(a)anthracene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Fluoranthene	mg/kg	0.1	10	100	0.1	<0.1[<A]
Fluorene	mg/kg	0.1	10	100	0.1	<0.1[<A]
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Methyl-3 cholanthrene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Naphthalene	mg/kg	0.1	5	50	0.1	<0.1[<A]
Phenanthrene	mg/kg	0.1	5	50	0.1	<0.1[<A]
Pyrene	mg/kg	0.1	10	100	0.1	<0.1[<A]
Methyl-1 naphthalene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Methyl-2 naphthalene	mg/kg	0.1	1	10	0.1	<0.1[<A]
Dimethyl-1,3 naphthalene	mg/kg	0.1	1	10	0.1	0.1[A]
Trimethyl-2,3,5 naphthalene	mg/kg	0.1	1	10	0.1	<0.1[<A]

Certified By:
Catherine Angers-Therrien


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AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13Q721755

PROJECT: 2499-00 Manège Militaire

350, rue Franquet
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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Qc

PAHs (Soil)			
DATE RECEIVED: 2013-06-03		DATE REPORTED: 2014-02-17	
		SAMPLE DESCRIPTION:	F5 4CF
		SAMPLE TYPE:	Soil
		DATE SAMPLED:	2013-05-24
Surrogate	Unit	Acceptable Limits	4414690
Acenaphthene-d10	%	40-140	88
Benzo(a)anthracene-d12	%	40-140	86
Pyrene-d10	%	40-140	85

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C)

Certified By:

Catherine Fyfe



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AGAT CERTIFICATE OF ANALYSIS

Page 4 of 9

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AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13Q721755

PROJECT: 2499-00 Manège Militaire

350, rue Franquet
Québec, Québec
CANADA G1P 4P3
TEL (418)286-5511
FAX (418)653-2335
<http://www.agatlabs.com>

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Qc

Petroleum Hydrocarbons C10-C50 (Soil)

DATE RECEIVED: 2013-06-03

DATE REPORTED: 2014-02-17

		SAMPLE DESCRIPTION:				F3 3CF	F5 4CF
		SAMPLE TYPE:				Soil	Soil
		DATE SAMPLED:				2013-05-24	2013-05-24
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	
Petroleum Hydrocarbons C10-C50	mg/kg	300	700	3500	10000	100	
Surrogate	Unit	Acceptable Limits				4414689	4414690
Nonane	%			40-140		<100[<A]	118[<A]
						123	116

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

Certified By:

Catherine Angers



AGAT Laboratories' procedure for signatures and signatories adheres strictly to the requirements of accreditation ISO 17025:2005 as required by CALA, SCC and MDDEP where applicable. All electronic signatures on AGAT certificates are password protected and all signatories meet their regional and scope of accreditation requirements and are approved by CALA, SCC and MDDEP.

AGAT CERTIFICATE OF ANALYSIS

Page 5 of 9

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Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC
AGAT WORK ORDER: 13Q721755
PROJECT: 2499-00 Manège Militaire
ATTENTION TO: Frederic Lortie
SAMPLED BY: A.T.
SAMPLING SITE: Qc

Soil Analysis

RPT Date: 2014-02-17			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Metals (soil)															
Arsenic	4417874		< 5	< 5	0.0%	< 5	100%	80%	120%	NA	100%	100%	100%	70%	130%
Cadmium	4414874		< 0.9	< 0.9	0.0%	< 0.9	101%	80%	120%	NA	80%	120%	100%	70%	130%
Chromium	4414874		< 45	< 45	0.0%	< 45	107%	80%	120%	NA	100%	100%	96%	70%	130%
Copper	4414874		< 40	< 40	0.0%	< 40	107%	80%	120%	NA	80%	120%	97%	70%	130%
Tin	4414874		< 5	< 5	0.0%	< 5	84%	80%	120%	NA	80%	120%	95%	70%	130%
Mercury	4414873		< 0.2	< 0.2	0.0%	< 0.2	97%	100%	100%	NA	100%	100%	105%	70%	130%
Nickel	4414874		< 30	< 30	0.0%	< 30	99%	80%	120%	NA	80%	120%	93%	70%	130%
Lead	4414874		< 30	< 30	0.0%	< 30	101%	80%	120%	NA	80%	120%	93%	70%	130%
Zinc	4414874		< 100	< 100	0.0%	< 100	93%	80%	120%	NA	80%	120%	94%	70%	130%
Metals (soil)															
Silver	4414874		< 0.5	< 0.5	0.0%	< 0.5	NA	80%	120%	110%	80%	120%	NA	70%	130%
Barium	1	NA	NA	NA	0.0%	< 20	NA	80%	120%	101%	80%	120%	NA	70%	130%
Cobalt	1	NA	NA	NA	0.0%	< 15	NA	80%	120%	100%	80%	120%	NA	70%	130%
Manganese	1	NA	NA	NA	0.0%	< 10	NA	80%	120%	104%	80%	120%	NA	70%	130%
Molybdenum	1	NA	NA	NA	0.0%	< 2	NA	80%	120%	91%	80%	120%	NA	70%	130%
Selenium	4414874		< 1.0	< 1.0	0.0%	< 1.0	102%	80%	120%	NA	80%	120%	NA	70%	130%

Certified By:



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AGAT QUALITY ASSURANCE REPORT

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Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q721755

PROJECT: 2499-00 Manège Militaire

ATTENTION TO: Frederic Lortie

SAMPLED BY: A.T.

SAMPLING SITE: Qc

Trace Organics Analysis

RPT Date: 2014-02-17			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Petroleum Hydrocarbons C10-C50 (Soil)															
Petroleum Hydrocarbons C10-C50	1	NA	NA	NA	0.0%	< 100	83%	70%	130%	NA	100%	100%	NA	60%	140%
Nonane	1	NA	NA	NA	0.0%	107	106%	40%	140%	NA	100%	100%	NA	40%	140%
PAHs (Soil)															
Acenaphtene	1	NA	NA	NA	0.0%	< 0.1	108%	70%	130%	NA	100%	100%	NA	60%	140%
Acenaphtylene	1	NA	NA	NA	0.0%	< 0.1	116%	70%	130%	NA	100%	100%	NA	60%	140%
Anthracene	1	NA	NA	NA	0.0%	< 0.1	111%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(a)anthracene	1	NA	NA	NA	0.0%	< 0.1	106%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(a)pyrene	1	NA	NA	NA	0.0%	< 0.1	105%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(e)pyrene	1	NA	NA	NA	0.0%	< 0.1	107%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo (b+j+k) fluoranthene	1	NA	NA	NA	0.0%	< 0.1	100%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(c)phenanthrene	1	NA	NA	NA	0.0%	< 0.1	108%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(g,h,i)perylene	1	NA	NA	NA	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	NA	60%	140%
Chrysene	1	NA	NA	NA	0.0%	< 0.1	113%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,h)anthracene	1	NA	NA	NA	0.0%	< 0.1	81%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,i)pyrene	1	NA	NA	NA	0.0%	< 0.1	123%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,h)pyrene	1	NA	NA	NA	0.0%	< 0.1	112%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,l)pyrene	1	NA	NA	NA	0.0%	< 0.1	117%	70%	130%	NA	100%	100%	NA	60%	140%
Dimethyl-7,12 benzo(a)anthracene	1	NA	NA	NA	0.0%	< 0.1	125%	70%	130%	NA	100%	100%	NA	60%	140%
Fluoranthene	1	NA	NA	NA	0.0%	< 0.1	113%	70%	130%	NA	100%	100%	NA	60%	140%
Fluorene	1	NA	NA	NA	0.0%	< 0.1	115%	70%	130%	NA	100%	100%	NA	60%	140%
Indeno(1,2,3-cd)pyrene	1	NA	NA	NA	0.0%	< 0.1	89%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-3 cholanthrene	1	NA	NA	NA	0.0%	< 0.1	83%	70%	130%	NA	100%	100%	NA	60%	140%
Naphthalene	1	NA	NA	NA	0.0%	< 0.1	116%	70%	130%	NA	100%	100%	NA	60%	140%
Phenanthrene	1	NA	NA	NA	0.0%	< 0.1	110%	70%	130%	NA	100%	100%	NA	60%	140%
Pyrene	1	NA	NA	NA	0.0%	< 0.1	107%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-1 naphthalene	1	NA	NA	NA	0.0%	< 0.1	118%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-2 naphthalene	1	NA	NA	NA	0.0%	< 0.1	110%	70%	130%	NA	100%	100%	NA	60%	140%
Dimethyl-1,3 naphthalene	1	NA	NA	NA	0.0%	< 0.1	118%	70%	130%	NA	100%	100%	NA	60%	140%
Trimethyl-2,3,5 naphthalene	1	NA	NA	NA	0.0%	< 0.1	106%	70%	130%	NA	100%	100%	NA	60%	140%
Acenaphtene-d10	1	NA	NA	NA	0.0%	73	112%	40%	140%	NA	100%	100%	NA	40%	140%
Benzo(a)anthracene-d12	1	NA	NA	NA	0.0%	73	116%	40%	140%	NA	100%	100%	NA	40%	140%
Pvrene-d10	1	NA	NA	NA	0.0%	68	109%	40%	140%	NA	100%	100%	NA	40%	140%

Certified By:
Catherine Lortie


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Method Summary

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q721755

PROJECT: 2499-00 Manège Militaire

ATTENTION TO: Frederic Lortie

SAMPLED BY: A.T.

SAMPLING SITE: Qc

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis					
Silver	2014-06-04	2014-06-04	MET-161-6106F, 6108F	MA. 200 - Mét 1.2R2	ICP/MS
Arsenic	2013-06-04	2013-06-04	MET-161-6107F	EPA 3050, EPA 6020	ICP-MS
Cadmium	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Barium	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Chromium	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Copper	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Tin	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Cobalt	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Mercury	2013-06-04	2013-06-04	MET-161-6107F	EPA 245.5	FIMS
Nickel	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Lead	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Manganese	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Zinc	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Molybdenum	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Selenium	2014-06-04	2014-06-04	MET-161-6106F	EPA 3050, EPA 6020	ICP-MS

Method Summary

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PROJECT: 2499-00 Manège Militaire

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SAMPLED BY: A.T.

SAMPLING SITE: Qc

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis					
Acenaphthene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphthylene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Anthracene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(e)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo (b+j+k) fluoranthene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(c)phenanthrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(g,h,i)perylene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Chrysene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)anthracene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,i)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,l)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-7,12 benzo(a)anthracene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluoranthene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluorene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Indeno(1,2,3-cd)pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-3 cholanthrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Naphthalene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Phenanthrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-1 naphthalene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-2 naphthalene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-1,3 naphthalene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Trimethyl-2,3,5 naphthalene	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphthene-d10	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene-d12	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene-d10	2013-06-03	2013-06-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Petroleum Hydrocarbons C10-C50	2013-06-03	2013-06-03	ORG-160-5100F	MEF 410 - HYD. 1.0	GC/FID
Nonane	2013-06-03	2013-06-03	PA-S-HCP	MA. 400 - HYD 1.0	GC/FID

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC
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QUEBEC, QC G2C1X8
(418) 845-0858

ATTENTION TO: Frederic Lortie

PROJECT: 2499-00 Manège Militaire

AGAT WORK ORDER: 13Q721805

SOIL ANALYSIS REVIEWED BY: Francois Boutin, Chimiste

TRACE ORGANICS REVIEWED BY: Catherine Angers-Grenier, Chimiste

DATE REPORTED: 2013-06-07

VERSION*: 2

PAGES (INCLUDING COVER): 9

Should you require any information regarding this analysis please contact your client services representative at (418) 266-5511

***NOTES**

VERSION 2: English version.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Certificate of Analysis

AGAT WORK ORDER: 13Q721805

PROJECT: 2499-00 Manège Militaire

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Qc

Metals (soil)								
DATE RECEIVED: 2013-06-03						DATE REPORTED: 2013-06-07		
		SAMPLE DESCRIPTION:				F6 4CF	F7 3CF	
		SAMPLE TYPE:				Soil	Soil	
		DATE SAMPLED:				2013-06-27	2013-05-27	
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	4414923	4414924
Arsenic	mg/kg	6	30	50	250	5	32[B-C]	38[B-C]
Silver	mg/kg					0.5	<0.5	<0.5
Cadmium	mg/kg	1.5	5	20	100	0.9	<0.9[<A]	<0.9[<A]
Barium	mg/kg					20	1580	2490
Chromium	mg/kg	85	250	800	4000	45	<45[<A]	<45[<A]
Copper	mg/kg	40	100	500	2500	40	<40[<A]	<40[<A]
Tin	mg/kg	5	50	300	1500	5	5[A]	6[A-B]
Cobalt	mg/kg					15	<15	15
Mercury	mg/kg	0.2	2	10	50	0.2	0.2[A]	<0.2[<A]
Nickel	mg/kg	50	100	500	2500	30	37[<A]	40[<A]
Lead	mg/kg	50	500	1000	5000	30	35[<A]	38[<A]
Manganese	mg/kg					10	338	338
Zinc	mg/kg	110	500	1500	7500	100	<100[<A]	<100[<A]
Molybdenum	mg/kg					2	<2	4
Selenium	mg/kg					1.0	<1.0	<1.0

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

Certified By:




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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Qc

PAHs (Soil)								
DATE RECEIVED: 2013-06-03					DATE REPORTED: 2013-06-07			
		SAMPLE DESCRIPTION:					F6 4CF	F7 3CF
		SAMPLE TYPE:					Soil	Soil
		DATE SAMPLED:					2013-05-27	2013-05-27
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	4414923	4414924
Acenaphthene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]
Acenaphthylene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]
Anthracene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]
Benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]
Benzo(a)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]
Benzo(e)pyrene	mg/kg					0.1	<0.1	<0.1
Benzo (b+j+k) fluoranthene	mg/kg	0.1	1	10	136	0.1	<0.1[<A]	<0.1[<A]
Benzo(c)phenanthrene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]
Benzo(g,h,i)perylene	mg/kg	0.1	1	10	18	0.1	<0.1[<A]	<0.1[<A]
Chrysene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)anthracene	mg/kg	0.1	1	10	82	0.1	<0.1[<A]	<0.1[<A]
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]
Dimethyl-7,12 benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]
Fluoranthene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]
Fluorene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]
Methyl-3 cholanthrene	mg/kg	0.1	1	10	150	0.1	<0.1[<A]	<0.1[<A]
Naphthalene	mg/kg	0.1	5	50	56	0.1	<0.1[<A]	<0.1[<A]
Phenanthrene	mg/kg	0.1	5	50	56	0.1	<0.1[<A]	<0.1[<A]
Pyrene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]
Methyl-1 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]
Methyl-2 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]
Dimethyl-1,3 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]
Trimethyl-2,3,5 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]

Certified By:
Catherine Lortie


AGAT Laboratories' procedure for signatures and signatories adheres strictly to the requirements of accreditation ISO 17025:2005 as required by CALA, SCC and MDDEP where applicable. All electronic signatures on AGAT certificates are password protected and all signatories meet their regional and scope of accreditation requirements and are approved by CALA, SCC and MDDEP.



Certificate of Analysis

AGAT WORK ORDER: 13Q721805

PROJECT: 2499-00 Manège Militaire

350, rue Franquet
Québec, Québec
CANADA G1P 4P3
TEL (418)268-5511
FAX (418)653-2335
<http://www.agatlabs.com>

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Qc

PAHs (Soil)				
DATE RECEIVED: 2013-06-03			DATE REPORTED: 2013-06-07	
		SAMPLE DESCRIPTION:	F6 4CF	F7 3CF
		SAMPLE TYPE:	Soil	Soil
		DATE SAMPLED:	2013-05-27	2013-05-27
			4414923	4414924
Surrogate	Unit	Acceptable Limits		
Acenaphthene-d10	%	40-140	99	91
Benzo(a)anthracene-d12	%	40-140	103	94
Pyrene-d10	%	40-140	104	95

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

Certified By:

Catherine Hughes Shewar



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<http://www.agatlabs.com>

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Qc

Petroleum Hydrocarbons C10-C50 (Soil)								
DATE RECEIVED: 2013-06-03					DATE REPORTED: 2013-06-07			
					SAMPLE DESCRIPTION:	F6 4CF	F7 3CF	
					SAMPLE TYPE:	Soil	Soil	
					DATE SAMPLED:	2013-05-27	2013-05-27	
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	4414923	4414924
Petroleum Hydrocarbons C10-C50	mg/kg	300	700	3500	10000	100	139[<A]	<100[<A]
Surrogate	Unit	Acceptable Limits						
Nonane	%			40-140			136	139

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

Certified By:
Catherine Angers-Dumas


AGAT Laboratories' procedure for signatures and signatories adheres strictly to the requirements of accreditation ISO 17025:2005 as required by CALA, SCC and MDDEP where applicable. All electronic signatures on AGAT certificates are password protected and all signatories meet their regional and scope of accreditation requirements and are approved by CALA, SCC and MDDEP.

Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q721805

PROJECT: 2499-00 Manège Militaire

ATTENTION TO: Frederic Lortie

SAMPLED BY: A.T.

SAMPLING SITE: Qc

Soil Analysis

RPT Date: 2013-06-07			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Metals (soil)															
Arsenic	4417874		< 5	< 5	0.0%	< 5	100%	80%	120%	NA	100%	100%	100%	70%	130%
Cadmium	4414874		< 0.9	< 0.9	0.0%	< 0.9	101%	80%	120%	NA	80%	120%	100%	70%	130%
Chromium	4414874		< 45	< 45	0.0%	< 45	107%	80%	120%	NA	100%	100%	96%	70%	130%
Copper	4414874		< 40	< 40	0.0%	< 40	107%	80%	120%	NA	80%	120%	97%	70%	130%
Tin	4414874		< 5	< 5	0.0%	< 5	84%	80%	120%	NA	80%	120%	95%	70%	130%
Mercury	4414873		< 0.2	< 0.2	0.0%	< 0.2	97%	100%	100%	NA	100%	100%	105%	70%	130%
Nickel	4414874		< 30	< 30	0.0%	< 30	99%	80%	120%	NA	80%	120%	93%	70%	130%
Lead	4414874		< 30	< 30	0.0%	< 30	101%	80%	120%	NA	80%	120%	93%	70%	130%
Zinc	4414874		< 100	< 100	0.0%	< 100	93%	80%	120%	NA	80%	120%	94%	70%	130%
Metals (soil)															
Silver	4414874	4414874	< 0.5	< 0.5	0.0%	< 0.5	NA	80%	120%	110%	80%	120%	NA	70%	130%
Barium	1	NA	NA	NA	0.0%	< 20	NA	80%	120%	101%	80%	120%	NA	70%	130%
Cobalt	1	NA	NA	NA	0.0%	< 15	NA	80%	120%	100%	80%	120%	NA	70%	130%
Manganese	1	NA	NA	NA	0.0%	< 10	NA	80%	120%	104%	80%	120%	NA	70%	130%
Molybdenum	1	NA	NA	NA	0.0%	< 2	NA	80%	120%	87%	80%	120%	NA	70%	130%
Selenium	4414874	4414874	< 1.0	< 1.0	0.0%	< 1.0	102%	80%	120%	NA	80%	120%	NA	70%	130%

Certified By:




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AGAT QUALITY ASSURANCE REPORT

This version replaces and cancels all previous versions, if applicable. Reproduction of this document is prohibited, in whole or part, unless authorised in writing by the laboratory. The results relate only to the samples analyzed

Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q721805

PROJECT: 2499-00 Manège Militaire

ATTENTION TO: Frederic Lortie

SAMPLED BY: A.T.

SAMPLING SITE: Qc

Trace Organics Analysis

RPT Date: 2013-06-07			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
PAHs (Soil)															
Acenaphtene	1	NA	NA	NA	0.0%	< 0.1	92%	70%	130%	NA	100%	100%	NA	60%	140%
Acenaphtylene	1	NA	NA	NA	0.0%	< 0.1	98%	70%	130%	NA	100%	100%	NA	60%	140%
Anthracene	1	NA	NA	NA	0.0%	< 0.1	99%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(a)anthracene	1	NA	NA	NA	0.0%	< 0.1	97%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(a)pyrene	1	NA	NA	NA	0.0%	< 0.1	96%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(e)pyrene	1	NA	NA	NA	0.0%	< 0.1	100%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo (b+j+k) fluoranthene	1	NA	NA	NA	0.0%	< 0.1	93%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(c)phenanthrene	1	NA	NA	NA	0.0%	< 0.1	105%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(g,h,i)perylene	1	NA	NA	NA	0.0%	< 0.1	84%	70%	130%	NA	100%	100%	NA	60%	140%
Chrysene	1	NA	NA	NA	0.0%	< 0.1	100%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,h)anthracene	1	NA	NA	NA	0.0%	< 0.1	75%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,i)pyrene	1	NA	NA	NA	0.0%	< 0.1	95%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,h)pyrene	1	NA	NA	NA	0.0%	< 0.1	91%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,l)pyrene	1	NA	NA	NA	0.0%	< 0.1	112%	70%	130%	NA	100%	100%	NA	60%	140%
Dimethyl-7,12 benzo(a)anthracene	1	NA	NA	NA	0.0%	< 0.1	102%	70%	130%	NA	100%	100%	NA	60%	140%
Fluoranthene	1	NA	NA	NA	0.0%	< 0.1	105%	70%	130%	NA	100%	100%	NA	60%	140%
Fluorene	1	NA	NA	NA	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	NA	60%	140%
Indeno(1,2,3-cd)pyrene	1	NA	NA	NA	0.0%	< 0.1	77%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-3 cholanthrene	1	NA	NA	NA	0.0%	< 0.1	68%	70%	130%	NA	100%	100%	NA	60%	140%
Naphthalene	1	NA	NA	NA	0.0%	< 0.1	92%	70%	130%	NA	100%	100%	NA	60%	140%
Phenanthrene	1	NA	NA	NA	0.0%	< 0.1	100%	70%	130%	NA	100%	100%	NA	60%	140%
Pyrene	1	NA	NA	NA	0.0%	< 0.1	97%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-1 naphthalene	1	NA	NA	NA	0.0%	< 0.1	101%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-2 naphthalene	1	NA	NA	NA	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	NA	60%	140%
Dimethyl-1,3 naphthalene	1	NA	NA	NA	0.0%	< 0.1	99%	70%	130%	NA	100%	100%	NA	60%	140%
Trimethyl-2,3,5 naphthalene	1	NA	NA	NA	0.0%	< 0.1	91%	70%	130%	NA	100%	100%	NA	60%	140%
Acenaphtene-d10	1	NA	NA	NA	0.0%	86	92%	40%	140%	NA	100%	100%	NA	40%	140%
Benzo(a)anthracene-d12	1	NA	NA	NA	0.0%	92	101%	40%	140%	NA	100%	100%	NA	40%	140%
Pyrene-d10	1	NA	NA	NA	0.0%	86	95%	40%	140%	NA	100%	100%	NA	40%	140%
Petroleum Hydrocarbons C10-C50 (Soil)															
Petroleum Hydrocarbons C10-C50	1	NA	NA	NA	0.0%	< 100	93%	70%	130%	NA	100%	100%	NA	60%	140%
Nonane	1	NA	NA	NA	0.0%	140	127%	40%	140%	NA	100%	100%	NA	40%	140%

Certified By:
Catherine Angers


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AGAT QUALITY ASSURANCE REPORT

Page 7 of 9

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Method Summary

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q721805

PROJECT: 2499-00 Manège Militaire

ATTENTION TO: Frederic Lortie

SAMPLED BY: A.T.

SAMPLING SITE: Qc

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis					
Silver	2013-06-04	2013-06-04	MET-161-6106F, 6108F	MA. 200 - Mét 1.2R2	ICP/MS
Arsenic	2013-06-04	2013-06-04	MET-161-6107F	EPA 3050, EPA 6020	ICP-MS
Cadmium	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Barium	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Chromium	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Copper	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Tin	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Cobalt	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Mercury	2013-06-04	2013-06-04	MET-161-6107F	EPA 245.5	FIMS
Nickel	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Lead	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Manganese	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Zinc	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Molybdenum	2013-06-04	2013-06-04	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Selenium	2013-06-04	2013-06-04	MET-161-6106F	EPA 3050, EPA 6020	ICP-MS

Method Summary

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q721805

PROJECT: 2499-00 Manège Militaire

ATTENTION TO: Frederic Lortie

SAMPLED BY: A.T.

SAMPLING SITE: Qc

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis					
Acenaphthene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphthylene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Anthracene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)pyrene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(e)pyrene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo (b+j+k) fluoranthene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(c)phenanthrene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(g,h,i)perylene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Chrysene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)anthracene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,i)pyrene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)pyrene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,l)pyrene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-7,12 benzo(a)anthracene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluoranthene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluorene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Indeno(1,2,3-cd)pyrene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-3 cholanthrene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Naphthalene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Phenanthrene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-1 naphthalene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-2 naphthalene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-1,3 naphthalene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Trimethyl-2,3,5 naphthalene	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphthene-d10	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene-d12	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene-d10	2013-06-04	2013-06-05	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Petroleum Hydrocarbons C10-C50	2013-06-04	2013-06-04	ORG-160-5100F	MEF 410 - HYD. 1.0	GC/FID
Nonane	2013-06-04	2013-06-04	PA-S-HCP	MA. 400 - HYD 1.0	GC/FID

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC
2320, RUE DE CELLES
QUEBEC, QC G2C1X8
(418) 845-0858

ATTENTION TO: Frederic Lortie

PROJECT: 2499-00

AGAT WORK ORDER: 13Q724970

SOIL ANALYSIS REVIEWED BY: Francois Boutin, Chimiste

TRACE ORGANICS REVIEWED BY: Francois Boutin, Chimiste

DATE REPORTED: 2014-02-17

VERSION*: 2

PAGES (INCLUDING COVER): 16

Should you require any information regarding this analysis please contact your client services representative at (418) 266-5511

***NOTES**

VERSION 2: English version.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13Q724970

PROJECT: 2499-00

350, rue Franquet
Québec, Québec
CANADA G1P 4P3
TEL (418)288-5511
FAX (418)653-2335
<http://www.agatlabs.com>

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire

Metals (soil)											
DATE RECEIVED: 2013-06-11						DATE REPORTED: 2014-02-17					
SAMPLE DESCRIPTION:						PE-2 1VR	PE-3 3VR	PE-4 3VR	PE-5 1VR	PE-5 2VR	
SAMPLE TYPE:						Soil	Soil	Soil	Soil	Soil	
DATE SAMPLED:						2013-06-06	2013-06-06	2013-06-06	2013-06-06	2013-06-06	
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	4445600	4445601	4445602	4445604	4445605
Arsenic	mg/kg	6	30	50	250	5	<5[<A]	<5[<A]	26[A-B]	12[A-B]	60[C-D]
Silver	mg/kg	2	20	40	200	0.5	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]
Cadmium	mg/kg	1.5	5	20	100	0.9	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]
Barium	mg/kg	200	500	2000	10000	20	<20[<A]	23[<A]	1110[B-C]	89[<A]	1470[B-C]
Chromium	mg/kg	85	250	800	4000	45	<45[<A]	<45[<A]	<45[<A]	<45[<A]	<45[<A]
Copper	mg/kg	40	100	500	2500	40	<40[<A]	<40[<A]	2260[C-D]	114[B-C]	42[A-B]
Tin	mg/kg	5	50	300	1500	5	<5[<A]	<5[<A]	17[A-B]	<5[<A]	6[A-B]
Cobalt	mg/kg	15	50	300	1500	15	<15[<A]	<15[<A]	<15[<A]	<15[<A]	23[A-B]
Mercury	mg/kg	0.2	2	10	50	0.2	<0.2[<A]	<0.2[<A]	0.5[A-B]	<0.2[<A]	<0.2[<A]
Nickel	mg/kg	50	100	500	2500	30	<30[<A]	<30[<A]	<30[<A]	<30[<A]	45[<A]
Lead	mg/kg	50	500	1000	5000	30	<30[<A]	<30[<A]	253[A-B]	34[<A]	34[<A]
Manganese	mg/kg	770	1000	2200	11000	10	113[<A]	122[<A]	365[<A]	201[<A]	261[<A]
Zinc	mg/kg	110	500	1500	7500	100	<100[<A]	<100[<A]	223[A-B]	<100[<A]	112[A-B]
Molybdenum	mg/kg	2	10	40	200	2	<2[<A]	<2[<A]	3[A-B]	<2[<A]	6[A-B]
Selenium	mg/kg	1	3	10	50	1.0	<1.0[<A]	<1.0[<A]	1.2[A-B]	<1.0[<A]	1.4[A-B]

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AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13Q724970

PROJECT: 2499-00

350, rue Franquet
Québec, Québec
CANADA G1P 4P3
TEL (418)268-6511
FAX (418)653-2335
<http://www.agatlabs.com>

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire

Metals (soil)											
DATE RECEIVED: 2013-06-11						DATE REPORTED: 2014-02-17					
		SAMPLE DESCRIPTION:					PE-6 2VR	PE-6 3VR	PE-7 1VR	PE-8 1VR	PE-8 2VR
		SAMPLE TYPE:					Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:					2013-06-06	2013-06-06	2013-06-07	2013-06-07	2013-06-07
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	4445606	4445607	4445608	4445609	4445610
Arsenic	mg/kg	6	30	50	250	5	<5[<A]	36[B-C]	32[B-C]	9[A-B]	57[C-D]
Silver	mg/kg	2	20	40	200	0.5	<0.5[<A]	<0.5[<A]	1.1[<A]	<0.5[<A]	<0.5[<A]
Cadmium	mg/kg	1.5	5	20	100	0.9	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]
Barium	mg/kg	200	500	2000	10000	20	103[<A]	976[B-C]	1340[B-C]	399[A-B]	1400[B-C]
Chromium	mg/kg	85	250	800	4000	45	<45[<A]	<45[<A]	<45[<A]	<45[<A]	<45[<A]
Copper	mg/kg	40	100	500	2500	40	<40[<A]	<40[<A]	<40[<A]	<40[<A]	104[B-C]
Tin	mg/kg	5	50	300	1500	5	<5[<A]	8[A-B]	5[A]	5[A]	21[A-B]
Cobalt	mg/kg	15	50	300	1500	15	<15[<A]	<15[<A]	<15[<A]	<15[<A]	<15[<A]
Mercury	mg/kg	0.2	2	10	50	0.2	<0.2[<A]	0.6[A-B]	0.4[A-B]	<0.2[<A]	2.3[B-C]
Nickel	mg/kg	50	100	500	2500	30	<30[<A]	31[<A]	35[<A]	<30[<A]	36[<A]
Lead	mg/kg	50	500	1000	5000	30	<30[<A]	43[<A]	90[A-B]	488[A-B]	543[B-C]
Manganese	mg/kg	770	1000	2200	11000	10	225[<A]	306[<A]	332[<A]	225[<A]	444[<A]
Zinc	mg/kg	110	500	1500	7500	100	<100[<A]	<100[<A]	<100[<A]	<100[<A]	537[B-C]
Molybdenum	mg/kg	2	10	40	200	2	<2[<A]	6[A-B]	5[A-B]	<2[<A]	5[A-B]
Selenium	mg/kg	1	3	10	50	1.0	<1.0[<A]	<1.0[<A]	1.1[A-B]	<1.0[<A]	1.6[A-B]

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire

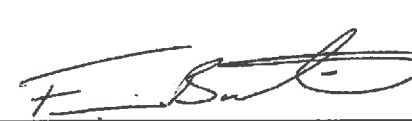

Metals (soil)									
DATE RECEIVED: 2013-06-11					DATE REPORTED: 2014-02-17				
		SAMPLE DESCRIPTION:					PE-9 3VR	F5 2CF	F6 2CF
		SAMPLE TYPE:					Soil	Soil	Soil
		DATE SAMPLED:					2013-06-06	2013-05-24	2013-05-27
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	4445611	4445614	4445615
Arsenic	mg/kg	8	30	50	250	5	58[C-D]	39[B-C]	39[B-C]
Silver	mg/kg	2	20	40	200	0.5	<0.5[<A]	<0.5[<A]	<0.5[<A]
Cadmium	mg/kg	1.5	5	20	100	0.9	<0.9[<A]	<0.9[<A]	<0.9[<A]
Barium	mg/kg	200	500	2000	10000	20	1300[B-C]	1960[B-C]	1770[B-C]
Chromium	mg/kg	85	250	800	4000	45	<45[<A]	<45[<A]	<45[<A]
Copper	mg/kg	40	100	500	2500	40	79[A-B]	42[A-B]	<40[<A]
Tin	mg/kg	5	50	300	1500	5	32[A-B]	7[A-B]	17[A-B]
Cobalt	mg/kg	15	50	300	1500	15	<15[<A]	16[A-B]	<15[<A]
Mercury	mg/kg	0.2	2	10	50	0.2	1.3[A-B]	0.3[A-B]	0.6[A-B]
Nickel	mg/kg	50	100	500	2500	30	32[<A]	59[A-B]	39[<A]
Lead	mg/kg	50	500	1000	5000	30	649[B-C]	48[<A]	92[A-B]
Manganese	mg/kg	770	1000	2200	11000	10	386[<A]	270[<A]	421[<A]
Zinc	mg/kg	110	500	1500	7500	100	2070[C-D]	134[A-B]	<100[<A]
Molybdenum	mg/kg	2	10	40	200	2	6[A-B]	10[B]	5[A-B]
Selenium	mg/kg	1	3	10	50	1.0	1.4[A-B]	1.6[A-B]	1.1[A-B]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

4445614 Frozen sample

4445615 Frozen sample

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire

Total sulfur (soil)						
DATE RECEIVED: 2013-06-11				DATE REPORTED: 2014-02-17		
				SAMPLE DESCRIPTION: PE-1 2VR		
				SAMPLE TYPE: Soil		
				DATE SAMPLED: 2013-06-06		
Parameter	Unit	G / S: A	G / S: B	G / S: C	RDL	4445599
Total Sulphur	mg/kg	400	1000	2000	400	<400[<A]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C)
4445599 The analysis is performed at Montreal AGAT location.

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire

PAHs (Soil)										
DATE RECEIVED: 2013-06-11							DATE REPORTED: 2014-02-17			
		SAMPLE DESCRIPTION:				PE-1 2VR	PE-2 1VR	PE-3 3VR	PE-4 3VR	
		SAMPLE TYPE:				Soil	Soil	Soil	Soil	
		DATE SAMPLED:				2013-06-06	2013-06-06	2013-06-06	2013-06-06	
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	4445599	4445600	4445601	4445602
Acenaphthene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Acenaphthylene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Anthracene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.3[A-B]
Benzo(a)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.3[A-B]
Benzo(e)pyrene	mg/kg					0.1	<0.1	<0.1	<0.1	0.2
Benzo (b+j+k) fluoranthene	mg/kg	0.1	1	10	136	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.3[A-B]
Benzo(c)phenanthrene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(g,h,i)perylene	mg/kg	0.1	1	10	18	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.1[A]
Chrysene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.3[A-B]
Dibenzo(a,h)anthracene	mg/kg	0.1	1	10	82	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-7,12 benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Fluoranthene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.6[A-B]
Fluorene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.1[A]
Methyl-3 cholanthrene	mg/kg	0.1	1	10	150	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Naphthalene	mg/kg	0.1	5	50	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Phenanthrene	mg/kg	0.1	5	50	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.4[A-B]
Pyrene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.5[A-B]
Methyl-1 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Methyl-2 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-1,3 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Trimethyl-2,3,5 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]

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Certificate of Analysis

AGAT WORK ORDER: 13Q724970

PROJECT: 2499-00

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC


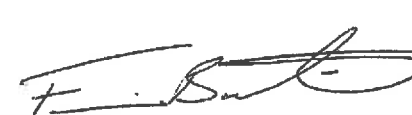
SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire

PAHs (Soil)						
DATE RECEIVED: 2013-06-11			DATE REPORTED: 2014-02-17			
		SAMPLE DESCRIPTION:	PE-1 2VR	PE-2 1VR	PE-3 3VR	PE-4 3VR
		SAMPLE TYPE:	Soil	Soil	Soil	Soil
		DATE SAMPLED:	2013-06-06	2013-06-06	2013-06-06	2013-06-06
			4445599	4445600	4445601	4445602
Surrogate	Unit	Acceptable Limits				
Acenaphtene-d10	%	40-140	83	106	97	95
Benzo(a)anthracene-d12	%	40-140	85	108	98	97
Pyrene-d10	%	40-140	80	103	94	92

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AGAT CERTIFICATE OF ANALYSIS

Page 7 of 16

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Certificate of Analysis

AGAT WORK ORDER: 13Q724970

PROJECT: 2499-00

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

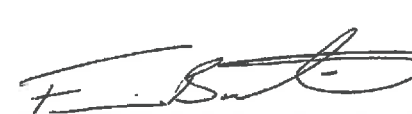

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire

PAHs (Soil)											
DATE RECEIVED: 2013-06-11						DATE REPORTED: 2014-02-17					
Parameter	Unit	SAMPLE DESCRIPTION:					PE-5 1VR		PE-5 2VR		PE-6 3VR
		SAMPLE TYPE:					Soil		Soil		Soil
		DATE SAMPLED:					2013-06-06		2013-06-06		2013-06-06
		G / S : A	G / S : B	G / S : C	G / S : D	RDL	4445604	RDL	4445605	4445606	4445607
Acenaphtene	mg/kg	0.1	10	100	100	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Acenaphthylene	mg/kg	0.1	10	100	100	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Anthracene	mg/kg	0.1	10	100	100	1.0	<1.0[<B]	0.1	0.2[A-B]	<0.1[<A]	<0.1[<A]
Benzo(a)anthracene	mg/kg	0.1	1	10	34	1.0	<1.0[<B]	0.1	0.4[A-B]	<0.1[<A]	<0.1[<A]
Benzo(a)pyrene	mg/kg	0.1	1	10	34	1.0	<1.0[<B]	0.1	0.3[A-B]	<0.1[<A]	<0.1[<A]
Benzo(e)pyrene	mg/kg					1.0	<1.0	0.1	0.2	<0.1	<0.1
Benzo (b+j+k) fluoranthene	mg/kg	0.1	1	10	136	1.0	<1.0[<B]	0.1	0.3[A-B]	<0.1[<A]	<0.1[<A]
Benzo(c)phenanthrene	mg/kg	0.1	1	10	56	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(g,h,i)perylene	mg/kg	0.1	1	10	18	1.0	<1.0[<B]	0.1	0.2[A-B]	<0.1[<A]	<0.1[<A]
Chrysene	mg/kg	0.1	1	10	34	1.0	<1.0[<B]	0.1	0.3[A-B]	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)anthracene	mg/kg	0.1	1	10	82	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	34	1.0	<1.0[<B]	0.1	0.1[A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	34	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	34	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-7,12 benzo(a)anthracene	mg/kg	0.1	1	10	34	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Fluoranthene	mg/kg	0.1	10	100	100	1.0	<1.0[<B]	0.1	0.8[A-B]	<0.1[<A]	<0.1[<A]
Fluorene	mg/kg	0.1	10	100	100	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	34	1.0	<1.0[<B]	0.1	0.1[A]	<0.1[<A]	<0.1[<A]
Methyl-3 cholanthrene	mg/kg	0.1	1	10	150	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Naphthalene	mg/kg	0.1	5	50	56	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Phenanthrene	mg/kg	0.1	5	50	56	1.0	<1.0[<B]	0.1	0.7[A-B]	<0.1[<A]	<0.1[<A]
Pyrene	mg/kg	0.1	10	100	100	1.0	<1.0[<B]	0.1	0.7[A-B]	<0.1[<A]	<0.1[<A]
Methyl-1 naphthalene	mg/kg	0.1	1	10	56	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Methyl-2 naphthalene	mg/kg	0.1	1	10	56	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-1,3 naphthalene	mg/kg	0.1	1	10	56	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Trimethyl-2,3,5 naphthalene	mg/kg	0.1	1	10	56	1.0	<1.0[<B]	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]

Certified By:

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AGAT Laboratories

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PROJECT: 2499-00

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire

PAHs (Soil)						
DATE RECEIVED: 2013-06-11			DATE REPORTED: 2014-02-17			
			SAMPLE DESCRIPTION:	PE-5 1VR	PE-5 2VR	PE-6 2VR
			SAMPLE TYPE:	Soil	Soil	Soil
			DATE SAMPLED:	2013-06-06	2013-06-06	2013-06-06
			Acceptable Limits	4445604	4445605	4445606
Surrogate	Unit					
Acenaphthene-d10	%	40-140		93	96	89
Benzo(a)anthracene-d12	%	40-140		94	98	89
Pyrene-d10	%	40-140		100	95	84

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 13Q724970

PROJECT: 2499-00

350, rue Franquet
Québec, Québec
CANADA G1P 4P3
TEL (418)286-5511
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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

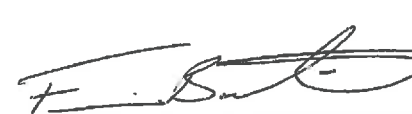

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire

PAHs (Soil)											
DATE RECEIVED: 2013-06-11						DATE REPORTED: 2014-02-17					
SAMPLE DESCRIPTION:						PE-7 1VR	PE-8 1VR	PE-8 2VR	PE-9 3VR	F2 3CF	
SAMPLE TYPE:						Soil	Soil	Soil	Soil	Soil	
DATE SAMPLED:						2013-06-07	2013-06-07	2013-06-07	2013-06-06	2013-05-23	
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	4445608	4445609	4445610	4445611	4445613
Acenaphtene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.2[A-B]	<0.1[<A]
Acenaphtylene	mg/kg	0.1	10	100	100	0.1	0.2[A-B]	0.1[A]	0.1[A]	<0.1[<A]	<0.1[<A]
Anthracene	mg/kg	0.1	10	100	100	0.1	0.2[A-B]	0.3[A-B]	0.2[A-B]	0.5[A-B]	<0.1[<A]
Benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	1.7[B-C]	0.9[A-B]	0.9[A-B]	1.6[B-C]	<0.1[<A]
Benzo(a)pyrene	mg/kg	0.1	1	10	34	0.1	1.5[B-C]	0.7[A-B]	0.9[A-B]	1.4[B-C]	<0.1[<A]
Benzo(e)pyrene	mg/kg					0.1	1.1	0.5	0.7	1.0	<0.1
Benzo (b+j+k) fluoranthene	mg/kg	0.1	1	10	136	0.1	2.4[B-C]	1.2[B-C]	1.4[B-C]	2.1[B-C]	<0.1[<A]
Benzo(c)phenanthrene	mg/kg	0.1	1	10	56	0.1	0.3[A-B]	0.1[A]	0.1[A]	0.2[A-B]	<0.1[<A]
Benzo(g,h,i)perylene	mg/kg	0.1	1	10	18	0.1	0.8[A-B]	0.4[A-B]	0.5[A-B]	0.8[A-B]	<0.1[<A]
Chrysene	mg/kg	0.1	1	10	34	0.1	1.5[B-C]	0.9[A-B]	1.0[B]	1.5[B-C]	<0.1[<A]
Dibenzo(a,h)anthracene	mg/kg	0.1	1	10	82	0.1	0.2[A-B]	<0.1[<A]	0.1[A]	0.2[A-B]	<0.1[<A]
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	34	0.1	0.5[A-B]	0.3[A-B]	0.3[A-B]	0.5[A-B]	<0.1[<A]
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	34	0.1	0.1[A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	34	0.1	0.1[A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-7,12 benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Fluoranthene	mg/kg	0.1	10	100	100	0.1	2.9[A-B]	1.7[A-B]	1.9[A-B]	3.1[A-B]	<0.1[<A]
Fluorene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	0.2[A-B]	<0.1[<A]
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	34	0.1	0.8[A-B]	0.4[A-B]	0.5[A-B]	0.8[A-B]	<0.1[<A]
Methyl-3 cholanthrene	mg/kg	0.1	1	10	150	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Naphthalene	mg/kg	0.1	5	50	56	0.1	0.1[A]	<0.1[<A]	0.1[A]	0.1[A]	<0.1[<A]
Phenanthrene	mg/kg	0.1	5	50	56	0.1	0.5[A-B]	1.1[A-B]	0.8[A-B]	1.7[A-B]	<0.1[<A]
Pyrene	mg/kg	0.1	10	100	100	0.1	2.6[A-B]	1.3[A-B]	1.5[A-B]	2.4[A-B]	<0.1[<A]
Methyl-1 naphthalene	mg/kg	0.1	1	10	56	0.1	0.1[A]	<0.1[<A]	0.1[A]	0.2[A-B]	<0.1[<A]
Methyl-2 naphthalene	mg/kg	0.1	1	10	56	0.1	0.1[A]	<0.1[<A]	0.2[A-B]	0.2[A-B]	<0.1[<A]
Dimethyl-1,3 naphthalene	mg/kg	0.1	1	10	56	0.1	0.2[A-B]	<0.1[<A]	0.2[A-B]	0.2[A-B]	0.1[A]
Trimethyl-2,3,5 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]

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Certificate of Analysis

AGAT WORK ORDER: 13Q724970

PROJECT: 2499-00

350, rue Franquet
Québec, Québec
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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire


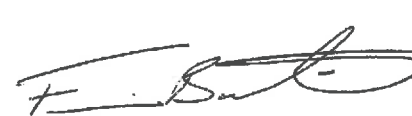
PAHs (Soil)								
DATE RECEIVED: 2013-06-11				DATE REPORTED: 2014-02-17				
			SAMPLE DESCRIPTION:	PE-7 1VR	PE-8 1VR	PE-8 2VR	PE-9 3VR	F2 3CF
			SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
			DATE SAMPLED:	2013-06-07	2013-06-07	2013-06-07	2013-06-06	2013-05-23
Surrogate	Unit	Acceptable Limits		4445608	4445609	4445610	4445611	4445613
Acenaphthene-d10	%	40-140		87	85	95	93	89
Benzo(a)anthracene-d12	%	40-140		89	87	96	95	92
Pyrene-d10	%	40-140		87	85	94	93	86

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

4445604 The LDR was increased due to the dilution performed on the sample.

4445613 Frozen sample

Certified By:



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AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13Q724970

PROJECT: 2499-00

350, rue Franquet
Québec, Québec
CANADA G1P 4P3
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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:A.T.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire

Petroleum Hydrocarbons C10-C50 (Soil)										
DATE RECEIVED: 2013-06-11						DATE REPORTED: 2014-02-17				
		SAMPLE DESCRIPTION:				PE-1 2VR	PE-2 1VR	PE-3 3VR	PE-4 3VR	PE-4 3VR DUP
		SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:				2013-06-06	2013-06-06	2013-06-06	2013-06-06	2013-06-06
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	4445599	4445600	4445601	4445602
Petroleum Hydrocarbons C10-C50	mg/kg	300	700	3500	10000	100	<100[<A]	<100[<A]	<100[<A]	<100[<A]
Surrogate	Unit	Acceptable Limits								
Nonane	%			40-140			120	125	116	95
		SAMPLE DESCRIPTION:				PE-5 1VR	PE-6 2VR	PE-9 3VR	PE-9 3VR DUP	
		SAMPLE TYPE:				Soil	Soil	Soil	Soil	
		DATE SAMPLED:				2013-06-06	2013-06-06	2013-06-06	2013-06-06	
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	4445604	4445606	4445611	4445612
Petroleum Hydrocarbons C10-C50	mg/kg	300	700	3500	10000	100	1740[B-C]	202[<A]	136[<A]	233[<A]
Surrogate	Unit	Acceptable Limits								
Nonane	%			40-140			120	116	122	112

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

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AGAT CERTIFICATE OF ANALYSIS

Page 12 of 16

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Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q724970

PROJECT: 2499-00

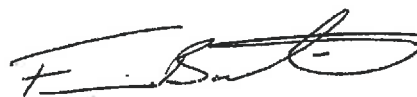
ATTENTION TO: Frederic Lortie

SAMPLED BY: A.T.

SAMPLING SITE: Manège militaire

Soil Analysis															
RPT Date: 2014-02-17			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total sulfur (soil)															
Total Sulphur	1	NA	NA	NA	0.0%	< 400	107%	80%	120%	95%	80%	120%	118%	80%	120%
Metals (soil)															
Arsenic	1	NA	NA	NA	0.0%	< 5	80%	80%	120%	NA	100%	100%	NA	70%	130%
Cadmium	1	NA	NA	NA	0.0%	< 0.9	99%	80%	120%	NA	80%	120%	NA	70%	130%
Chromium	1	NA	NA	NA	0.0%	< 45	90%	80%	120%	NA	100%	100%	NA	70%	130%
Copper	1	NA	NA	NA	0.0%	< 40	106%	80%	120%	NA	80%	120%	NA	70%	130%
Tin	1	NA	NA	NA	0.0%	< 5	99%	80%	120%	NA	80%	120%	NA	70%	130%
Mercury	4445600	4445600	< 0.2	< 0.2	0.0%	< 0.2	110%	100%	100%	NA	100%	100%	116%	70%	130%
Nickel	1	NA	NA	NA	0.0%	< 30	95%	80%	120%	NA	80%	120%	NA	70%	130%
Lead	1	NA	NA	NA	0.0%	< 30	90%	80%	120%	NA	80%	120%	NA	70%	130%
Zinc	1	NA	NA	NA	0.0%	< 100	93%	80%	120%	NA	80%	120%	NA	70%	130%
Metals (soil)															
Silver	1	NA	NA	NA	0.0%	< 0.5	103%	80%	120%	104%	80%	120%	NA	70%	130%
Barium	1	NA	NA	NA	0.0%	< 20	NA	80%	120%	102%	80%	120%	NA	70%	130%
Cobalt	1	NA	NA	NA	0.0%	< 15	90%	80%	120%	101%	80%	120%	NA	70%	130%
Manganese	1	NA	NA	NA	0.0%	< 10	98%	80%	120%	105%	80%	120%	NA	70%	130%
Molybdenum	1	NA	NA	NA	0.0%	< 2	97%	80%	120%	NA	80%	120%	NA	70%	130%
Selenium	1	NA	NA	NA	0.0%	< 1.0	88%	80%	120%	97%	80%	120%	NA	70%	130%

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Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q724970

PROJECT: 2499-00

ATTENTION TO: Frederic Lortie

SAMPLED BY: A.T.

SAMPLING SITE: Manège militaire

Trace Organics Analysis

RPT Date: 2014-02-17			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Petroleum Hydrocarbons C10-C50 (Soil)															
Petroleum Hydrocarbons C10-C50	1	4445600	< 100	< 100	0.0%	< 100	93%	70%	130%	NA	100%	100%	80%	60%	140%
Nonane	1	4445600	125	118	5.8%	125	122%	40%	140%	NA	100%	100%	130%	40%	140%
PAHs (Soil)															
Acenaphtene	1	NA	NA	NA	0.0%	< 0.1	98%	70%	130%	NA	100%	100%	NA	60%	140%
Acenaphtylene	1	NA	NA	NA	0.0%	< 0.1	104%	70%	130%	NA	100%	100%	NA	60%	140%
Anthracene	1	NA	NA	NA	0.0%	< 0.1	102%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(a)anthracene	1	NA	NA	NA	0.0%	< 0.1	103%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(a)pyrene	1	NA	NA	NA	0.0%	< 0.1	93%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(e)pyrene	1	NA	NA	NA	0.0%	< 0.1	100%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo (b+j+k) fluoranthene	1	NA	NA	NA	0.0%	< 0.1	93%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(c)phenanthrene	1	NA	NA	NA	0.0%	< 0.1	103%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(g,h,i)perylene	1	NA	NA	NA	0.0%	< 0.1	83%	70%	130%	NA	100%	100%	NA	60%	140%
Chrysene	1	NA	NA	NA	0.0%	< 0.1	98%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,h)anthracene	1	NA	NA	NA	0.0%	< 0.1	73%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,i)pyrene	1	NA	NA	NA	0.0%	< 0.1	115%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,h)pyrene	1	NA	NA	NA	0.0%	< 0.1	100%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,l)pyrene	1	NA	NA	NA	0.0%	< 0.1	117%	70%	130%	NA	100%	100%	NA	60%	140%
Dimethyl-7,12 benzo(a)anthracene	1	NA	NA	NA	0.0%	< 0.1	100%	70%	130%	NA	100%	100%	NA	60%	140%
Fluoranthene	1	NA	NA	NA	0.0%	< 0.1	106%	70%	130%	NA	100%	100%	NA	60%	140%
Fluorene	1	NA	NA	NA	0.0%	< 0.1	103%	70%	130%	NA	100%	100%	NA	60%	140%
Indeno(1,2,3-cd)pyrene	1	NA	NA	NA	0.0%	< 0.1	87%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-3 cholanthrene	1	NA	NA	NA	0.0%	< 0.1	81%	70%	130%	NA	100%	100%	NA	60%	140%
Naphthalene	1	NA	NA	NA	0.0%	< 0.1	97%	70%	130%	NA	100%	100%	NA	60%	140%
Phenanthrene	1	NA	NA	NA	0.0%	< 0.1	98%	70%	130%	NA	100%	100%	NA	60%	140%
Pyrene	1	NA	NA	NA	0.0%	< 0.1	100%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-1 naphthalene	1	NA	NA	NA	0.0%	< 0.1	102%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-2 naphthalene	1	NA	NA	NA	0.0%	< 0.1	100%	70%	130%	NA	100%	100%	NA	60%	140%
Dimethyl-1,3 naphthalene	1	NA	NA	NA	0.0%	< 0.1	106%	70%	130%	NA	100%	100%	NA	60%	140%
Trimethyl-2,3,5 naphthalene	1	NA	NA	NA	0.0%	< 0.1	99%	70%	130%	NA	100%	100%	NA	60%	140%
Acenaphtene-d10	1	NA	NA	NA	0.0%	93	120%	40%	140%	NA	100%	100%	NA	40%	140%
Benzo(a)anthracene-d12	1	NA	NA	NA	0.0%	95	123%	40%	140%	NA	100%	100%	NA	40%	140%
Pyrene-d10	1	NA	NA	NA	0.0%	90	120%	40%	140%	NA	100%	100%	NA	40%	140%

Certified By:



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AGAT QUALITY ASSURANCE REPORT

Page 14 of 16

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Method Summary

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

PROJECT: 2499-00

SAMPLED BY: A.T.

AGAT WORK ORDER: 13Q724970

ATTENTION TO: Frederic Lortie

SAMPLING SITE: Manège militaire

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis					
Silver	2013-06-18	2013-06-18	MET-161-6106F, 6108F	MA. 200 - Mét 1.2R2	ICP/MS
Arsenic	2013-06-14	2013-06-18	MET-161-6107F	EPA 3050, EPA 6020	ICP-MS
Cadmium	2013-06-14	2013-06-14	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Chromium	2013-06-14	2013-06-14	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Barium	2013-06-14	2013-06-14	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Copper	2013-06-14	2013-06-14	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Tin	2013-06-14	2013-06-14	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Mercury	2013-06-13	2013-06-13	MET-161-6107F	EPA 245.5	FIMS
Cobalt	2013-06-14	2013-06-14	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Nickel	2013-06-14	2013-06-14	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Lead	2013-06-14	2013-06-14	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Manganese	2013-06-14	2013-06-14	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Zinc	2013-06-14	2013-06-14	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Molybdenum	2013-06-14	2013-06-14	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Selenium	2013-06-18	2013-06-18	MET-161-6106F	EPA 3050, EPA 6020	ICP-MS
Total Sulphur	2013-06-13	2013-06-13	INOR-101-6056F	MA.310-CS	COMBUSTION

Method Summary

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC
PROJECT: 2499-00
SAMPLED BY: A.T.
AGAT WORK ORDER: 13Q724970
ATTENTION TO: Frederic Lortie
SAMPLING SITE: Manège militaire

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis					
Acenaphthene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphthylene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Anthracene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)pyrene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(e)pyrene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo (b+j+k) fluoranthene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(c)phenanthrene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(g,h,i)perylene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Chrysene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)anthracene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,i)pyrene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)pyrene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,l)pyrene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-7,12 benzo(a)anthracene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluoranthene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluorene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Indeno(1,2,3-cd)pyrene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-3 cholanthrene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Naphthalene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Phenanthrene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-1 naphthalene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-2 naphthalene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-1,3 naphthalene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Trimethyl-2,3,5 naphthalene	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphthene-d10	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene-d12	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene-d10	2013-06-14	2013-06-14	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Petroleum Hydrocarbons C10-C50	2013-06-14	2013-06-14	ORG-160-5100F	MEF 410 - HYD. 1.0	GC/FID
Nonane	2013-06-14	2013-06-14	PA-S-HCP	MA. 400 - HYD 1.0	GC/FID

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC
2320, RUE DE CELLES
QUEBEC, QC G2C1X8
(418) 845-0858

ATTENTION TO: Alexandre Tessier

PROJECT: 2499-01

AGAT WORK ORDER: 13Q788174

SOIL ANALYSIS REVIEWED BY: Christian Robert, Chimiste

TRACE ORGANICS REVIEWED BY: Francois Boutin, Chimiste

DATE REPORTED: 2014-02-17

VERSION*: 2

PAGES (INCLUDING COVER): 17

Should you require any information regarding this analysis please contact your client services representative at (418) 266-5511

***NOTES**

VERSION 2: English version.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Certificate of Analysis

AGAT WORK ORDER: 13Q788174

PROJECT: 2499-01

350, rue Franquet
Québec, Québec
CANADA G1P 4P3
TEL (418)266-5511
FAX (418)653-2335
http://www.agatlabs.com

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY: J. Bond

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

Metals (soil)											
DATE RECEIVED: 2013-11-28						DATE REPORTED: 2014-02-17					
		SAMPLE DESCRIPTION:					PE-13 1VR	PE-10 3VR	PE-11 2VR	PE-11 3VR	PE-12 2VR
		SAMPLE TYPE:					Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:					2013-11-26	2013-11-26	2013-11-26	2013-11-26	2013-11-26
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	5004654	5004789	5004793	5004798	5004850
Arsenic	mg/kg	6	30	50	250	5	<5[<A]	15[A-B]	<5[<A]	11[A-B]	<5[<A]
Silver	mg/kg	2	20	40	200	0.5	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]
Cadmium	mg/kg	1.5	5	20	100	0.9	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]
Barium	mg/kg	200	500	2000	10000	20	73[<A]	749[B-C]	<20[<A]	722[B-C]	<20[<A]
Chromium	mg/kg	85	250	800	4000	45	<45[<A]	<45[<A]	<45[<A]	<45[<A]	<45[<A]
Copper	mg/kg	40	100	500	2500	40	<40[<A]	<40[<A]	<40[<A]	<40[<A]	<40[<A]
Tin	mg/kg	5	50	300	1500	5	<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]
Cobalt	mg/kg	15	50	300	1500	15	<15[<A]	16[A-B]	<15[<A]	<15[<A]	<15[<A]
Mercury	mg/kg	0.2	2	10	50	0.2	<0.2[<A]	<0.2[<A]	<0.2[<A]	<0.2[<A]	<0.2[<A]
Nickel	mg/kg	50	100	500	2500	30	<30[<A]	<30[<A]	<30[<A]	<30[<A]	<30[<A]
Lead	mg/kg	50	500	1000	5000	30	<30[<A]	68[A-B]	<30[<A]	91[A-B]	<30[<A]
Manganese	mg/kg	770	1000	2200	11000	10	169[<A]	608[<A]	67[<A]	190[<A]	67[<A]
Zinc	mg/kg	110	500	1500	7500	100	<100[<A]	116[A-B]	<100[<A]	<100[<A]	<100[<A]
Molybdenum	mg/kg	2	10	40	200	2	<2[<A]	3[A-B]	<2[<A]	<2[<A]	<2[<A]
Selenium	mg/kg	1	3	10	50	1.0	<1.0[<A]	<1.0[<A]	<1.0[<A]	<1.0[<A]	<1.0[<A]

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AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13Q788174

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY: J. Bond

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

Metals (soil)											
DATE RECEIVED: 2013-11-28						DATE REPORTED: 2014-02-17					
SAMPLE DESCRIPTION:						PE-12 3VR	PE-13 3VR	PE-14 3VR	PE-15 3VR	PE-16 1VR	
SAMPLE TYPE:						Soil	Soil	Soil	Soil	Soil	
DATE SAMPLED:						2013-11-26	2013-11-26	2013-11-26	2013-11-26	2013-11-26	
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	5004851	5004852	5004853	5004854	5004855
Arsenic	mg/kg	6	30	50	250	5	54[C-D]	12[A-B]	51[C-D]	6[A]	7[A-B]
Silver	mg/kg	2	20	40		0.5	0.6	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]
Cadmium	mg/kg	1.5	5	20	100	0.9	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]
Barium	mg/kg	200	500	2000		20	>2000	660[B-C]	971[B-C]	221[A-B]	265[A-B]
Chromium	mg/kg	85	250	800	4000	45	<45[<A]	<45[<A]	<45[<A]	<45[<A]	<45[<A]
Copper	mg/kg	40	100	500	2500	40	<40[<A]	<40[<A]	<40[<A]	<40[<A]	<40[<A]
Tin	mg/kg	5	50	300	1500	5	<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]
Cobalt	mg/kg	15	50	300		15	21	<15[<A]	18[A-B]	<15[<A]	<15[<A]
Mercury	mg/kg	0.2	2	10	50	0.2	0.2[A]	<0.2[<A]	<0.2[<A]	<0.2[<A]	<0.2[<A]
Nickel	mg/kg	50	100	500	2500	30	50[A]	<30[<A]	38[<A]	<30[<A]	<30[<A]
Lead	mg/kg	50	500	1000	5000	30	<30[<A]	84[A-B]	<30[<A]	51[A-B]	<30[<A]
Manganese	mg/kg	770	1000	2200		10	523	197[<A]	301[<A]	165[<A]	164[<A]
Zinc	mg/kg	110	500	1500	7500	100	115[A-B]	134[A-B]	<100[<A]	<100[<A]	<100[<A]
Molybdenum	mg/kg	2	10	40		2	5	<2[<A]	6[A-B]	<2[<A]	<2[<A]
Selenium	mg/kg	1	3	10		1.0	1.9	<1.0[<A]	1.3[A-B]	<1.0[<A]	<1.0[<A]

Certified By:

Christian Robert



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AGAT CERTIFICATE OF ANALYSIS

Page 3 of 17

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Certificate of Analysis

AGAT WORK ORDER: 13Q788174

PROJECT: 2499-01

350, rue Franquet
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FAX (418)653-2335
http://www.agatlabs.com

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY: J. Bond

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

Metals (soil)								
DATE RECEIVED: 2013-11-28					DATE REPORTED: 2014-02-17			
		SAMPLE DESCRIPTION:					PE-16 4VR	PE-17 3VR
		SAMPLE TYPE:					Soil	Soil
		DATE SAMPLED:					2013-11-26	2013-11-26
Parameter	Unit	G / S : A	G / S : B	G / S : C	G / S : D	RDL	5004856	5004857
Arsenic	mg/kg	6	30	50	250	5	46[B-C]	22[A-B]
Silver	mg/kg	2	20	40	200	0.5	<0.5[<A]	0.6[<A]
Cadmium	mg/kg	1.5	5	20	100	0.9	<0.9[<A]	<0.9[<A]
Barium	mg/kg	200	500	2000	10000	20	1510[B-C]	814[B-C]
Chromium	mg/kg	85	250	800	4000	45	<45[<A]	<45[<A]
Copper	mg/kg	40	100	500	2500	40	46[A-B]	89[A-B]
Tin	mg/kg	5	50	300	1500	5	<5[<A]	12[A-B]
Cobalt	mg/kg	15	50	300	1500	15	22[A-B]	<15[<A]
Mercury	mg/kg	0.2	2	10	50	0.2	0.2[A]	1.3[A-B]
Nickel	mg/kg	50	100	500	2500	30	84[A-B]	30[<A]
Lead	mg/kg	50	500	1000	5000	30	93[A-B]	321[A-B]
Manganese	mg/kg	770	1000	2200	11000	10	414[<A]	414[<A]
Zinc	mg/kg	110	500	1500	7500	100	180[A-B]	256[A-B]
Molybdenum	mg/kg	2	10	40	200	2	10[B]	3[A-B]
Selenium	mg/kg	1	3	10	50	1.0	2.2[A-B]	1.7[A-B]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

5004851 Silver: Results of samples can be overstated due to the recovery of white fortified. Barium: The result of analysis is beyond the linear range. The analysis can not be reversed because the sample is no longer available.

5004857 Silver: Results of samples can be overstated due to the recovery of white fortified.

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AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13Q788174

PROJECT: 2499-01

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY: J. Bond

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

Total sulfur (soil)						
DATE RECEIVED: 2013-11-28				DATE REPORTED: 2014-02-17		
				SAMPLE DESCRIPTION: PE-11 3VR		
				SAMPLE TYPE: Soil		
				DATE SAMPLED: 2013-11-26		
Parameter	Unit	G / S: A	G / S: B	G / S: C	RDL	5004796
Total Sulphur	mg/kg	400	1000	2000	400	1400[B-C]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C)
5004796 Analysis in performed by subcontractor.

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Christian Robert



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AGAT CERTIFICATE OF ANALYSIS

Page 5 of 17

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Certificate of Analysis

AGAT WORK ORDER: 13Q788174

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

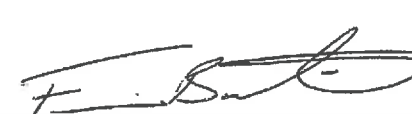

SAMPLED BY: J. Bond

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

PAHs (Soil)										
DATE RECEIVED: 2013-11-28							DATE REPORTED: 2014-02-17			
Parameter	Unit	SAMPLE DESCRIPTION:					PE-13 1VR	PE-10 3VR	PE-11 2VR	PE-11 3VR
		SAMPLE TYPE:					Soil	Soil	Soil	Soil
G / S: A	G / S: B	G / S: C	G / S: D	RDL	DATE SAMPLED:					
					2013-11-26	2013-11-26	2013-11-26	2013-11-26	2013-11-26	2013-11-26
					5004654	5004789	5004793	5004796	5004850	
Acenaphthene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Acenaphthylene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Anthracene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(a)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(e)pyrene	mg/kg					0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+j+k)fluoranthene	mg/kg	0.1	1	10	136	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(c)phenanthrene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(g,h,i)perylene	mg/kg	0.1	1	10	18	0.1	<0.1[<A]	<0.1[<A]	0.1[A]	<0.1[<A]
Chrysene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)anthracene	mg/kg	0.1	1	10	82	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-7,12 benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Fluoranthene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	0.1[A]	<0.1[<A]
Fluorene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Methyl-3 cholanthrene	mg/kg	0.1	1	10	150	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Naphthalene	mg/kg	0.1	5	50	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Phenanthrene	mg/kg	0.1	5	50	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Pyrene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	0.1[A]	<0.1[<A]
Methyl-1 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Methyl-2 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-1,3 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Trimethyl-2,3,5 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]

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Certificate of Analysis

AGAT WORK ORDER: 13Q788174

PROJECT: 2499-01

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY: J. Bond

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

PAHs (Soil)								
DATE RECEIVED: 2013-11-28				DATE REPORTED: 2014-02-17				
			SAMPLE DESCRIPTION:	PE-13 1VR	PE-10 3VR	PE-11 2VR	PE-11 3VR	PE-12 2VR
			SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
			DATE SAMPLED:	2013-11-26	2013-11-26	2013-11-26	2013-11-26	2013-11-26
				5004654	5004789	5004793	5004796	5004850
Surrogate	Unit	Acceptable Limits						
Acenaphthene-d10	%	40-140		91	88	91	95	91
Benzo(a)anthracene-d12	%	40-140		97	91	95	99	92
Pyrene-d10	%	40-140		93	89	92	95	91

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Certificate of Analysis

AGAT WORK ORDER: 13Q788174

PROJECT: 2499-01

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

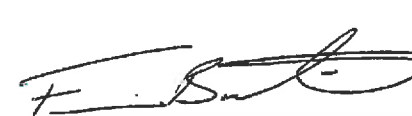

SAMPLED BY: J. Bond

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

PAHs (Soil)											
DATE RECEIVED: 2013-11-28							DATE REPORTED: 2014-02-17				
Parameter	Unit	SAMPLE DESCRIPTION:					PE-12 3VR	PE-13 3VR	PE-14 3VR	PE-15 3VR	PE-16 1VR
		SAMPLE TYPE:					Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:					2013-11-26	2013-11-26	2013-11-26	2013-11-26	2013-11-26
		G / S : A	G / S : B	G / S : C	G / S : D	RDL	5004851	5004852	5004853	5004854	5004855
Acenaphthene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Acenaphthylene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Anthracene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	0.2[A-B]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(a)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	0.2[A-B]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(e)pyrene	mg/kg					0.1	<0.1	0.1	<0.1	0.1	<0.1
Benzo (b+j+k) fluoranthene	mg/kg	0.1	1	10	136	0.1	<0.1[<A]	0.3[A-B]	<0.1[<A]	0.2[A-B]	<0.1[<A]
Benzo(c)phenanthrene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(g,h,i)perylene	mg/kg	0.1	1	10	18	0.1	<0.1[<A]	0.1[A]	<0.1[<A]	0.1[A]	<0.1[<A]
Chrysene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	0.2[A-B]	<0.1[<A]	0.1[A]	<0.1[<A]
Dibenzo(a,h)anthracene	mg/kg	0.1	1	10	82	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-7,12 benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Fluoranthene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	0.3[A-B]	<0.1[<A]	0.1[A]	<0.1[<A]
Fluorene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	0.1[A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Methyl-3 cholanthrene	mg/kg	0.1	1	10	150	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Naphthalene	mg/kg	0.1	5	50	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Phenanthrene	mg/kg	0.1	5	50	56	0.1	<0.1[<A]	0.2[A-B]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Pyrene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	0.3[A-B]	<0.1[<A]	0.1[A]	<0.1[<A]
Methyl-1 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Methyl-2 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-1,3 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Trimethyl-2,3,5 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]

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Certificate of Analysis

AGAT WORK ORDER: 13Q788174

PROJECT: 2499-01

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY: J. Bond

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

PAHs (Soil)						
DATE RECEIVED: 2013-11-28			DATE REPORTED: 2014-02-17			
			SAMPLE DESCRIPTION:	PE-12 3VR	PE-13 3VR	PE-14 3VR
			SAMPLE TYPE:	Soil	Soil	Soil
			DATE SAMPLED:	2013-11-26	2013-11-26	2013-11-26
				5004851	5004852	5004853
Surrogate	Unit	Acceptable Limits				
Acenaphtene-d10	%	40-140		86	89	92
Benzo(a)anthracene-d12	%	40-140		88	92	94
Pyrene-d10	%	40-140		86	89	92

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AGAT CERTIFICATE OF ANALYSIS

Page 9 of 17

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Certificate of Analysis

AGAT WORK ORDER: 13Q788174

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

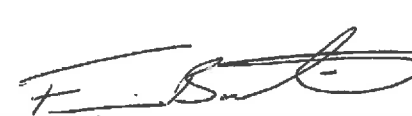

SAMPLED BY: J. Bond

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

PAHs (Soil)									
DATE RECEIVED: 2013-11-28						DATE REPORTED: 2014-02-17			
Parameter	Unit	SAMPLE DESCRIPTION:					PE-16 4VR	PE-17 3VR	PE-15 3VR DUP
		G / S: A	G / S: B	G / S: C	G / S: D	SAMPLE TYPE:	Soil	Soil	Soil
						DATE SAMPLED:	2013-11-26	2013-11-26	2013-11-26
						RDL	5004856	5004857	5004860
Acenaphtene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	0.2[A-B]	<0.1[<A]
Acenaphtylene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	0.1[A]	<0.1[<A]
Anthracene	mg/kg	0.1	10	100	100	0.1	0.1[A]	0.4[A-B]	<0.1[<A]
Benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	0.4[A-B]	0.9[A-B]	<0.1[<A]
Benzo(a)pyrene	mg/kg	0.1	1	10	34	0.1	0.4[A-B]	0.7[A-B]	<0.1[<A]
Benzo(e)pyrene	mg/kg					0.1	0.3	0.5	0.1
Benzo (b+j+k) fluoranthene	mg/kg	0.1	1	10	136	0.1	0.6[A-B]	1.2[B-C]	0.1[A]
Benzo(c)phenanthrene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	0.1[A]	<0.1[<A]
Benzo(g,h,i)perylene	mg/kg	0.1	1	10	18	0.1	0.2[A-B]	0.4[A-B]	0.1[A]
Chrysene	mg/kg	0.1	1	10	34	0.1	0.4[A-B]	0.8[A-B]	<0.1[<A]
Dibenzo(a,h)anthracene	mg/kg	0.1	1	10	82	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	0.1[A]	<0.1[<A]
Dimethyl-7,12 benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Fluoranthene	mg/kg	0.1	10	100	100	0.1	0.8[A-B]	1.8[A-B]	<0.1[<A]
Fluorene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	0.2[A-B]	<0.1[<A]
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	34	0.1	0.3[A-B]	0.5[A-B]	<0.1[<A]
Methyl-3 cholanthrene	mg/kg	0.1	1	10	150	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Naphthalene	mg/kg	0.1	5	50	56	0.1	<0.1[<A]	0.1[A]	<0.1[<A]
Phenanthrene	mg/kg	0.1	5	50	56	0.1	0.6[A-B]	1.5[A-B]	<0.1[<A]
Pyrene	mg/kg	0.1	10	100	100	0.1	0.7[A-B]	1.4[A-B]	<0.1[<A]
Methyl-1 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Methyl-2 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-1,3 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]
Trimethyl-2,3,5 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]

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Certificate of Analysis

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY: J. Bond

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

PAHs (Soil)					
DATE RECEIVED: 2013-11-28			DATE REPORTED: 2014-02-17		
		SAMPLE DESCRIPTION:	PE-16 4VR	PE-17 3VR	PE-15 3VR DUP
		SAMPLE TYPE:	Soil	Soil	Soil
		DATE SAMPLED:	2013-11-26	2013-11-26	2013-11-26
			5004856	5004857	5004860
Surrogate	Unit	Acceptable Limits			
Acenaphthene-d10	%	40-140	88	90	90
Benzo(a)anthracene-d12	%	40-140	88	91	91
Pyrene-d10	%	40-140	86	88	89

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY: J. Bond

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

Petroleum Hydrocarbons C10-C50 (Soil)

DATE RECEIVED: 2013-11-28

DATE REPORTED: 2014-02-17

						SAMPLE DESCRIPTION:	PE-13 1VR	PE-10 3VR	PE-11 2VR	PE-11 3VR	PE-12 2VR
						SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
						DATE SAMPLED:	2013-11-26	2013-11-26	2013-11-26	2013-11-26	2013-11-26
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	5004654	5004789	5004793	5004796	5004850
Petroleum Hydrocarbons C10-C50	mg/kg	300	700	3500	10000	100	<100[<A]	<100[<A]	<100[<A]	125[<A]	<100[<A]
Surrogate	Unit	Acceptable Limits									
Nonane	%			40-140			43	95	111	75	96
						SAMPLE DESCRIPTION:	PE-12 3VR	PE-16 1VR	PE-16 4VR	PE-17 3VR	PE-11 3VR DUP
						SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
						DATE SAMPLED:	2013-11-26	2013-11-26	2013-11-26	2013-11-26	2013-11-26
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	5004851	5004855	5004856	5004857	5004858
Petroleum Hydrocarbons C10-C50	mg/kg	300	700	3500	10000	100	<100[<A]	275[<A]	<100[<A]	<100[<A]	149[<A]
Surrogate	Unit	Acceptable Limits									
Nonane	%			40-140			103	99	107	107	102

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

Certified By:



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Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

PROJECT: 2499-01

SAMPLED BY: J. Bond

AGAT WORK ORDER: 13Q788174

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

Soil Analysis

RPT Date: 2014-02-17			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Metals (soil)															
Arsenic	5004850	5004850	< 5	< 5	0.0%	< 5	NA	80%	120%	113%	80%	120%	118%	70%	130%
Cadmium	5004850	5004850	<0.9	<0.9	NR	< 0.9	NA	80%	120%	105%	80%	120%	95%	70%	130%
Chromium	5004850	5004850	<45	<45	NR	< 45	NA	80%	120%	100%	80%	120%	91%	70%	130%
Copper	5004850	5004850	<40	<40	NR	< 40	NA	80%	120%	103%	80%	120%	99%	70%	130%
Tin	5004850	5004850	< 5	< 5	0.0%	< 5	NA	80%	120%	103%	80%	120%	115%	70%	130%
Mercury	4997199		< 0.2	< 0.2	0.0%	< 0.2	88%	80%	120%	NA	80%	120%	112%	70%	130%
Nickel	5004850	5004850	<30	<30	NR	< 30	NA	80%	120%	102%	80%	120%	91%	70%	130%
Lead	5004850	5004850	<30	<30	NR	< 30	NA	80%	120%	98%	80%	120%	90%	70%	130%
Zinc	5004850	5004850	<100	<100	NR	< 100	NA	80%	120%	102%	80%	120%	91%	70%	130%
Metals (soil)															
Silver		5004850	< 0.5	< 0.5	0.0%	< 0.5	NA	80%	120%	121%	80%	120%	108%	70%	130%
Barium		NA	NA	NA	0.0%	< 20	NA	80%	120%	98%	80%	120%	NA	70%	130%
Cobalt		NA	NA	NA	0.0%	< 15	NA	80%	120%	98%	80%	120%	NA	70%	130%
Manganese		NA	NA	NA	0.0%	< 10	NA	80%	120%	100%	80%	120%	NA	70%	130%
Molybdenum		NA	NA	NA	0.0%	< 2	NA	80%	120%	105%	80%	120%	NA	70%	130%
Selenium		5004850	< 1.0	< 1.0	0.0%	< 1.0	NA	80%	120%	115%	80%	120%	120%	70%	130%

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Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

AGAT WORK ORDER: 13Q788174

PROJECT: 2499-01

ATTENTION TO: Alexandre Tessier

SAMPLED BY: J. Bond

SAMPLING SITE: Manège militaire de Québec

Trace Organics Analysis

RPT Date: 2014-02-17			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
PAHs (Soil)															
Acenaphtene	1	NA	NA	NA	0.0%	< 0.1	103%	70%	130%	NA	100%	100%	NA	60%	140%
Acenaphtylene	1	NA	NA	NA	0.0%	< 0.1	103%	70%	130%	NA	100%	100%	NA	60%	140%
Anthracene	1	NA	NA	NA	0.0%	< 0.1	97%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(a)anthracene	1	NA	NA	NA	0.0%	< 0.1	96%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(a)pyrene	1	NA	NA	NA	0.0%	< 0.1	112%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(e)pyrene	1	NA	NA	NA	0.0%	< 0.1	100%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo (b+j+k) fluoranthene	1	NA	NA	NA	0.0%	< 0.1	88%	70%	130%	NA	100%	100%	NA	60%	140%
Benzo(c)phenanthrene	1	NA	NA	NA	0.0%	< 0.1	99%	70%	130%	NA	100%	100%	NA	80%	140%
Benzo(g,h,i)perylene	1	NA	NA	NA	0.0%	< 0.1	89%	70%	130%	NA	100%	100%	NA	60%	140%
Chrysene	1	NA	NA	NA	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,h)anthracene	1	NA	NA	NA	0.0%	< 0.1	72%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,i)pyrene	1	NA	NA	NA	0.0%	< 0.1	59%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,h)pyrene	1	NA	NA	NA	0.0%	< 0.1	79%	70%	130%	NA	100%	100%	NA	60%	140%
Dibenzo(a,l)pyrene	1	NA	NA	NA	0.0%	< 0.1	87%	70%	130%	NA	100%	100%	NA	60%	140%
Dimethyl-7,12 benzo(a)anthracene	1	NA	NA	NA	0.0%	< 0.1	117%	70%	130%	NA	100%	100%	NA	60%	140%
Fluoranthene	1	NA	NA	NA	0.0%	< 0.1	99%	70%	130%	NA	100%	100%	NA	60%	140%
Fluorene	1	NA	NA	NA	0.0%	< 0.1	101%	70%	130%	NA	100%	100%	NA	60%	140%
Indeno(1,2,3-cd)pyrene	1	NA	NA	NA	0.0%	< 0.1	85%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-3 cholanthrene	1	NA	NA	NA	0.0%	< 0.1	86%	70%	130%	NA	100%	100%	NA	60%	140%
Naphthalene	1	NA	NA	NA	0.0%	< 0.1	96%	70%	130%	NA	100%	100%	NA	60%	140%
Phenanthrene	1	NA	NA	NA	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	NA	60%	140%
Pyrene	1	NA	NA	NA	0.0%	< 0.1	98%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-1 naphthalene	1	NA	NA	NA	0.0%	< 0.1	93%	70%	130%	NA	100%	100%	NA	60%	140%
Methyl-2 naphthalene	1	NA	NA	NA	0.0%	< 0.1	101%	70%	130%	NA	100%	100%	NA	60%	140%
Dimethyl-1,3 naphthalene	1	NA	NA	NA	0.0%	< 0.1	96%	70%	130%	NA	100%	100%	NA	60%	140%
Trimethyl-2,3,5 naphthalene	1	NA	NA	NA	0.0%	< 0.1	111%	70%	130%	NA	100%	100%	NA	60%	140%
Acenaphtene-d10	1	NA	NA	NA	0.0%	89	87%	40%	140%	NA	100%	100%	NA	40%	140%
Benzo(a)anthracene-d12	1	NA	NA	NA	0.0%	93	95%	40%	140%	NA	100%	100%	NA	40%	140%
Pyrene-d10	1	NA	NA	NA	0.0%	89	88%	40%	140%	NA	100%	100%	NA	40%	140%
Petroleum Hydrocarbons C10-C50 (Soil)															
Petroleum Hydrocarbons C10-C50	1	NA	NA	NA	0.0%	< 100	126%	70%	130%	NA	100%	100%	NA	60%	140%
Nonane	1	NA	NA	NA	0.0%	110	123%	40%	140%	NA	100%	100%	NA	40%	140%

PAHs (Soil)															
Acenaphtene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	93%	70%	130%	NA	100%	100%	95%	60%	140%
Acenaphtylene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	97%	60%	140%
Anthracene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	91%	70%	130%	NA	100%	100%	93%	60%	140%
Benzo(a)anthracene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	93%	70%	130%	NA	100%	100%	94%	60%	140%
Benzo(a)pyrene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	90%	70%	130%	NA	100%	100%	92%	60%	140%
Benzo(e)pyrene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	95%	70%	130%	NA	100%	100%	98%	60%	140%
Benzo (b+j+k) fluoranthene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	97%	60%	140%
Benzo(c)phenanthrene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	92%	70%	130%	NA	100%	100%	94%	60%	140%

Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

PROJECT: 2499-01

SAMPLED BY: J. Bond

AGAT WORK ORDER: 13Q788174

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

Trace Organics Analysis (Continued)

RPT Date: 2014-02-17			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Benzo(g,h,i)perylene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	97%	70%	130%	NA	100%	100%	100%	60%	140%
Chrysene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	90%	70%	130%	NA	100%	100%	94%	60%	140%
Dibenzo(a,h)anthracene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	96%	70%	130%	NA	100%	100%	99%	60%	140%
Dibenzo(a,i)pyrene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	83%	70%	130%	NA	100%	100%	88%	60%	140%
Dibenzo(a,h)pyrene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	92%	70%	130%	NA	100%	100%	103%	60%	140%
Dibenzo(a,l)pyrene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	115%	70%	130%	NA	100%	100%	122%	60%	140%
Dimethyl-7,12 benzo(a)anthracene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	109%	70%	130%	NA	100%	100%	108%	60%	140%
Fluoranthene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	91%	70%	130%	NA	100%	100%	93%	60%	140%
Fluorene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	92%	70%	130%	NA	100%	100%	94%	60%	140%
Indeno(1,2,3-cd)pyrene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	86%	70%	130%	NA	100%	100%	142%	60%	140%
Methyl-3 cholanthrene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	102%	70%	130%	NA	100%	100%	108%	60%	140%
Naphthalene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	92%	70%	130%	NA	100%	100%	94%	60%	140%
Phenanthrene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	93%	70%	130%	NA	100%	100%	95%	60%	140%
Pyrene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	93%	70%	130%	NA	100%	100%	96%	60%	140%
Methyl-1 naphthalene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	87%	70%	130%	NA	100%	100%	91%	60%	140%
Methyl-2 naphthalene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	96%	70%	130%	NA	100%	100%	98%	60%	140%
Dimethyl-1,3 naphthalene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	88%	70%	130%	NA	100%	100%	90%	60%	140%
Trimethyl-2,3,5 naphthalene	1	5004850	< 0.1	< 0.1	0.0%	< 0.1	110%	70%	130%	NA	100%	100%	113%	60%	140%
Acenaphtene-d10	1	5004850	91	89	2.2%	89	93%	40%	140%	NA	100%	100%	89%	40%	140%
Benzo(a)anthracene-d12	1	5004850	92	91	1.1%	92	97%	40%	140%	NA	100%	100%	91%	40%	140%
Pyrene-d10	1	5004850	91	88	3.4%	89	94%	40%	140%	NA	100%	100%	88%	40%	140%
Petroleum Hydrocarbons C10-C50 (Soil)															
Petroleum Hydrocarbons C10-C50	1	5004850	< 100	< 100	0.0%	< 100	99%	70%	130%	NA	100%	100%	133%	60%	140%
Nonane	1	5004850	96	94	2.1%	96	94%	40%	140%	NA	100%	100%	88%	40%	140%

Certified By:




AGAT Laboratories' procedure for signatures and signatories adheres strictly to the requirements of accreditation ISO 17025:2005 as required by CALA, SCC and MDDEP where applicable. All electronic signatures on AGAT certificates are password protected and all signatories meet their regional and scope of accreditation requirements and are approved by CALA, SCC and MDDEP.

Method Summary

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

PROJECT: 2499-01

SAMPLED BY: J. Bond

AGAT WORK ORDER: 13Q788174

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis					
Arsenic	2013-12-02	2013-12-02	MET-161-6107F	EPA 3050, EPA 6020	ICP-MS
Silver	2013-12-02	2013-12-02	MET-161-6106F, 6108F	MA. 200 - Mét 1.2R2	ICP/MS
Cadmium	2013-12-02	2013-12-02	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Barium	2013-12-02	2013-12-02	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Chromium	2013-12-02	2013-12-02	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Copper	2013-12-02	2013-12-02	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Tin	2013-12-02	2013-12-02	MET-161-6106F, 6108F	MA. 200 - Mét 1.2R2	ICP/MS
Mercury	2013-12-02	2013-12-02	MET-161-6107F	EPA 245.5	FIMS
Cobalt	2013-12-02	2013-12-02	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Nickel	2013-12-02	2013-12-02	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Lead	2013-12-02	2013-12-02	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Zinc	2013-12-02	2013-12-02	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Manganese	2013-12-02	2013-12-02	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Molybdenum	2013-12-02	2013-12-02	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Selenium	2013-12-02	2013-12-02	MET-161-6106F	EPA 3050, EPA 6020	ICP-MS
Total Sulphur	2013-12-02	2013-12-02	INOR-101-6056F	MA.310-CS	COMBUSTION

Method Summary

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

PROJECT: 2499-01

SAMPLED BY: J. Bond

AGAT WORK ORDER: 13Q788174

ATTENTION TO: Alexandre Tessier

SAMPLING SITE: Manège militaire de Québec

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis					
Acenaphthene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphthylene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Anthracene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)pyrene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(e)pyrene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo (b+j+k) fluoranthene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(c)phenanthrene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(g,h,i)perylene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Chrysene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)anthracene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,i)pyrene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)pyrene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,l)pyrene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-7,12 benzo(a)anthracene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluoranthene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluorene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Indeno(1,2,3-cd)pyrene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-3 cholanthrene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Naphthalene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Phenanthrene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-1 naphthalene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-2 naphthalene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-1,3 naphthalene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Trimethyl-2,3,5 naphthalene	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphthene-d10	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene-d12	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene-d10	2013-12-03	2013-12-04	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Petroleum Hydrocarbons C10-C50	2013-11-29	2013-12-03	ORG-160-5100F	MEF 410 - HYD. 1.0	GC/FID
Nonane	2013-11-29	2013-12-03	PA-S-HCP	MA. 400 - HYD 1.0	GC/FID

**CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC
2320, RUE DE CELLES
QUEBEC, QC G2C1X8
(418) 845-0858**

ATTENTION TO: Frederic Lortie

PROJECT: 2499-01

AGAT WORK ORDER: 13Q791963

SOIL ANALYSIS REVIEWED BY: Francois Boutin, Chimiste

TRACE ORGANICS REVIEWED BY: Francois Boutin, Chimiste

DATE REPORTED: 2014-02-17

VERSION*: 2

PAGES (INCLUDING COVER): 15

Should you require any information regarding this analysis please contact your client services representative at (418) 266-5511

***NOTES**

VERSION 2: English version.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Certificate of Analysis

AGAT WORK ORDER: 13Q791963

PROJECT: 2499-01

350, rue Franquet
Québec, Québec
CANADA G1P 4P3
TEL (418)266-5511
FAX (418)653-2335
<http://www.agatlabs.com>

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

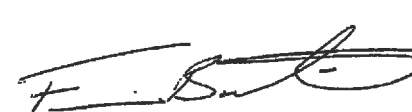

SAMPLED BY: W.C.

ATTENTION TO: Frederic Lortie

SAMPLING SITE: Manège militaire de Qc

Metals (soil)										
DATE RECEIVED: 2013-12-09							DATE REPORTED: 2014-02-17			
		SAMPLE DESCRIPTION:					PE18 1VR	PE19 2VR	PE19 3VR	PE19 3VR DUP
		SAMPLE TYPE:					Soil	Soil	Soil	Soil
		DATE SAMPLED:					2013-12-04	2013-12-04	2013-12-04	2013-12-04
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	5038655	5038660	5038661	5038662
Silver	mg/kg	2	20	40	200	0.5	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]
Barium	mg/kg	200	500	2000	10000	20	67[<A]	<20[<A]	999[B-C]	951[B-C]
Cobalt	mg/kg	15	50	300	1500	15	<15[<A]	<15[<A]	<15[<A]	<15[<A]
Manganese	mg/kg	770	1000	2200	11000	10	202[<A]	114[<A]	399[<A]	385[<A]
Molybdenum	mg/kg	2	10	40	200	2	<2[<A]	<2[<A]	6[A-B]	5[A-B]
Selenium	mg/kg	1	3	10	50	1.0	<1.0[<A]	<1.0[<A]	1.3[A-B]	1.0[A]
		SAMPLE DESCRIPTION:					PE21 1VR	PE22 2VR	PE22 3VR	PE22 4VR
		SAMPLE TYPE:					Soil	Soil	Soil	Soil
		DATE SAMPLED:					2013-12-04	2013-12-05	2013-12-05	2013-12-05
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	5038664	5038665	5038666	5038667
Silver	mg/kg	2	20	40	200	0.5	<0.5[<A]	<0.5[<A]	<0.5[<A]	<0.5[<A]
Barium	mg/kg	200	500	2000	10000	20	1410[B-C]	803[B-C]	45[<A]	761[B-C]
Cobalt	mg/kg	15	50	300	1500	15	<15[<A]	<15[<A]	<15[<A]	<15[<A]
Manganese	mg/kg	770	1000	2200	11000	10	316[<A]	536[<A]	104[<A]	285[<A]
Molybdenum	mg/kg	2	10	40	200	2	3[A-B]	4[A-B]	<2[<A]	3[A-B]
Selenium	mg/kg	1	3	10	50	1.0	<1.0[<A]	1.2[A-B]	<1.0[<A]	1.7[A-B]
		SAMPLE DESCRIPTION:					PE23 3VR	PE23 5VR	PE24 2VR	
		SAMPLE TYPE:					Soil	Soil	Soil	
		DATE SAMPLED:					2013-12-04	2013-12-04	2013-12-05	
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	5038669	5038671	5038672	
Silver	mg/kg	2	20	40	200	0.5	<0.5[<A]	<0.5[<A]	<0.5[<A]	
Barium	mg/kg	200	500	2000	10000	20	919[B-C]	862[B-C]	481[A-B]	
Cobalt	mg/kg	15	50	300	1500	15	24[A-B]	28[A-B]	<15[<A]	
Manganese	mg/kg	770	1000	2200	11000	10	230[<A]	230[<A]	281[<A]	
Molybdenum	mg/kg	2	10	40	200	2	11[B-C]	12[B-C]	<2[<A]	
Selenium	mg/kg	1	3	10	50	1.0	1.6[A-B]	1.4[A-B]	<1.0[<A]	

Certified By:

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AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13Q791963

PROJECT: 2499-01

350, rue Franquet
Québec, Québec
CANADA G1P 4P3
TEL (418)266-5511
FAX (418)653-2335
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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:W.C.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire de Qc

Metals (soil)

DATE RECEIVED: 2013-12-09

DATE REPORTED: 2014-02-17

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC-PTC (A), B Refers to QC-PTC (B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

Certified By:



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AGAT CERTIFICATE OF ANALYSIS

Page 3 of 15

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Certificate of Analysis

AGAT WORK ORDER: 13Q791963

PROJECT: 2499-01

350, rue Franquet
Québec, Québec
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TEL (418)266-5511
FAX (418)653-2335
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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY: W.C.

ATTENTION TO: Frederic Lortie

SAMPLING SITE: Manège militaire de Qc

Total Metals + Hg (Soil)											
DATE RECEIVED: 2013-12-09						DATE REPORTED: 2014-02-17					
		SAMPLE DESCRIPTION:					PE18 1VR	PE19 2VR	PE19 3VR	PE19 3VR DUP	PE20 2VR
		SAMPLE TYPE:					Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:					2013-12-04	2013-12-04	2013-12-04	2013-12-04	2013-12-05
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	5038655	5038660	5038661	5038662	5038663
Arsenic	mg/kg	15	30	50	250	5	<5[<A]	<5[<A]	23[A-B]	23[A-B]	25[A-B]
Cadmium	mg/kg	1.3	5	20	100	0.9	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]
Chromium	mg/kg	75	250	800	4000	45	<45[<A]	<45[<A]	<45[<A]	<45[<A]	<45[<A]
Copper	mg/kg	50	100	500	2500	40	<40[<A]	<40[<A]	43[<A]	42[<A]	118[B-C]
Tin	mg/kg	5	50	300	1500	5	<5[<A]	<5[<A]	21[A-B]	15[A-B]	44[A-B]
Mercury	mg/kg	0.2	2	10	50	0.2	<0.2[<A]	<0.2[<A]	0.7[A-B]	0.6[A-B]	0.4[A-B]
Nickel	mg/kg	55	100	500	2500	30	<30[<A]	<30[<A]	35[<A]	36[<A]	35[<A]
Lead	mg/kg	40	500	1000	5000	30	<30[<A]	<30[<A]	154[A-B]	128[A-B]	296[A-B]
Zinc	mg/kg	130	500	1500	7500	100	<100[<A]	<100[<A]	136[A-B]	132[A-B]	187[A-B]
		SAMPLE DESCRIPTION:					PE21 1VR	PE22 2VR	PE22 3VR	PE22 4VR	PE23 2VR
		SAMPLE TYPE:					Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:					2013-12-04	2013-12-05	2013-12-05	2013-12-05	2013-12-04
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	5038664	5038665	5038666	5038667	5038668
Arsenic	mg/kg	15	30	50	250	5	17[A-B]	18[A-B]	<5[<A]	18[A-B]	<5[<A]
Cadmium	mg/kg	1.3	5	20	100	0.9	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]	<0.9[<A]
Chromium	mg/kg	75	250	800	4000	45	<45[<A]	<45[<A]	<45[<A]	<45[<A]	<45[<A]
Copper	mg/kg	50	100	500	2500	40	<40[<A]	103[B-C]	<40[<A]	70[A-B]	<40[<A]
Tin	mg/kg	5	50	300	1500	5	<5[<A]	360[C-D]	<5[<A]	34[A-B]	<5[<A]
Mercury	mg/kg	0.2	2	10	50	0.2	0.2[A]	2.1[B-C]	<0.2[<A]	0.8[A-B]	0.3[A-B]
Nickel	mg/kg	55	100	500	2500	30	<30[<A]	<30[<A]	<30[<A]	<30[<A]	<30[<A]
Lead	mg/kg	40	500	1000	5000	30	49[A-B]	837[B-C]	<30[<A]	301[A-B]	<30[<A]
Zinc	mg/kg	130	500	1500	7500	100	102[<A]	494[A-B]	<100[<A]	162[A-B]	<100[<A]

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AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13Q791963

PROJECT: 2499-01

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:W.C.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire de Qc

Total Metals + Hg (Soil)									
DATE RECEIVED: 2013-12-09					DATE REPORTED: 2014-02-17				
		SAMPLE DESCRIPTION:					PE23 3VR	PE23 5VR	PE24 2VR
		SAMPLE TYPE:					Soil	Soil	Soil
		DATE SAMPLED:					2013-12-04	2013-12-04	2013-12-05
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	5038669	5038671	5038672
Arsenic	mg/kg	15	30	50	250	5	55[C-D]	52[C-D]	12[<A]
Cadmium	mg/kg	1.3	5	20	100	0.9	0.9[<A]	<0.9[<A]	<0.9[<A]
Chromium	mg/kg	75	250	800	4000	45	<45[<A]	<45[<A]	<45[<A]
Copper	mg/kg	50	100	500	2500	40	79[A-B]	75[A-B]	61[A-B]
Tin	mg/kg	5	50	300	1500	5	<5[<A]	<5[<A]	30[A-B]
Mercury	mg/kg	0.2	2	10	50	0.2	0.2[A]	0.3[A-B]	1.2[A-B]
Nickel	mg/kg	55	100	500	2500	30	67[A-B]	71[A-B]	<30[<A]
Lead	mg/kg	40	500	1000	5000	30	94[A-B]	63[A-B]	261[A-B]
Zinc	mg/kg	130	500	1500	7500	100	199[A-B]	189[A-B]	283[A-B]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC-PTC A Appalaches, B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

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AGAT CERTIFICATE OF ANALYSIS

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Certificate of Analysis

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:W.C.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire de Qc

Total sulfur (soil)				
DATE RECEIVED: 2013-12-09			DATE REPORTED: 2014-02-17	
		SAMPLE DESCRIPTION:	PE20 2VR	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2013-12-05	
Parameter	Unit	G / S	RDL	5038663
Sulphur	% p/p	100	1500	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
5038663 The analysis is performed at Montreal AGAT Location.

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

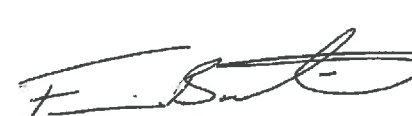

SAMPLED BY: W.C.

ATTENTION TO: Frederic Lortie

SAMPLING SITE: Manège militaire de Qc

PAHs (Soil)											
DATE RECEIVED: 2013-12-09						DATE REPORTED: 2014-02-17					
Parameter	Unit	SAMPLE DESCRIPTION:					PE18 1VR	PE19 2VR	PE19 3VR	PE20 2VR	PE21 1VR
		SAMPLE TYPE:					Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:					2013-12-04	2013-12-04	2013-12-04	2013-12-05	2013-12-04
		G / S: A	G / S: B	G / S: C	G / S: D	RDL	5038655	5038660	5038661	5038663	5038664
Acenaphthene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	0.2[A-B]	<0.1[<A]	<0.1[<A]
Acenaphthylene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	0.2[A-B]	<0.1[<A]	<0.1[<A]
Anthracene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	0.4[A-B]	<0.1[<A]	<0.1[<A]
Benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	1.0[B]	0.4[A-B]	0.2[A-B]
Benzo(a)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	0.9[A-B]	0.4[A-B]	0.2[A-B]
Benzo(e)pyrene	mg/kg					0.1	0.1	<0.1	0.6	0.2	0.1
Benzo(b+j+k) fluoranthene	mg/kg	0.1	1	10	136	0.1	<0.1[<A]	<0.1[<A]	1.5[B-C]	0.6[A-B]	0.3[A-B]
Benzo(c)phenanthrene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	0.2[A-B]	<0.1[<A]	<0.1[<A]
Benzo(g,h,i)perylene	mg/kg	0.1	1	10	18	0.1	<0.1[<A]	<0.1[<A]	0.5[A-B]	0.2[A-B]	0.1[A]
Chrysene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	1.0[B]	0.4[A-B]	0.2[A-B]
Dibenzo(a,h)anthracene	mg/kg	0.1	1	10	82	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	0.1[A]	<0.1[<A]	<0.1[<A]
Dimethyl-7,12 benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Fluoranthene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	2.1[A-B]	0.7[A-B]	0.4[A-B]
Fluorene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	0.2[A-B]	<0.1[<A]	<0.1[<A]
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	0.6[A-B]	0.2[A-B]	0.1[A]
Methyl-3 cholanthrene	mg/kg	0.1	1	10	150	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Naphthalene	mg/kg	0.1	5	50	56	0.1	<0.1[<A]	<0.1[<A]	0.2[A-B]	<0.1[<A]	<0.1[<A]
Phenanthrene	mg/kg	0.1	5	50	56	0.1	<0.1[<A]	<0.1[<A]	1.7[A-B]	0.4[A-B]	0.3[A-B]
Pyrene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	1.9[A-B]	0.7[A-B]	0.4[A-B]
Methyl-1 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Methyl-2 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-1,3 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Trimethyl-2,3,5 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]

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AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13Q791963

PROJECT: 2499-01

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:W.C.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire de Qc

PAHs (Soil)								
DATE RECEIVED: 2013-12-09				DATE REPORTED: 2014-02-17				
		SAMPLE DESCRIPTION:			PE18 1VR	PE19 2VR	PE19 3VR	PE20 2VR
		SAMPLE TYPE:			Soil	Soil	Soil	Soil
		DATE SAMPLED:			2013-12-04	2013-12-04	2013-12-04	2013-12-05
					5038655	5038660	5038661	5038663
Surrogate	Unit	Acceptable Limits			5038655	5038660	5038661	5038663
Acenaphthene-d10	%	40-140			95	89	105	92
Benzo(a)anthracene-d12	%	40-140			97	95	103	90
Pyrene-d10	%	40-140			96	100	104	92

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AGAT CERTIFICATE OF ANALYSIS

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Certificate of Analysis

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SAMPLED BY: W.C.

ATTENTION TO: Frederic Lortie

SAMPLING SITE: Manège militaire de Qc

PAHs (Soil)											
DATE RECEIVED: 2013-12-09							DATE REPORTED: 2014-02-17				
Parameter	Unit	SAMPLE DESCRIPTION:					PE22 4VR	PE23 2VR	PE23 4VR	PE24 2VR	PE24 2VR DUP
		SAMPLE TYPE:					Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:					2013-12-05	2013-12-04	2013-12-04	2013-12-05	2013-12-05
		G / S: A	G / S: B	G / S: C	G / S: D	RDL	5038667	5038668	5038670	5038672	5038673
Acenaphtene	mg/kg	0.1	10	100	100	0.1	0.2[A-B]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Acenaphthylene	mg/kg	0.1	10	100	100	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Anthracene	mg/kg	0.1	10	100	100	0.1	0.4[A-B]	<0.1[<A]	<0.1[<A]	0.1[A]	0.1[A]
Benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	1.0[B]	<0.1[<A]	0.2[A-B]	0.5[A-B]	0.4[A-B]
Benzo(a)pyrene	mg/kg	0.1	1	10	34	0.1	0.9[A-B]	<0.1[<A]	0.1[A]	0.5[A-B]	0.4[A-B]
Benzo(e)pyrene	mg/kg					0.1	0.5	<0.1	<0.1	0.3	0.2
Benzo (b+j+k) fluoranthene	mg/kg	0.1	1	10	136	0.1	1.3[B-C]	<0.1[<A]	0.2[A-B]	0.7[A-B]	0.6[A-B]
Benzo(c)phenanthrene	mg/kg	0.1	1	10	56	0.1	0.1[A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Benzo(g,h,i)perylene	mg/kg	0.1	1	10	18	0.1	0.4[A-B]	<0.1[<A]	<0.1[<A]	0.2[A-B]	0.2[A-B]
Chrysene	mg/kg	0.1	1	10	34	0.1	0.9[A-B]	<0.1[<A]	0.2[A-B]	0.5[A-B]	0.4[A-B]
Dibenzo(a,h)anthracene	mg/kg	0.1	1	10	82	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-7,12 benzo(a)anthracene	mg/kg	0.1	1	10	34	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Fluoranthene	mg/kg	0.1	10	100	100	0.1	2.1[A-B]	<0.1[<A]	0.3[A-B]	0.9[A-B]	0.7[A-B]
Fluorene	mg/kg	0.1	10	100	100	0.1	0.2[A-B]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	34	0.1	0.5[A-B]	<0.1[<A]	<0.1[<A]	0.3[A-B]	0.2[A-B]
Methyl-3 cholanthrene	mg/kg	0.1	1	10	150	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Naphthalene	mg/kg	0.1	5	50	56	0.1	0.2[A-B]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Phenanthrene	mg/kg	0.1	5	50	56	0.1	1.6[A-B]	<0.1[<A]	0.2[A-B]	0.5[A-B]	0.3[A-B]
Pyrene	mg/kg	0.1	10	100	100	0.1	1.8[A-B]	<0.1[<A]	0.3[A-B]	0.8[A-B]	0.6[A-B]
Methyl-1 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Methyl-2 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Dimethyl-1,3 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]
Trimethyl-2,3,5 naphthalene	mg/kg	0.1	1	10	56	0.1	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]	<0.1[<A]

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Certificate of Analysis

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:W.C.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire de Qc

PAHs (Soil)								
DATE RECEIVED: 2013-12-09				DATE REPORTED: 2014-02-17				
			SAMPLE DESCRIPTION:	PE22 4VR	PE23 2VR	PE23 4VR	PE24 2VR	PE24 2VR DUP
			SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
			DATE SAMPLED:	2013-12-05	2013-12-04	2013-12-04	2013-12-05	2013-12-05
				5038667	5038668	5038670	5038672	5038673
Surrogate	Unit	Acceptable Limits						
Acenaphtene-d10	%	40-140		88	81	87	86	89
Benzo(a)anthracene-d12	%	40-140		87	81	86	86	88
Pyrene-d10	%	40-140		89	83	88	88	91

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

Certified By:




AGAT Laboratories' procedure for signatures and signatories adheres strictly to the requirements of accreditation ISO 17025:2005 as required by CALA, SCC and MDDEP where applicable. All electronic signatures on AGAT certificates are password protected and all signatories meet their regional and scope of accreditation requirements and are approved by CALA, SCC and MDDEP.



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13Q791963

PROJECT: 2499-01

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CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

SAMPLED BY:W.C.

ATTENTION TO: Frederic Lortie

SAMPLING SITE:Manège militaire de Qc

Petroleum Hydrocarbons C10-C50 (Soil)

DATE RECEIVED: 2013-12-09

DATE REPORTED: 2014-02-17

					SAMPLE DESCRIPTION:	PE19 3VR	PE21 1VR	PE22 3VR	PE24 2VR	
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	
					DATE SAMPLED:	2013-12-04	2013-12-04	2013-12-05	2013-12-05	
Parameter	Unit	G / S: A	G / S: B	G / S: C	G / S: D	RDL	5038661	5038664	5038666	5038672
Petroleum Hydrocarbons C10-C50	mg/kg	300	700	3500	10000	100	<100[<A]	102[<A]	<100[<A]	114[<A]
Surrogate	Unit	Acceptable Limits								
Nonane	%			40-140			93	105	108	108

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to QC PTC (Criteria A), B Refers to QC PTC (Criteria B), C Refers to QC PTC (Criteria C), D Refers to QC RESC (Annex 1)

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Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

PROJECT: 2499-01

SAMPLED BY: W.C.

AGAT WORK ORDER: 13Q791963

ATTENTION TO: Frédéric Lortie

SAMPLING SITE: Manège militaire de Qc

Soil Analysis															
RPT Date: 2014-02-17			DUPLICATE			REFERENCE MATERIAL			METHOD BLANK			MATRIX SPIKE			
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Metals + Hg (Soil)															
Arsenic	5038660	5038660	< 5	< 5	0.0%	< 5	NA	80%	120%	94%	80%	120%	94%	70%	130%
Cadmium	5038660	5038660	< 0.9	< 0.9	0.0%	< 0.9	NA	80%	120%	94%	80%	120%	92%	70%	130%
Chromium	5038660	5038660	<45	<45	0.0%	< 45	NA	80%	120%	101%	80%	120%	98%	70%	130%
Copper	5038660	5038660	<40	<40	0.0%	< 40	NA	80%	120%	100%	80%	120%	104%	70%	130%
Tin	5038660	5038660	< 5	< 5	0.0%	< 5	NA	80%	120%	95%	80%	120%	92%	70%	130%
Mercury	5038660	5038660	< 0.2	< 0.2	0.0%	< 0.2	NA	80%	120%	116%	80%	120%	110%	70%	130%
Nickel	5038660	5038660	<30	<30	0.0%	< 30	NA	80%	120%	101%	80%	120%	98%	70%	130%
Lead	5038660	5038660	<30	<30	0.0%	< 30	NA	80%	120%	97%	80%	120%	97%	70%	130%
Zinc	5038660	5038660	<100	<100	0.0%	< 100	NA	80%	120%	103%	80%	120%	98%	70%	130%
Metals (soil)															
Silver	5038660	5038660	< 0.5	< 0.5	0.0%	< 0.5	NA	80%	120%	97%	80%	120%	92%	70%	130%
Barium	1	NA	NA	NA	0.0%	< 20	NA	80%	120%	98%	80%	120%	NA	70%	130%
Cobalt	1	NA	NA	NA	0.0%	< 15	NA	80%	120%	100%	80%	120%	NA	70%	130%
Manganese	1	NA	NA	NA	0.0%	< 10	NA	80%	120%	100%	80%	120%	NA	70%	130%
Molybdenum	1	NA	NA	NA	0.0%	< 2	NA	80%	120%	106%	80%	120%	NA	70%	130%
Selenium	5038660	5038660	< 1.0	< 1.0	0.0%	< 1.0	NA	80%	120%	97%	80%	120%	97%	70%	130%

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Quality Assurance

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

PROJECT: 2499-01

SAMPLED BY: W.C.

AGAT WORK ORDER: 13Q791963

ATTENTION TO: Frederic Lortie

SAMPLING SITE: Manège militaire de Qc

Trace Organics Analysis

RPT Date: 2014-02-17			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measure d Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
PAHs (Soil)															
Acenaphtene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	96%	70%	130%	NA	100%	100%	93%	60%	140%
Acenaphtylene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	95%	70%	130%	NA	100%	100%	93%	60%	140%
Anthracene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	92%	70%	130%	NA	100%	100%	91%	60%	140%
Benzo(a)anthracene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	99%	70%	130%	NA	100%	100%	90%	60%	140%
Benzo(a)pyrene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	91%	70%	130%	NA	100%	100%	92%	60%	140%
Benzo(e)pyrene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	94%	60%	140%
Benzo (b+j+k) fluoranthene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	95%	70%	130%	NA	100%	100%	98%	60%	140%
Benzo(c)phenanthrene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	98%	70%	130%	NA	100%	100%	89%	60%	140%
Benzo(g,h,i)perylene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	88%	70%	130%	NA	100%	100%	102%	60%	140%
Chrysene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	93%	70%	130%	NA	100%	100%	94%	60%	140%
Dibenzo(a,h)anthracene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	92%	60%	140%
Dibenzo(a,i)pyrene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	75%	70%	130%	NA	100%	100%	84%	60%	140%
Dibenzo(a,h)pyrene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	84%	70%	130%	NA	100%	100%	102%	60%	140%
Dibenzo(a,l)pyrene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	97%	70%	130%	NA	100%	100%	106%	60%	140%
Dimethyl-7,12 benzo(a)anthracene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	120%	70%	130%	NA	100%	100%	119%	60%	140%
Fluoranthene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	88%	60%	140%
Fluorene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	95%	70%	130%	NA	100%	100%	93%	60%	140%
Indeno(1,2,3-cd)pyrene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	80%	70%	130%	NA	100%	100%	80%	60%	140%
Methyl-3 cholanthrene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	94%	70%	130%	NA	100%	100%	87%	60%	140%
Naphthalene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	93%	70%	130%	NA	100%	100%	82%	60%	140%
Phenanthrene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	93%	70%	130%	NA	100%	100%	93%	60%	140%
Pyrene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	99%	70%	130%	NA	100%	100%	93%	60%	140%
Methyl-1 naphthalene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	89%	70%	130%	NA	100%	100%	88%	60%	140%
Methyl-2 naphthalene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	96%	70%	130%	NA	100%	100%	95%	60%	140%
Dimethyl-1,3 naphthalene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	89%	70%	130%	NA	100%	100%	86%	60%	140%
Trimethyl-2,3,5 naphthalene	1	5038660	< 0.1	< 0.1	0.0%	< 0.1	111%	70%	130%	NA	100%	100%	107%	60%	140%
Acenaphtene-d10	1	5038660	89	96	7.6%	86	90%	40%	140%	NA	100%	100%	94%	40%	140%
Benzo(a)anthracene-d12	1	5038660	95	98	3.1%	86	91%	40%	140%	NA	100%	100%	95%	40%	140%
Pyrene-d10	1	5038660	100	102	2.0%	86	91%	40%	140%	NA	100%	100%	89%	40%	140%
Petroleum Hydrocarbons C10-C50 (Soil)															
Petroleum Hydrocarbons C10-C50	1	5038666	< 100	< 100	0.0%	< 100	102%	70%	130%	NA	100%	100%	117%	60%	140%
Nonane	1	5038666	108	111	2.7%	111	114%	40%	140%	NA	100%	100%	97%	40%	140%

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Method Summary

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

PROJECT: 2499-01

SAMPLED BY: W.C.

AGAT WORK ORDER: 13Q791963

ATTENTION TO: Frederic Lortie

SAMPLING SITE: Manège militaire de Qc

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis					
Silver	2014-12-10	2014-12-11	MET-161-6106F, 6108F	MA. 200 - Mét 1.2R2	ICP/MS
Barium	2013-12-10	2013-12-10	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Cobalt	2013-12-10	2013-12-10	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Manganese	2013-12-10	2013-12-10	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Molybdenum	2013-12-10	2013-12-10	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Selenium	2014-12-10	2014-12-11	MET-161-6106F	EPA 3050, EPA 6020	ICP-MS
Arsenic	2013-12-10	2013-12-11	MET-161-6107F	EPA 3050, EPA 6020	ICP-MS
Cadmium	2013-12-10	2013-12-11	MET-161-6106F, 6108F	MA. 200 - Mét 1.2R2	ICP/MS
Chromium	2013-12-10	2013-12-10	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Copper	2013-12-10	2013-12-10	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Tin	2013-12-10	2013-12-11	MET-161-6106F, 6108F	MA. 200 - Mét 1.2R2	ICP/MS
Mercury	2013-12-10	2013-12-10	MET-161-6107F	EPA 245.5	FIMS
Nickel	2013-12-10	2013-12-10	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Lead	2013-12-10	2013-12-10	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Zinc	2013-12-10	2013-12-10	MET-161-6102F	MA. 200 - Mét 1.1 ; MA. 203 - Mét 3.1	ICP/OES
Sulphur	2013-12-12	2013-12-12	E-A-EN-EN-FL-PC-MD007	E-A-EN-EN-FL-PC-MD007	IC/EC

Method Summary

CLIENT NAME: LABORATOIRE D'EXPERTISE DE QUEBEC

PROJECT: 2499-01

SAMPLED BY: W.C.

AGAT WORK ORDER: 13Q791963

ATTENTION TO: Frederic Lortie

SAMPLING SITE: Manège militaire de Qc

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis					
Acenaphtene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphthylene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Anthracene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)pyrene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(e)pyrene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo (b+j+k) fluoranthene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(c)phenanthrene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(g,h,i)perylene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Chrysene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)anthracene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,i)pyrene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,h)pyrene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dibenzo(a,l)pyrene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-7,12 benzo(a)anthracene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluoranthene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Fluorene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Indeno(1,2,3-cd)pyrene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-3 cholanthrene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Naphthalene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Phenanthrene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-1 naphthalene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Methyl-2 naphthalene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Dimethyl-1,3 naphthalene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Trimethyl-2,3,5 naphthalene	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Acenaphtene-d10	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Benzo(a)anthracene-d12	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Pyrene-d10	2013-12-12	2013-12-12	ORG-160-5102F	MA. 400 - HAP 1.1	GC/MS
Petroleum Hydrocarbons C10-C50	2013-12-12	2013-12-12	ORG-160-5100F	MEF 410 - HYD. 1.0	GC/FID
Nonane	2013-12-12	2013-12-12	PA-S-HCP	MA. 400 - HYD 1.0	GC/FID

APPENDIX “E”

Grille de gestion des sols contaminés excavés intérimaire
(Interim Contaminated Excavated Soil Management Schedule)

GRILLE DE GESTION DES SOLS CONTAMINÉS EXCAVÉS INTÉRIMAIRE

Tirée de la « Politique de protection des sols et de réhabilitation des terrains contaminés » (1999)
du ministère du Développement durable, de l'Environnement, de la Faune et des Parcs du Québec.

NIVEAU DE CONTAMINATION	OPTIONS DE GESTION
<A	1. Utilisation sans restriction.
Plage A-B	1. Utilisation comme matériaux de remblayage sur les terrains contaminés à vocation résidentielle en voie de réhabilitation* ou sur tout terrain à vocation commerciale ou industrielle, à la condition que leur utilisation n'ait pas pour effet d'augmenter la contamination** du terrain récepteur et, de plus, pour un terrain à vocation résidentielle que les sols n'émettent pas d'odeurs d'hydrocarbures perceptibles. 2. Utilisation comme matériaux de recouvrement journalier dans un lieu d'enfouissement sanitaire (LES). 3. Utilisation comme matériaux de recouvrement final dans un LES à la condition qu'ils soient recouverts de 15 centimètres de sol propre.
Plage B-C	1. Décontamination de façon optimale*** dans un lieu de traitement autorisé et gestion selon le résultat obtenu. 2. Utilisation comme matériaux de remblayage sur le terrain d'origine à la condition que leur utilisation n'ait pas pour effet d'augmenter la contamination** du terrain et que l'usage du terrain soit à vocation commerciale ou industrielle. 3. Utilisation comme matériaux de recouvrement journalier dans un LES.
>C	1. Décontamination de façon optimale*** dans un lieu de traitement autorisé et gestion selon le résultat obtenu. 2. Si l'option précédente est impraticable, dépôt définitif dans un lieu d'enfouissement sécuritaire autorisé pour recevoir des sols.

* Les terrains à vocation résidentielle en voie de réhabilitation sont ceux voués à un usage résidentiel dont une caractérisation a démontré une contamination supérieure au critère B et où l'apport de sols en provenance de l'extérieur sera requis lors des travaux de restauration.

** La contamination réfère à la nature des contaminants et leur concentration.

*** Le traitement optimal est défini pour l'ensemble des contaminants par l'atteinte du critère B ou la réduction de 80% de la concentration initiale et pour les volatils par l'atteinte du critère B. À cet égard, les volatils sont définis comme étant les contaminants dont le point d'ébullition est <180°C ou dont la constante de la loi de Henry est supérieure à $6,58 \times 10^{-7}$ atm-m³/g incluant les contaminants identifiés dans la section III de la grille des critères de sols incluse à l'annexe 2 de la politique de protection des sols et de réhabilitation des terrains contaminés.