

**Gartner  
Lee  
Limited**

**Phase II Environmental Site Assessment  
7100 & 7300 Pullman Street  
Montreal, Quebec**

*Prepared For:*  
**Design & Construction Giffels Québec Inc.**

*Prepared By:*  
**Gartner Lee Limited**

*GLL 22-548*

*October 30th, 2002*

*Distribution*  
*3 Client*  
*1 File*

# Executive Summary

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At the request of Mr. Tony Aksich of Design & Construction Giffels Québec Inc., Gartner Lee Limited (GLL) conducted a Phase II Environmental Site Assessment (ESA) of the property located at 7100 Pullman Street and part of the property located at 7300 Pullman Street in Montreal, Quebec (hereafter referred to as the subject property). The properties, belonging to Canadian National (CN) are occupied by two-commercial buildings that are currently vacant but were previously used by CN as a cross-dock warehouse and for the maintenance of railcar wheels.

The objective of the Phase II ESA was to identify the current soil quality on the subject properties and compare the study results to the guidelines provided in the Quebec Policy for the Protection of Soils and the Clean-up of Contaminated Sites as part of an environmental due diligence program being undertaken by Giffels prior to the purchase of the properties.

As a result of a review of the Phase II intrusive investigation and field observations, the following conclusions are presented:

- a) Twenty-five (25) test pits were initially excavated on the subject properties to a maximum depth of 3.0 meters;
- b) Selected soil samples were submitted for petroleum hydrocarbons  $C_{10} - C_{50}$ , metals (Cd, Cr, Cu, Ni, Pb and Zn) and polycyclic aromatic hydrocarbons (PAH) analyses;
- c) All petroleum hydrocarbons  $C_{10} - C_{50}$  and PAH concentrations in samples collected from the first 25 test pits were below the commercial/industrial land use guidelines;
- d) Samples collected from 2.0 to 3.0 meters from TP2 and TP10 indicated copper concentration exceeding the commercial/industrial land use guideline;
- e) A complimentary soil characterisation was undertaken to confirm the volume of soils having copper concentrations exceeding the commercial/industrial land use guideline;
- f) Eighteen (18) additional test pits were excavated on the subject properties to a maximum depth of 4.0 meters;
- g) Selected soil samples were submitted for petroleum hydrocarbons  $C_{10} - C_{50}$ , metals and PAH analyses;
- h) All petroleum hydrocarbons  $C_{10} - C_{50}$  concentrations were below the commercial/industrial land use guidelines;
- i) Samples collected from 2.0 to 3.0 meters from TP29, TP30, TP31 TP32 and TP40 and the sample collected from 3.0 to 4.0 metres from TP32 had copper and/or zinc concentration exceeding the commercial/industrial land use guidelines. Construction debris such as slag and refractory bricks was observed in those test pits, which may explain these high concentrations.
- j) PAH concentrations were also found to exceed the commercial/industrial generic guidelines in the sample collected from 1.0 to 2.0 metres in TP28. No visual sign of contamination was observed in this test pit. The high PAH concentrations could

originate from the leaching of the known bunker contamination reported by DDH for this area of the properties.

- k) Based on the analytical results of the soil characterisation conducted by GLL, and on the previous characterisation conducted by DDH, the estimated volume of soil showing copper concentration exceeding the commercial/industrial guideline is 1,100 m<sup>3</sup> in the area of TP2 (TP29 to TP32) and 400 m<sup>3</sup> in the area of TP10 (TP40).

This report was prepared for the sole use of Design & Construction Giffels Québec Inc.

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## 1. Introduction

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At the request of Mr. Tony Aksich of Design & Construction Giffels Québec Inc. (Giffels), Gartner Lee Limited (GLL) conducted a Phase II Environmental Site Assessment (ESA) of the property located at 7100 Pullman Street and part of the property located at 7300 Pullman Street in Montreal, Quebec (hereafter referred to as the subject properties). The properties, belonging to Canadian National (CN) are occupied by two-commercial buildings that are currently vacant but were previously used by CN as a cross-dock warehouse and for the maintenance of railcar wheels. The properties are legally described as Lots 144P22, 144P21, 142-P1500, P4688 and 4689-3, in the borough of South-West in the City of Montreal, Quebec and is located to the north-east of Highways 20 and 15. The properties are located approximately 5 km north of the St-Lawrence River.

The objective of the ESA was to identify the current soil quality on the subject properties and compare the study results to the guidelines provided in the Quebec Policy for the Protection of Soils and the Clean-up of Contaminated Sites prior to the purchase of the properties by Giffels. As input to the Phase II ESA, GLL reviewed reports for previous environmental investigations, as well as other relevant drawings and documentation. The Phase II ESA focussed on evaluating potential environmental concerns, mainly related to the backfill material on the subject properties.

This Phase II site assessment included the collection and analysis of soil samples from the CN properties. The location of the CN properties is shown on Figure 1, and a 1980 air photo of the properties and surrounding area is provided on Figure 2. Details of the properties are shown on Figures 3 and 4. Figures and Tables are provided following the end of the text.

GLL's project manager for this Phase II investigation was Marie Allard, Certified Environmental Manager (CEM) from our Montreal office. The field work was co-ordinated and documented by Christina Turcotte, also from our Montreal office. The field activities for the project were completed in October 2002.

### 1.1 Background and Purpose

This Phase II ESA was conducted as part of an environmental due diligence program being undertaken by Giffels to document environmental conditions and identify potential environmental liabilities at the CN properties. The ESA included:

- a) Identify areas of environmental concern, based on a review of the available background information;
- b) Investigate the areas of environmental concern, to characterize the environmental quality of the soil within the properties limits;

- c) Delineate the vertical and horizontal extent of contamination identified, where applicable and include volume estimates;
- d) Provide a factual report;
- e) Provide recommendations and rationale for defining or addressing issues identified; and
- f) Provide comments on a management action strategy.

## 1.2 Scope of Work

The scope of work for the Phase II ESA included the following activities:

- a) Review by GLL of the Phase II ESA conducted by D'Aragon, Desbiens Halde Associated Ltd. (DDH) and other documents provided by Giffels;
- b) A preliminary site visit and development of the Phase II work plan;
- c) Identifying proposed sampling locations and obtaining utility locates from the local utility companies;
- d) Excavating 43 test pits on-site;
- e) Collection and analysis of soil samples on-site from the test pits;
- f) Data interpretation and preparation of this report.

The Phase II ESA was conducted by Gartner Lee Limited.

## 1.3 Description of the Study Area

The subject properties are roughly rectangular in shape and encompasses approximately 27 000 m<sup>2</sup>. The properties are provided with municipal water supply and also with municipal storm and sanitary sewers. The subject properties are located within a commercial/industrial area to the north-east of Highway 20 and 15 in the borough of South-West in Montreal. The ground surface around the buildings is relatively flat and consists of a compacted gravel surface. There is a slight slope along the majority of the southern part of the properties and a steeper slope boundary along the CN railway.

## 1.4 Previous Investigation

Previous environmental work performed on the properties included:

- A Phase II Environmental Site Assessment (ESA) conducted by DDH;

The previous investigation identified metal (Copper), Petroleum Hydrocarbons C<sub>10</sub> – C<sub>50</sub> and Polycyclic Aromatic Hydrocarbons concentrations exceeding the Quebec Ministry of the Environment (MENV) industrial/commercial land use guidelines on the subject properties.

## 1.5 Report Format

This report is presented in six sections:

- a) Sections 1 and 2 present the general information about the project and describe the scope of work and methodology used;
- b) Section 3 presents the results of the subsurface investigation;
- c) Section 4 provides conclusions, recommendations and the assessment of remedial options if required;
- d) Sections 5 and 6 detail the limitations of the assessment and its findings and the qualification of the investigators.

## 2. Subsurface Investigation Methodology

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### 2.1.1 Health and Safety

A health and safety plan (HASP) was prepared for field activities at the subject properties to help protect personnel, the environment, the public and the equipment used on the subject properties. The HASP addressed the requirements of the Occupational Health and Safety Act as well as the OHSC Work Protection Code (OHSC 1999). The field protocols used in the environmental investigation on the subject properties are in general, in compliance with those present in the Quebec Ministry of Environment (MENV) Policy for the Protection of Soils and the Clean up of Contaminated Sites, 1998.

General GLL health and safety protocols were reviewed and modified to site-specific conditions. A site specific health and safety plan was developed for the site and included all of the following:

- a) Locates performed for any underground services by Info-Excavation;
- b) The use of personal protection equipment including latex gloves, visible vests, hard hats, safety glasses, hearing protection and safety boots;
- c) Delineating work areas and limiting public access;
- d) Directions and phone numbers of the nearest emergency services;
- e) CPR and First Aid trained personnel; and
- f) The use of cellular phones.

### 2.1.2 Location of Services

Prior to commencement of field activities at the CN properties, the locations of natural gas, water, sewer, telephone, electric and cable TV services were determined. Local utility companies including AT & T Canada, Montreal Electrical Commission Services, Gaz Metropolitain, Hydro-Quebec, 360 Networks and Videotron provided the utility locates prior to commencement of intrusive works. In cases where no services were present, utility companies provided notification of 'all clear' prior to that time. The utility clearance forms are retained in GLL's project technical file.

### 2.1.3 Soil Sampling

Twenty-five (25) test pits identified TP-1 to TP-25 were initially advanced on the subject properties (Figure 2) to a maximum depth of 3.0 metres or until native soils were attained. The test pits were advanced with the aid of a mechanical shovel owned and operated by Groupe C. Laganière of Montreal-East. Composite soil samples were collected from the sidewalls of each test pit at 1.0 m intervals. The sampling locations are shown on Figure 3.

The soil sampling was performed in accordance with the *Guide d'échantillonnage à des fins d'analyses environnementales - Cahier 5 - Échantillonnage des sols*, published by the direction des laboratoires of the MENV in 1995.

The bottled samples were stored on ice in a cooler and kept at a constant temperature of 4°C. They were submitted to the laboratory for analysis within the appropriate holding time.

Chain of Custody Reports were completed for the samples submitted for analysis to keep track of the samples collected and to ensure that the parties involved were properly informed as to the nature of the samples. These reports were made up prior to delivering the samples to the laboratory and normally include the following information: project number; sample numbers, type of analysis required, sampling date and time, sampler's name and who the laboratory results should be forwarded to. The QA/QC samples were placed in coolers with ice and submitted to the laboratory with Chain of Custody forms. Copies of the Chain of Custody forms are retained in GLL'S project files.



### **Decontamination of Sampling Equipment**

The sampling equipment was decontaminated between sample collection using multiple water and laboratory grade phosphate free detergent rinsing followed by a distilled water rinse followed by acetone, hexane and again thoroughly rinsed with distilled water. The sampling equipment was then allowed to air dry prior to reuse.

## **2.2 Soil Analysis**

The soil samples were sent to Bodycote Materials Testing laboratories located in Pointe-Claire, Quebec. Bodycote is certified and accredited by the Quebec Ministry of the Environment using ISO Guide 25 protocols.

During the Phase II field investigations described above, a total of 75 soil samples were collected from the 25 soil sampling locations. Based on the field screening procedures a total of 41 samples were submitted for analysis. The soil samples were submitted to Bodycote for analysis of the following parameters:

- a) Metals (Cd, Cr, Cu, Ni, Pb and Zn); and/or
- b) Petroleum Hydrocarbons C<sub>10</sub> – C<sub>50</sub>; and/or
- c) Polycyclic Aromatic Hydrocarbons (PAH);

Copies of the original laboratory reports are provided in Appendix A. A summary of the soil analyses and a comparison to the relevant MENV soil guidelines are provided in Table 1.

## **2.3 Quality Assurance and Quality Control (QA/QC)**

Quality control in this project consisted of strict adherence to industry-standard sample collection, handling and analysis methods. These include measures such as decontamination of sampling equipment between sample locations; adherence to sample holding times, and maintaining samples in a cool environment.

The laboratory used internal laboratory method blanks and duplicates to measure analytical method precision. A chain of custody report was completed for all samples submitted for analysis to keep track of the samples collected and to ensure that all parties involved were properly informed as to the nature of the samples. These reports are made up prior to delivering the samples to the laboratory and include the following information: project number; sample numbers, type of analysis required, sampling date and time, note on field filtration if any, preservatives if any, sampler's name and name of individual to receive analytical results.

## 3. Findings

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### 3.1 Applicable Analytical Criteria

The soil and groundwater quality was evaluated according to the generic criteria described in the Policy for the Protection of Soils and the Clean up of Contaminated Sites, issued by the MENV in 1998.

The generic guidelines are used to evaluate the extent of any potential contamination of a site. They are also used as a decontamination objective for a specific land use and as a tool for the management of excavated contaminated soils. They were established to protect the health of future users and for the protection of the environment.

The MENV has developed three (3) levels of generic guidelines for soil quality for many substances. Levels A, B, and C are summarised as:

- Level A: Background values for inorganic parameters and detection limit for organic parameters. The detection limit is defined as the minimum concentration that can be quantified using an analytical method with a defined reliability. Excavated soils may be used without restriction.
- Level B: Maximum acceptable limits for a residential, recreational and institutional land use. Commercial properties located within a residential area are also included. Excavated contaminated soils may be used as daily cover for a sanitary landfill site.
- Level C: Maximum acceptable limit for industrial and commercial land use not located in a residential area. Disposal of soils contaminated in excess of the C criteria are required to be disposed of either to an authorised treatment centre or disposal at an authorised secured landfill site.

Level «C» generic guidelines for soils describe the degree of contamination acceptable for the commercial/industrial land use of the subject properties.

## 3.2 Physical Conditions

The ground surface of the subject properties under investigation is covered with medium sized gravel. On the majority of the subject properties, it is followed by layers of coarse gravel, and reddish brown to greyish colored sand. The sand is underlain by compact grey silt or bluish clayey silt that gradually becomes loose in nature. A layer of olive-green to black sand was encountered below the silt and then coarse sand, sometimes with boulders was located below this layer. Petroleum hydrocarbon odours were detected in TP-8 (0-1 m), TP20 (between 1 and 3 meters in depth) and TP-24 (surface only). Solvent odours were detected in TP14-3. Significant quantities of debris such as red brick, refractory brick, slag, wood, stone slabs, concrete blocks and paper bags were observed in a large number of test pits including TP1, TP2, TP5, TP6, TP8, TP9, TP10, TP15, TP21 and TP24.

## 3.3 Laboratory Analysis Results

### 3.3.1 Quality Assurance and Quality Control (QA/QC)

Internal laboratory QA/QC is included in the laboratory analytical certificates (Appendix B) and includes analysis of soil and water laboratory surrogate standards, method blanks and spiked method blanks. Results were within the laboratory's acceptable limits. Soil and groundwater samples were both analysed within the recommended holding times and samples were received with the proper chain of custody.

### 3.3.2 Soil Quality

Analytical results from the soil samples are summarised in Table 1. All Petroleum Hydrocarbons C<sub>10</sub>–C<sub>50</sub> and PAH concentrations in samples collected from the first 25 test pits were below the commercial/industrial land use guidelines. However, samples collected from a depth of 2.0 to 3.0 meters from TP2 and TP10 had copper concentrations exceeding the commercial/industrial land use guideline. Field observations revealed construction debris such as refractory brick and burnt or rotting wood in those samples, which may explain these high concentrations. The highest copper concentration was found in TP2 which was excavated in the same area where DDH had found copper concentrations exceeding the commercial/industrial guideline.

## 3.4 Supplementary Soil Characterisation

In order to better delineate the soil volumes in the two areas that had copper concentrations exceeding the industrial/commercial land use guideline and to determine the soil quality on the southern portion of the properties, near the railway, eighteen (18) additional test pits identified TP-26 to TP-43 were advanced on the subject properties (Figure 4) to a maximum depth of 4.0 metres or until native soils were attained. The test pits were advanced with the aid of a mechanical shovel owned and operated by Groupe C.

Laganière of Montreal-East. Composite soil samples were collected from the sidewalls of each test pit at 1.0 m intervals. The sampling locations are shown on Figure 4.

Significant quantities of debris such as red brick, wood, slag and railway ties were again observed in all of the test pits except TP28 and TP39. A significant water infiltration was observed in TP28 that was excavated near a drainage ditch.

The soil samples were sent to Bodycote Materials Testing laboratories for metals; and/or Petroleum Hydrocarbons C<sub>10</sub> – C<sub>50</sub>; and/or PAH analysis.

Copies of the original laboratory reports are provided in Appendix A. A summary of the soil analyses and a comparison to the relevant MENV soil guidelines are provided in Table 2.

All Petroleum Hydrocarbons C<sub>10</sub> – C<sub>50</sub> concentrations were below the commercial/industrial land use guidelines. Samples collected from 2.0 to 3.0 meters from TP29, TP30, TP31, TP32 and TP40 as well as the sample collected from 3.0 to 4.0 metres from TP32 had copper and/or zinc concentrations exceeding the commercial/industrial land use guideline. Again, field observations revealed construction debris such as slag and refractory bricks in those samples, which may explain these high concentrations. PAH concentrations were also found to be exceeding the commercial/industrial generic guidelines in the sample collected from 1.0 to 2.0 metres in TP28. No visual sign of contamination was observed in this test pit. The high PAH concentrations could originate from the leaching of the known bunker contamination reported by DDH for this area of the properties.

Based on the analytical results of the soil characterisation conducted by GLL and by the previous characterisation conducted by DDH, the estimated volume of soil having copper concentrations exceeding the commercial/industrial guideline is 1,100 m<sup>3</sup> in the area of TP2 (TP29 to TP32) and 400 m<sup>3</sup> in the area of TP10 (TP40) (refer to Figure 5).

## 4. Conclusions and Recommendations

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As a result of the Phase II intrusive investigation and observations made in the field, the following conclusions are presented:

- a) Twenty-five (25) test pits were initially excavated on the subject properties to a maximum depth of 3.0 meters;
- b) Selected soil samples were submitted for petroleum hydrocarbons  $C_{10} - C_{50}$ , metals (Cd, Cr, Cu, Ni, Pb and Zn) and polycyclic aromatic hydrocarbons (PAH) analyses;
- c) All petroleum hydrocarbons  $C_{10} - C_{50}$  and PAH concentrations in samples collected from the first 25 test pits were below the commercial/industrial land use guidelines;
- d) Samples collected from 2.0 to 3.0 meters from TP2 and TP10 indicated copper concentration exceeding the commercial/industrial land use guideline;
- e) A complimentary soil characterisation was undertaken to confirm the volume of soils having copper concentrations exceeding the commercial/industrial land use guideline;
- f) Eighteen (18) additional test pits were excavated on the subject properties to a maximum depth of 4.0 meters;
- g) Selected soil samples were submitted for petroleum hydrocarbons  $C_{10} - C_{50}$ , metals and PAH analyses;
- h) All petroleum hydrocarbons  $C_{10} - C_{50}$  concentrations were below the commercial/industrial land use guidelines;
- i) Samples collected from 2.0 to 3.0 meters from TP29, TP30, TP31 TP32 and TP40 and the sample collected from 3.0 to 4.0 metres from TP32 had copper and/or zinc concentration exceeding the commercial/industrial land use guidelines. Construction debris such as slag and refractory bricks was observed in those test pits, which may explain these high concentrations.
- j) PAH concentrations were also found to exceed the commercial/industrial generic guidelines in the sample collected from 1.0 to 2.0 metres in TP28. No visual sign of contamination was observed in this test pit. The high PAH concentrations could originate from the leaching of the known bunker contamination reported by DDH for this area of the properties.
- k) Based on the analytical results of the soil characterisation conducted by GLL, and on the previous characterisation conducted by DDH, the estimated volume of soil showing copper concentration exceeding the commercial/industrial guideline is 1,100 m<sup>3</sup> in the area of TP2 (TP29 to TP32) and 400 m<sup>3</sup> in the area of TP10 (TP40).

## 5. Closure

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This report was prepared by Gartner Lee Limited and the information provided in this report is intended for the use of Design & Construction Giffels Québec Inc. Any use which a third party makes of this report, or any reliance on or decisions to be made based on this report are the responsibility of such third parties. Gartner Lee Limited accepts no responsibility for damages, if any are suffered by the third party, based on the information contained in this report. The scope of our investigation was limited to the drilling of boreholes, the advancing of test pits and the collection and chemical analysis of soil and groundwater samples. No sampling and analysis of air or wastes was conducted.

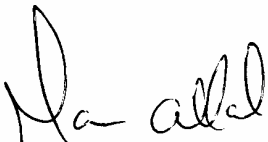
## 6. Qualifications of the Assessor

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Marie Allard received training in environmental technologies and has over twelve years experience providing expertise in environmental site assessment. Marie is a Project Manager with Gartner Lee Limited. She has completed numerous Phase II environmental soil characterisation studies and Phase III environmental site clean ups for various types of properties across Canada. Marie is a Certified Environmental Manager with the Environmental Assessment Association.

Menno R. Speyer is an Accredited Environmental Site Assessor with Gartner Lee Limited. Mr. Speyer is also on the board of director of the Canadian Environmental Auditing Association and is a Certified Environmental Practitioner with the Canadian Environmental Certification Approvals Board. Mr. Speyer has been responsible for numerous Phase I, II and III environmental site assessments for various types of properties across Canada. His education includes a Bachelor and Master's degree in Science.

### Report Prepared By:



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Project Manager



Menno R. Speyer, M.Sc., AESA, CEAS, CCEP  
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