# Phase II Environmental Site Assessment

195 Fort Street
Winnipeg, MB

Prepared for:

MMI Asset Management Ltd.
200-260 St. Mary Avenue
Winnipeg, MB R3C 0M6

Attn: Martin McGarry

January 22, 2016

Pinchin File: 110069.001



MEMBER OF
THE PINCHIN GROUP

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| **Issued To:** | **MMI Asset Management Ltd.** |
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## EXECUTIVE SUMMARY

Pinchin Ltd. (Pinchin) was retained through an Authorization to Proceed signed by Martin McGarry of MMI Asset Management Ltd. (Client) to conduct a Phase II Environmental Site Assessment (ESA) of the property located at 195 Fort Street in Winnipeg, Manitoba (hereafter referred to as the Site). The Site location is shown on Figure 1 (all Figures are provided in Appendix I).

The Site is developed with a three-storey commercial building (Site Building) occupied by Symcor and the Royal Bank of Canada.

The purpose of this Phase II ESA was to address potential issues of environmental concern identified during a Phase I ESA conducted by Pinchin in relation to the potential refinancing of the Site.

The results of the Phase I ESA completed by Pinchin identified the following potential issues of environmental concern:

- A residential dwelling formerly located near the south portion of the Site. Fill including demolition debris may have been used to infill the basement of the residential dwelling;
- Automotive servicing operations were located on the north and south portions of the Site from at least 1930 to 1970;
- A dry cleaning operation was located approximately 5 metres east of the Site in 1920 and a tailor (suspect dry cleaning operation) at this location from the early 1930s to the early 1950s, as identified in the reviewed city directories; and
- A fuel operation formerly located adjacent to the south portion of the Site, as identified in the 1930 and 1940 city directories.

Based on the findings noted above, Pinchin recommended completing a Phase II ESA at the Site.

The Phase II ESA was completed at the Site by Pinchin between November 28 and December 3, 2015, and consisted of the advancement of seven boreholes, all of which were completed as groundwater monitoring wells.

Select “worst case” soil samples collected during the borehole drilling program were submitted for a combination of laboratory analysis of benzene, toluene, ethylbenzene and xylenes (collectively BTEX), petroleum hydrocarbons (PHCs) in the F1 to F4 fraction range (F1-F4), volatile organic compounds (VOCs), polcyclic aromatic hydrocarbons (PAHs) and/or metals. Groundwater samples collected from the newly installed monitoring wells were submitted for a combination of laboratory analysis of BTEX, PHCs (F1-F4) and VOCs.

Based on Site-specific information, the soil quality was assessed based on the Canadian Council of Ministers of the Environment (CCME) "*Environmental Quality Guidelines*" accessed on the CCME web site in December, 2015, the CCME "*Canada-Wide Standards for Petroleum Hydrocarbons in Soil*", dated 2008 and the CCME "*Canadian Environmental Soil Quality Guidelines for the Protection of Environmental and Human Health - Polycyclic Aromatic Hydrocarbons*", dated 2010 (hereafter collectively referred to as the "CCME Soil Guidelines).

Manitoba Conservation and Water Stewardship has adopted the Ontario Ministry of the Environment and Climate Change (MOECC) "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*", dated April 15, 2011 (MOECC Table 3 Standards) to assess groundwater in non-potable groundwater conditions.

The reported concentrations of BTEX, PHCs (F1-F4), VOCs, PAHs and/or metals in the soil samples submitted for analysis met the CCME Soil Guidelines, with the following exceptions:

- Soil sample BH2-S2 collected at borehole BH2 (MW2), which had a concentration of PHCs (F2) that exceeded the CCME Soil Guideline; and
- Soil sample BH4-S2 collected at borehole BH4 (MW4), which had a concentrations of PHCs (F2) that exceeded the CCME Soil Guideline.

Reported concentrations in the groundwater samples submitted for analysis of BTEX, PHCs (F1-F4) and VOCs satisfied their respective MOECC Table 3 Standards, with the following exception:

- The groundwater sample collected at monitoring well BH2 (MW2) exceeded the MOECC Table 3 Standard for PHCs (F2).
- The groundwater sample collected at monitoring well BH3 (MW3) exceeded the MOECC Table 3 Standard for PHCs (F2).

Based on the findings of this Phase II ESA, Pinchin recommends that additional boreholes be completed at the Site to delineate the extent of soil and groundwater impacts at the Site.

As of April 1, 2014, new amendments to the Contaminated Sites Remediation Act (CSRA) and Contaminated Sites Remediation Regulation (CSRR) came into effect. Section 3.1 of the CSRA states that the owner or occupier of a site must notify Manitoba Conservation in writing when he or she becomes aware of information that indicates that the site has been contaminated at a level that exceeds a standard established or adopted by regulation (in this case the CSRR) and provide Manitoba Conservation and with all reports and any other documentation in his or her possession respecting the contamination at the Site.

*This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.*

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## 1.0 INTRODUCTION

Pinchin Ltd. (Pinchin) was retained through an Authorization to Proceed signed by Martin McGarry of MMI Asset Management Ltd. (Client) to conduct a Phase II Environmental Site Assessment (ESA) of the property located at 195 Fort Street in Winnipeg, Manitoba (hereafter referred to as the Site). The Site location is shown on Figure 1 (all Figures are provided in Appendix I).

The Site is developed with a three-storey commercial building (Site Building) occupied by Symcor and the Royal Bank of Canada.

The purpose of this Phase II ESA was to address potential issues of environmental concern identified during a Phase I ESA conducted by Pinchin in relation to the potential refinancing of the Site.

This Phase II ESA was completed in general accordance with the Canadian Standards Association document entitled "*Phase II Environmental Site Assessment, CSA Standard Z769-00 (R2013)*", dated 2000 and reaffirmed in 2013.

### 1.1 Background

Pinchin completed a Phase I ESA of the Site for the Client, the findings of which were provided in the report entitled *"Phase I Environmental Site Assessment 195 Fort Street, Winnipeg, Manitoba"*, dated December 7, 2015. Based on the results of the Phase I ESA completed by Pinchin, the following could result in potential subsurface impacts at the Site:

- A residential dwelling formerly located near the south portion of the Site. Fill including demolition debris may have been used to infill the basement of the residential dwelling;
- Automotive servicing operations were located on the north and south portions of the Site from at least 1930 to 1970;
- A dry cleaning operation was located approximately 5 metres east of the Site in 1920 and a tailor (suspect dry cleaning operation) at this location from the early 1930s to the early 1950s, as identified in the reviewed city directories; and
- A fuel operation formerly located adjacent to the south portion of the Site, as identified in the 1930 and 1940 city directories.

Based on the findings noted above, Pinchin recommended completing a Phase II ESA at the Site.

## 1.2 Scope of Work

The scope of work completed by Pinchin, as outlined in the Pinchin proposal entitled *"Proposal for Phase II Environmental Site Assessment 195 Fort Street, Winnipeg, Manitoba"* submitted to the Client on November 26, 2015, included the following:

- Retained the services of an independent contractor and public utility services to identify the locations of buried and overhead utility services prior to any drilling/excavation activities;
- Advancement of six boreholes on-Site and one borehole off-Site following the clearance of underground services, all of which were instrumented with a monitoring well;
- Submission of select "worst case" soil samples for a combination of laboratory analysis of benzene, toluene, ethylbenzene and xylenes (collectively BTEX), petroleum hydrocarbons (PHCs) in the F1 to F4 fraction ranges (F1-F4), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and/or metals;
- Collection of groundwater samples from each of the newly installed monitoring wells, following well development and purging, for a combination of laboratory analysis of BTEX, PHCs (F1-F4) and VOCs;
- Comparison of the soil and groundwater laboratory analytical results to the applicable regulatory criteria; and
- Preparation of a factual report detailing the findings of the Phase II ESA and recommendations.

The scope of work described in the Pinchin proposal included groundwater sampling at each of the newly installed monitoring wells. However, there was insufficient groundwater present in monitoring wells BH6 (MW6) and BH7 (MW7) at the time of the Phase II ESA to permit groundwater sampling.

## 2.0 METHODOLOGY

The investigation methodology was conducted in general accordance with the Manitoba Conservation and Water Stewardship (Manitoba Conservation) guidelines entitled "*Environmental Site Assessments in Manitoba*", dated October 2014 and "*Manitoba Criteria for BTEX in Investigation Results*", dated October 2014 (*Manitoba Conservation Guidelines*) and Pinchin's standard operating procedures (SOPs).

## 2.1 Borehole Investigation

Pinchin retained Maple Leaf Drilling Ltd. (Maple Leaf) to complete the borehole drilling program at the Site on November 28, 2015 following the clearance of underground services in the vicinity of the work area by public utility locators and a private utility locator retained by Pinchin.

The boreholes were advanced to a maximum depth of 4.6 metres below ground surface (mbgs) using a track mounted drill rig and portable electric drill rig both equipped with solid stem augers. Soil samples were collected at regular 0.75 metre (m) intervals from the auger flights. Discrete soil samples were collected from the auger flights and containerized in laboratory-supplied glass sampling jars.

Subsurface soil conditions were logged on-Site by Pinchin personnel at the time of drilling. Soil samples were examined for visual and olfactory evidence of impacts and a portion of each sample was analyzed in the field for solvent and petroleum-derived vapour concentrations in soil headspace using a photoionization detector (PID) and a hydrocarbon surveyor operated in methane elimination mode (RKI Eagle 2).

The approximate locations of the boreholes are shown on Figure 2 and a description of the subsurface stratigraphy encountered during the drilling program is documented in the borehole logs included in Appendix II.

## 2.2 Monitoring Well Installation

Groundwater monitoring wells were installed in boreholes BH1 (MW1), BH2 (MW2), BH3 (MW3), BH4 (MW4), BH5 (MW5), BH6 (MW6) and BH7 (MW7) to enable groundwater monitoring and sampling. The monitoring wells were constructed with 5.1 centimetre (cm) inner diameter (ID) flush-threaded Schedule 40 polyvinyl chloride (PVC) risers, followed by a length of 5.1 cm ID No. 10 slot PVC screen that intersected the water table.

Each well screen was sealed at the bottom using a threaded cap and each riser was sealed at the top with a lockable J-plug cap. Silica sand was placed around and above the screened interval to form a filter pack around the well screen. A layer of bentonite was placed above the silica sand and was extended to the ground surface. A protective flush-mount cover was installed at the ground surface over each riser pipe and cemented in place.

The approximate locations of the monitoring wells are shown on Figure 2. The monitoring well construction details are shown on the borehole logs included in Appendix II.

## 2.3 Groundwater Monitoring

The water levels within the monitoring wells were measured on December 1, December 3 and December 29, 2015 using an interface probe. The presence/absence of non-aqueous phase liquid (NAPL) was also assessed during groundwater monitoring using the interface probe.

## 2.4 Sampling and Laboratory Analysis

### *2.4.1 Soil*

Up to two most apparent “worst case” soil samples, based on vapour concentrations as well as visual and/or olfactory considerations, recovered from each borehole were submitted for a combination of laboratory analysis of BTEX, PHCs (F1-F4), VOCs, PAHs and/or metals.

The approximate borehole locations are shown on Figure 2. Table 1 provides a summary of the soil samples submitted for laboratory analysis (all Tables are provided within Appendix III).

### *2.4.2 Groundwater*

On December 1, 2015, newly installed groundwater monitoring wells BH1 (MW1), BH2 (MW2) and BH5 (MW5) were developed by being purged until dry, in accordance with Pinchin’s SOPs.

On December 3, 2015, newly installed groundwater monitoring wells BH1 (MW1), BH2 (MW2) and BH5 (MW5) were purged and sampled using Pinchin’s SOPs. The groundwater samples collected from these monitoring wells were submitted for laboratory analysis of BTEX, PHCs (F1-F4) and VOCs.

On December 29, 2015 newly installed groundwater monitoring wells BH3 (MW3) and BH4 (MW4) were purged and sampled using Pinchin’s SOPs. The groundwater samples collected from these monitoring wells were submitted for laboratory analysis of BTEX and PHCs (F1-F4).

All monitoring well development activities were conducted using dedicated inertial pumps comprised of Waterra polyethylene tubing and foot valves. Following pre-sampling purging with dedicated inertial pumps, sampling for PHCs (F2-F4) was conducted using a peristaltic pump and dedicated polyethylene tubing. Sampling for VOCs, PHCs (F1) and BTEX was then conducted using dedicated inertial pumps.

Pinchin notes that the groundwater recovery at monitoring wells BH6 (MW6) and BH7 (MW7) was poor at the time of the Phase II ESA therefore no groundwater samples were collected from these groundwater monitoring wells.

The approximate monitoring well locations are shown on Figure 2. Table 1 provides a summary of the groundwater samples submitted for laboratory analysis.

### *2.4.3 Analytical Laboratory*

Selected soil and groundwater samples were delivered to Maxxam Analytics Inc. (Maxxam) in Winnipeg, Manitoba for analysis. Maxxam is an independent laboratory accredited by the Standards Council of Canada and the Canadian Association for Laboratory Accreditation. Formal chain of custody records of the sample submissions were maintained between Pinchin and the staff at Maxxam.

## 2.5 QA/QC Protocols

Various quality assurance/quality control (QA/QC) protocols were followed during the Phase II ESA to ensure that representative samples were obtained and that representative analytical data were reported by the laboratory.

Field QA/QC protocols that were employed by Pinchin included the following:

- Care was exercised not to obtain soil samples that were in direct contact with the drilling equipment or that had been smeared along the edge of the borehole;
- Soil and groundwater samples were placed in laboratory-supplied glass sample jars;
- The monitoring wells were developed following installation and were purged to remove stagnant water prior to sample collection so that representative groundwater samples could be obtained. Dedicated purging and sampling equipment was used for monitoring well development, purging and sampling to minimize the potential for cross-contamination;
- Soil and groundwater samples were placed in coolers on ice immediately upon collection, with appropriate sample temperatures maintained prior to submission to the laboratory;
- Dedicated and disposable nitrile gloves were used for sample handling;
- Non-dedicated monitoring and sampling equipment (e.g., interface probe, soil sampling knife) was cleaned before initial use and between uses to minimize the potential for cross-contamination by washing with an Alconox™/potable water mixture followed by a deionized water rinse; and
- Sample collection and handling procedures were performed in general accordance with the *Manitoba Conservation Guidelines* and Pinchin's SOPs for Phase II ESAs.

Maxxam's internal laboratory QA/QC consisted of the analysis of laboratory duplicate, method blank, matrix spike and spiked blank samples and an evaluation of surrogate recoveries.

## 2.6 Regulatory Criteria

Manitoba Conservation has adopted Canadian Council of Ministers of the Environment (CCME) guidelines as the regulatory criteria applicable to soil conditions in Manitoba. Analytical results of soil samples are compared to criteria set forth in the CCME "*Environmental Quality Guidelines"* that are accessed at the CCME web site, the CCME *"Canada-Wide Standards for Petroleum Hydrocarbons in Soil",* dated 2008, and the CCME "*Canadian Environmental Soil Quality Guidelines for the Protection of Environmental and Human Health - Polycyclic Aromatic Hydrocarbons*", dated 2010. These guidelines are collectively referred to as the "CCME Soil Guidelines".

For assessing groundwater quality, Manitoba Conservation has adopted the following guidelines depending on groundwater conditions and/or receptor pathways:

- Ontario Ministry of the Environment and Climate Change (MOECC) "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*", dated April 15, 2011 (MOECC Table 3 Standards) for non-potable groundwater conditions;
- Health Canada *"Guidelines for Canadian Drinking Water Quality"*, dated August 2012 for potable groundwater conditions;
- CCME *"Canadian Water Quality Guidelines for the Protection of Aquatic Life"*, dated 1999 for protection of freshwater aquatic life; and
- CCME *"Canadian Water Quality Guidelines for the Protection of Agricultural Water Uses"*, dated 1999 for protection of livestock watering.

The above guidelines have been developed using a risk-based approach. The application of the appropriate criteria is dependent upon several site-specific conditions including:

- The existing/proposed land use;
- The existing/potential groundwater use;
- Soil depth; and
- Soil texture.

Guidelines are further subdivided into the following types of protection:

- Human health guidelines; and
- Environmental health guidelines.

Within each of these categories, several pathways are listed that describe how the chemical or compound in question would come in contact with the receptor. If a pathway is not applicable to a site, or a specific area of a site, then the corresponding guideline value is not applicable. If future use of a site is modified, pathways that were not applicable can become applicable and need to be reassessed.

Site-specific details for the evaluation of applicable pathways are as noted below:

- The Site is a commercial property and commercial land use guidelines are applicable to the Site.
- Potable water for the Site and surrounding area is supplied by the City of Winnipeg, with Shoal Lake serving as the water source. As such, groundwater is not a potable source on-Site or in the vicinity of the Site.
- Groundwater is not used for livestock watering at the Site and the Site is located more than 30 metres from the nearest water body. Therefore, the livestock watering and fresh water aquatic life pathways are not applicable to the Site.
- Native soils at the Site are prominently comprised of fine-grained soils (clay and silt) and fine-grained guidelines are applicable to the Site.
- The human health vapour inhalation pathway is applicable within 30 centimetres of a building foundation (or proposed building foundation). For the purpose of this Phase II ESA, the human health vapour inhalation pathway has been considered applicable to the Site.
- The environmental health soil contact, human health ingestion, and human health dermal contact pathways are applicable in areas where access to the soil is possible (i.e., not under asphalt, concrete or a building foundation). The areas of the Site included in this Phase II ESA were covered by asphalt, concrete and building foundation, therefore, the environmental health soil contact, human health ingestion and human health dermal contact pathways are considered to be not applicable to the Site.
- The off-Site migration check, management limit, and nutrient and energy cycling checks are applicable to all areas of the Site.

Based on the above evaluation, all soil analytical results have been compared to the CCME Soil Guidelines for commercial land use and fine-grained soils excluding the protection of potable groundwater, livestock watering, aquatic life, soil contact, human health ingestion and dermal contact pathways. All groundwater analytical results have been compared to the MOECC Table 3 Standards for commercial land use for non-potable groundwater conditions.

The above evaluation is based on Pinchin's observation of Site conditions at the time of the Phase II ESA. If Site conditions or use of the Site changes in the future, the applicable pathways should be re-evaluated.

# 3.0 RESULTS

## 3.1 Site Geology and Hydrogeology

Based on the soil samples recovered during the borehole drilling program, the soil stratigraphy at the drilling locations below the concrete or asphalt and concrete surface generally consists of fill material comprised of granular and clay fill to a depth between approximately 0.15 and 1.5 mbgs.

Native subsurface material underlying the fill material was observed to generally consist of silt and clay that extended to the maximum borehole completion depth of 4.6 mbgs. Moist to wet soil conditions were generally observed between 0.5 and 4.6 mbgs.

A detailed description of the subsurface stratigraphy encountered during borehole advancement is documented in the borehole logs located in Appendix II.

The water level information obtained during groundwater monitoring is presented in Table 2 and on the borehole logs in Appendix II. The depth to groundwater measured within the monitoring wells ranged from 1.3 mbgs at monitoring well BH2 (MW2) to 4.57 mbgs at monitoring well BH3 (MW3) on December 3, 2015.

The Red River is located approximately 0.5 kilometres (km) east of the Site. The topography of the Site and surrounding area were observed to be flat. Groundwater flow at the Site is inferred to be towards the east based on the location of the Red River.

## 3.2 Soil Headspace Vapour Concentrations

Vapour concentrations measured in the headspace of soil samples collected during the drilling investigation are presented on the borehole logs in Appendix II and ranged from 0 parts per million by volume ($ppm_v$) to a maximum of 51 $ppm_v$ in soil sample BH4-S2 collected at an approximate depth of 1.4 mbgs in borehole BH4 (MW4).

## 3.3 Field Observations

No odours or staining were observed in the soil samples collected during the borehole drilling program, with the exception of soil sample BH2-S2 collected at borehole BH2 (MW2) at an approximate depth of 1.4 mbgs which exhibited PHC-like odours and soil sample BH4-S2 collected at borehole BH4 (MW4) at an approximate depth of 1.4 mbgs which exhibited PHC-like odours.

No odours or evidence of NAPL were observed during groundwater monitoring and sampling, with the exception of the groundwater at monitoring well BH2 (MW2) which exhibited a PHC-like odour.

## 3.4 Analytical

### *3.4.1 Soil*

As indicated in Tables 3 through 6, reported concentrations of BTEX, PHCs (F1-F4), VOCs, PAHs and metals in the soil samples submitted for analysis met the CCME Soil Guidelines with the following exceptions:

- Soil sample BH2-S2 collected at borehole BH2 (MW2) exceeded the CCME Soil Guidelines for PHCs (F2) (1,400 milligrams per kilogram (mg/kg) vs. the CCME Soil Guideline of 1,000 mg/kg); and
- Soil sample BH4-S2 collected at borehole BH4 (MW4) exceeded the CCME Soil Guidelines for PHCs (F2) (1,500 mg/kg) vs. the CCME Soil Guideline of 1,000 mg/kg) that exceeded the CCME Soil Guidelines.

The laboratory Certificate of Analysis for the soil samples is provided in Appendix IV.

### *3.4.2 Groundwater*

As indicated in Tables 7 and 8, reported concentrations in the groundwater samples submitted for analysis of BTEX, PHCs (F1-F4) and VOCs met the MOECC Table 3 Standards, with the following exceptions:

- Groundwater collected from monitoring well BH2 (MW2), which had a concentration of PHCs (F2) (490 micrograms per litre (µg/L) vs. the MOECC Table 3 Standard of 150 µg/L) that exceeded the MOECC Table 3 Standards.
- Groundwater collected from monitoring well BH3 (MW3), which had a concentration of PHCs (F2) (160 µg/L vs. the MOECC Table 3 Standard of 150 µg/L) that exceeded the MOECC Table 3 Standards.

The laboratory Certificate of Analysis for the groundwater samples is provided in Appendix IV.

## 4.0 FINDINGS AND CONCLUSIONS

Based on the work completed, the following is a summary of the activities and findings of this Phase II ESA:

- Pinchin retained Maple Leaf to advance six boreholes on-Site and one borehole off-Site on November 28, 2015. The boreholes were advanced to a maximum depth of 4.6 mbgs using a track mounted drill rig and portable electric drill rig, both equipped with solid stem augers. All of the boreholes were instrumented with monitoring wells to enable groundwater monitoring and sampling.
- The soil stratigraphy at the drilling locations generally consists of fill material comprised of granular and clay fill to a depth between approximately 0.15 and 1.5 mbgs. Native subsurface material underlying the fill material was observed to generally consist of silt and clay that extended to the maximum borehole completion depth of 4.6 mbgs. Moist to wet soil conditions were generally observed between 0.5 and 4.6 mbgs.
- Groundwater levels at the Site measured on December 3, 2015 varied between 1.30 mbgs BH2 (MW2) and 4.57 mbgs BH3 (MW3). Inferred groundwater flow is expected to be east based on the presence of the Red River east of the Site.
- Based on Site-specific information, the soil quality was assessed based on the CCME Guidelines for commercial land use and fine-grained soils excluding the protection of potable groundwater, livestock watering, aquatic life, soil contact, human health ingestion and dermal contact pathways.
- Based on Site-specific information, the groundwater quality was assessed based on the MOECC Table 3 Standards for commercial land use, fine-grained soils for non-potable groundwater conditions.
- Nine “worst case” soil samples based on the results of field screening were submitted for a combination of laboratory analysis of BTEX, PHCs (F1-F4), VOCs, PAHs and/or metals.
- Groundwater samples were collected from monitoring wells BH1 (MW1), BH2 (MW2), BH3 (MW3), BH4 (MW4) and BH5 (MW5) installed by Pinchin on December 3, 2015 and were submitted for a combination of laboratory analysis of BTEX, PHCs (F1-F4) and VOCs.

- Reported concentrations in the soil samples submitted for analysis of BTEX, PHCs (F1-F4), VOCs, PAHs and/or metals satisfied their respective CCME Soil Guidelines, with the following exceptions:
  - Soil sample BH2-S2 collected at borehole BH2(MW2) exceeded the CCME Soil Guideline for PHCs (F2); and
  - Soil sample BH4-S2 collected at borehole BH4 (MW4) exceeded the CCME Soil Guidelines for PHCs (F2).
- Reported concentrations in the groundwater samples submitted for analysis of BTEX, PHCs (F1-F4) and VOCs satisfied their respective MOECC Table 3 Standards, with the following exception:
  - The groundwater sample collected at monitoring well BH2 (MW2) exceeded the MOECC Table 3 Standard for PHCs (F2).
  - The groundwater sample collected at monitoring well BH3 (MW3) exceeded the MOECC Table 3 Standard for PHCs (F2).

Based on the findings of this Phase II ESA, Pinchin recommends that additional boreholes be completed at the Site to delineate the extent of soil and groundwater impacts at the Site.

As of April 1, 2014, new amendments to the Contaminated Sites Remediation Act (CSRA) and Contaminated Sites Remediation Regulation (CSRR) came into effect. Section 3.1 of the CSRA states that the owner or occupier of a site must notify Manitoba Conservation in writing when he or she becomes aware of information that indicates that the site has been contaminated at a level that exceeds a standard established or adopted by regulation (in this case the CSRR) and provide Manitoba Conservation and with all reports and any other documentation in his or her possession respecting the contamination at the Site.

## 5.0 LIMITATIONS

This Phase II ESA was performed for MMI Asset Management Ltd. (Client) in order to investigate potential environmental impacts at 195 Fort Street in Winnipeg, Manitoba (Site). The term recognized environmental condition means the presence or likely presence of any hazardous substance on a property under conditions that indicate an existing release, past release, or a material threat of a release of a hazardous substance into structures on the property or into the ground, groundwater, or surface water of the property. This Phase II ESA does not quantify the extent of the current and/or recognized environmental condition or the cost of any remediation.

Conclusions derived are specific to the immediate area of study and cannot be extrapolated extensively away from sample locations. Samples have been analyzed for a limited number of contaminants that are expected to be present at the Site, and the absence of information relating to a specific contaminant does not indicate that it is not present.

No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions on a property. Performance of this Phase II ESA to the standards established by Pinchin is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions on the Site, and recognizes reasonable limits on time and cost.

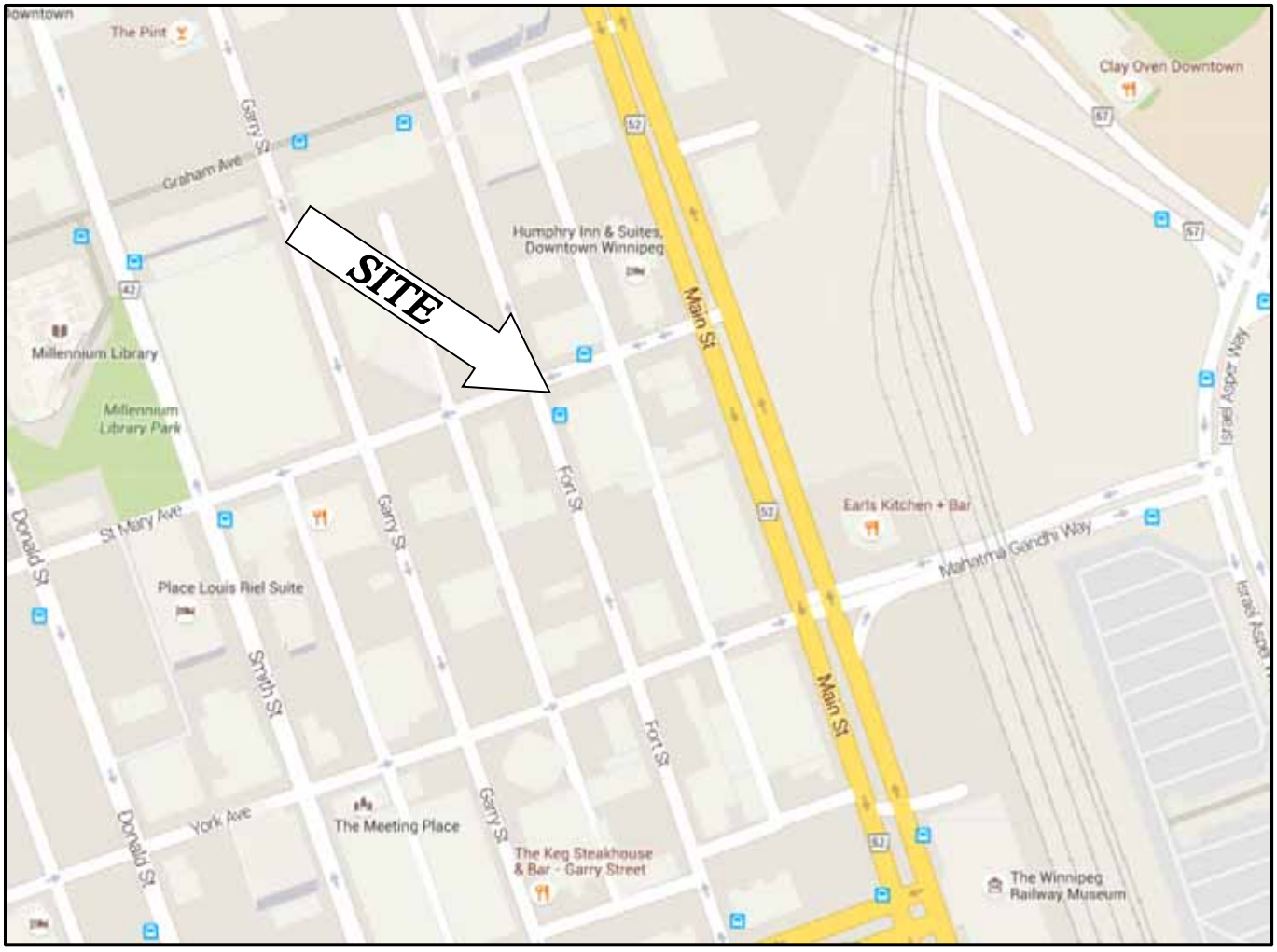
This Phase II ESA was performed in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site.

This report was prepared for the exclusive use of the Client, subject to the conditions and limitations contained within the duly authorized proposal. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third parties. If additional parties require reliance on this report, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this report should not be construed as legal advice.

Pinchin will not be responsible for any consequential or indirect damages. Pinchin will only be liable for damages resulting from the negligence of Pinchin. Pinchin will not be liable for any losses or damage if the Client has failed, within a period of two years following the date upon which the claim is discovered (Claim Period), to commence legal proceedings against Pinchin to recover such losses or damage unless the laws of the jurisdiction which governs the Claim Period which is applicable to such claim provides that the applicable Claim Period is greater than two years and cannot be abridged by the contract between the Client and Pinchin, in which case the Claim Period shall be deemed to be extended by the shortest additional period which results in this provision being legally enforceable.

Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

# APPENDIX I
## Figures




PINCHIN

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|---|---|---|---|
| PROJECT NAME: PHASE II ENVIRONMENTAL SITE ASSESSMENT | | | |
| CLIENT NAME: MMI ASSET MANAGEMENT LTD. | | | |
| PROJECT LOCATION: 195 FORT STREET, WINNIPEG, MANITOBA | | | |
| FIGURE NAME: KEY MAP | | | FIGURE NO.: 1 |
| APPROXIMATE SCALE: NOT SHOWN | PROJECT NO.: 110069.001 | DATE: JANUARY 2016 | |


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|---|---|---|---|
| PROJECT NAME: PHASE II ENVIRONMENTAL SITE ASSESSMENT | | | |
| CLIENT NAME: MMI ASSET MANAGEMENT LTD. | | | |
| PROJECT LOCATION: 195 FORT STREET, WINNIPEG, MANITOBA | | | |
| FIGURE NAME: BOREHOLE AND MONITORING WELL LOCATION PLAN | | | FIGURE NO.: 2 |
| APPROXIMATE SCALE: AS SHOWN | PROJECT NO.: 110069.001 | DATE: JANUARY 2016 | |

**APPENDIX II**

**Borehole Logs**

# Log of Borehole: BH1 (MW1)

**Project #:** 110069.001 **Logged By:** SPM

**Project:** Phase II Environmental Site Assessment

**Client:** MMI Asset Management Ltd.

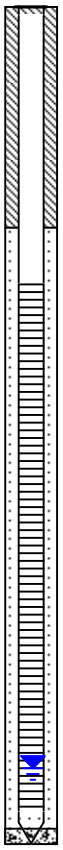
**Location:** 195 Fort Street, Winnipeg, MB

**Drill Date:** November 28, 2015 **Project Manager:** GEE

## SUBSURFACE PROFILE

| Depth (ft) | Depth (m) | Symbol | Description | Measured Depth (m) |
|---|---|---|---|---|
| 0 | 0 | | Ground Surface | 0.00 |
| | | | ***Concrete*** | 0.15 |
| 1 | | | ***Granular Fill*** | |
| 2 | | | Brown, sand, stones, silt, frost | 0.61 |
| 3 | 1 | | ***Clay Fill*** | |
| 4 | | | Black, silt, stones, moist | |
| 5 | | | | 1.52 |
| 6 | 2 | | ***Clay*** | |
| 7 | | | Brown, Silt, moist | |
| 8 | | | | |
| 9 | | | | |
| 10 | 3 | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | 4 | | | |
| 14 | | | | |
| 15 | | | | 4.60 |
| 16 | 5 | | End of Borehole | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | 6 | | | |

Monitoring Well Details



## SAMPLE

| Sampler # | Recovery (%) | Sample ID | Soil Vapour Concentration PID/CGI | Laboratory Analysis |
|---|---|---|---|---|
| 1 | 100 | S1 | 0/0 | |
| 2 | 100 | S2 | 0/0 | |
| 3 | 100 | S3 | 0/0 | BTEX, PHCs (F1-F4), VOCs |
| 4 | 100 | S4 | 0/0 | |
| 5 | 100 | S5 | 0/0 | |
| 6 | 100 | S6 | 0/0 | |

**Contractor:** Maple Leaf Drilling Ltd.

**Drilling Method:** Solid Stem Auger

**Well Casing Size:** 5.1 cm


***Pinchin Ltd.***

***54 Terracon Place***

***Winnipeg, MB R2J 4G7***


**Grade Elevation:** NM

**Top of Casing Elevation:** NM

# Log of Borehole: BH2 (MW2)

**Project #:** 110069.001 **Logged By:** SPM

**Project:** Phase II Environmental Site Assessment

**Client:** MMI Asset Management Ltd.

**Location:** 195 Fort Street, Winnipeg, MB

**Drill Date:** November 28, 2015 **Project Manager:** GEE

| SUBSURFACE PROFILE | | | | | SAMPLE | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Depth (ft / m) | Symbol | Description | Measured Depth (m) | Monitoring Well Details | Sampler # | Recovery (%) | Sample ID | Soil Vapour Concentration PID/CGI | Laboratory Analysis |
| 0 / 0 | | Ground Surface | 0.00 | | | | | | |
| | | ***Asphalt*** | | | | | | | |
| 1 | | ***Granular Fill***<br>Brown, sand, stones, silt, frost | 0.46 | | | | | | |
| 2 | | ***Clay Fill***<br>Grey, silt, stones, moist | | | 1 | 100 | S1 | 0/0 | Metals |
| 3 / 1 | | | 1.07 | | | | | | |
| 4 | | ***Silty Clay***<br>Grey, moist | 1.37 | | 2 | 100 | S2 | 10/8 | BTEX, PHCs (F1-F4), VOCs |
| 5 | | ***Silt***<br>Grey, wet, PHC-like odour | 1.68 | | | | | | |
| 6 / 2 | | ***Clay***<br>Brown, silt, moist, no odour | | | 3 | 100 | S3 | 5/0 | |
| 7 | | | | | | | | | |
| 8 | | | | | 4 | 100 | S4 | 0/0 | |
| 9 | | | | | | | | | |
| 10 / 3 | | | | | 5 | 100 | S5 | 0/0 | |
| 11 | | | | | | | | | |
| 12 | | | | | 6 | 100 | S6 | 0/0 | |
| 13 / 4 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | 4.60 | | | | | | |
| 16 / 5 | | End of Borehole | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 / 6 | | | | | | | | | |

**Contractor:** Maple Leaf Drilling Ltd.

**Drilling Method:** Solid Stem Auger

**Well Casing Size:** 5.1 cm

***Pinchin Ltd.***
***54 Terracon Place***
***Winnipeg, MB R2J 4G7***

**Grade Elevation:** NM

**Top of Casing Elevation:** NM

**Sheet:** 1 of 1

# Log of Borehole: BH3 (MW3)

**Project #:** 110069.001 **Logged By:** SPM

**Project:** Phase II Environmental Site Assessment

**Client:** MMI Asset Management Ltd.

**Location:** 195 Fort Street, Winnipeg, MB

**Drill Date:** November 28, 2015 **Project Manager:** GEE

| SUBSURFACE PROFILE | | | | | SAMPLE | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Depth (ft / m) | Symbol | Description | Measured Depth (m) | Monitoring Well Details | Sampler # | Recovery (%) | Sample ID | Soil Vapour Concentration PID/CGI | Laboratory Analysis |
| 0 / 0 | | Ground Surface | 0.00 | | | | | | |
| | | ***Asphalt*** | | | | | | | |
| 1 | | ***Granular Fill*** | 0.46 | | | | | | BTEX, PHCs, (F1-F4), VOCs, PAHS, metals |
| 2 | | Brown, sand, stones, silt, frost | | | 1 | 100 | S1 | 35/0 | |
| 3 / 1 | | ***Clay Fill*** Grey, silt, stones, wood debris, moist | | | | | | | |
| 4 | | | | | 2 | 100 | S2 | 10/14 | |
| 5 | | | 1.68 | | | | | | |
| 6 / 2 | | ***Clay*** Brown, silt, moist | | | 3 | 100 | S3 | 0/0 | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | 4 | 100 | S4 | 0/0 | |
| 10 / 3 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | 5 | 100 | S5 | 0/0 | |
| 13 / 4 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | 4.60 | | 6 | 100 | S6 | 0/0 | |
| 16 / 5 | | End of Borehole | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 / 6 | | | | | | | | | |

**Contractor:** Maple Leaf Drilling Ltd.

**Drilling Method:** Solid Stem Auger

**Well Casing Size:** 5.1 cm

***Pinchin Ltd.***
***54 Terracon Place***
***Winnipeg, MB R2J 4G7***

**Grade Elevation:** NM

**Top of Casing Elevation:** NM

**Sheet:** 1 of 1

# Log of Borehole: BH4 (MW4)

**Project #:** 110069.001 **Logged By:** SPM

**Project:** Phase II Environmental Site Assessment

**Client:** MMI Asset Management Ltd.

**Location:** 195 Fort Street, Winnipeg, MB

**Drill Date:** November 28, 2015 **Project Manager:** GEE

## SUBSURFACE PROFILE

## SAMPLE

| Depth (ft) | Depth (m) | Symbol | Description | Measured Depth (m) | Monitoring Well Details | Sampler # | Recovery (%) | Sample ID | Soil Vapour Concentration PID/CGI | Laboratory Analysis |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | Ground Surface | 0.00 | | | | | | |
| 1 | | | ***Asphalt*** | | | | | | | |
| | | | ***Granular Fill*** | 0.46 | | | | | | |
| 2 | | | Brown, sand, stones, silt, frost | | | 1 | 100 | S1 | 0/6 | |
| 3 | 1 | | ***Clay Fill*** Grey, silt, stones, moist, PHC-like odour | | | | | | | |
| 4 | | | | | | 2 | 100 | S2 | 0/51 | BTEX, PHCs, (F1-F4), VOCs, PAHs, metals |
| 5 | | | | 1.68 | | | | | | |
| 6 | 2 | | ***Clay*** Brown, silt, moist, no odour | | | 3 | 100 | S3 | 0/1 | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | 4 | 100 | S4 | 0/0 | |
| 10 | 3 | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | 5 | 100 | S5 | 0/0 | |
| 13 | 4 | | | | | | | | | |
| 14 | | | | | | 6 | 100 | S6 | 0/0 | |
| 15 | | | | 4.60 | | | | | | |
| 16 | 5 | | End of Borehole | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | 6 | | | | | | | | | |

**Contractor:** Maple Leaf Drilling Ltd.

**Drilling Method:** Solid Stem Auger

**Well Casing Size:** 5.1 cm

***Pinchin Ltd.***
***54 Terracon Place***
***Winnipeg, MB R2J 4G7***

**Grade Elevation:** NM

**Top of Casing Elevation:** NM

**Sheet:** 1 of 1

# Log of Borehole: BH5 (MW5)

**Project #:** 110069.001 **Logged By:** SPM

**Project:** Phase II Environmental Site Assessment

**Client:** MMI Asset Management Ltd.

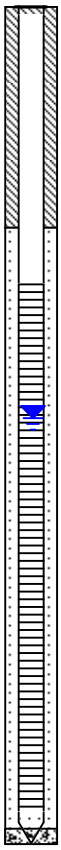
**Location:** 195 Fort Street, Winnipeg, MB

**Drill Date:** November 28, 2015 **Project Manager:** GEE

## SUBSURFACE PROFILE

| Depth (ft) | Depth (m) | Symbol | Description | Measured Depth (m) |
|---|---|---|---|---|
| 0 | 0 | | Ground Surface | 0.00 |
| | | | ***Concrete*** | 0.27 |
| 1 | | | ***Void*** | 0.43 |
| 2 | | | ***Clay Fill*** Grey, silt, stones, wood debris, moist | 0.61 |
| 3 | 1 | | | |
| 4 | | | ***Silt*** Brown, moist | 1.37 |
| 5 | | | ***Clay*** Brown, silt, moist | |
| 6 | 2 | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | 3 | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | 4 | | | |
| 14 | | | | |
| 15 | | | | 4.60 |
| 16 | 5 | | End of Borehole | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | 6 | | | |

Monitoring Well Details



## SAMPLE

| Sampler # | Recovery (%) | Sample ID | Soil Vapour Concentration PID/CGI | Laboratory Analysis |
|---|---|---|---|---|
| 1 | 100 | S1 | 10/0 | |
| 2 | 100 | S2 | 0/0 | |
| 3 | 100 | S3 | 35/0 | BTEX, PHCs, (F1-F4), VOCs |
| 4 | 100 | S4 | 35/0 | |
| 5 | 100 | S5 | 20/0 | |
| 6 | 100 | S6 | 10/0 | |

**Contractor:** Maple Leaf Drilling Ltd.

**Drilling Method:** Solid Stem Auger

**Well Casing Size:** 5.1 cm

***Pinchin Ltd.***
***54 Terracon Place***
***Winnipeg, MB R2J 4G7***

**Grade Elevation:** NM

**Top of Casing Elevation:** NM

**Sheet:** 1 of 1

# Log of Borehole: BH6 (MW6)

**Project #:** 110069.001 **Logged By:** SPM

**Project:** Phase II Environmental Site Assessment

**Client:** MMI Asset Management Ltd.

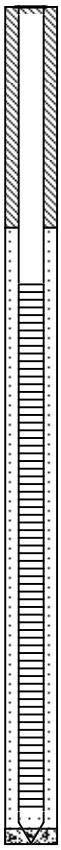
**Location:** 195 Fort Street, Winnipeg, MB

**Drill Date:** November 28, 2015 **Project Manager:** GEE

## SUBSURFACE PROFILE

| Depth (ft) | Depth (m) | Description | Measured Depth (m) |
|---|---|---|---|
| 0 | 0 | Ground Surface | 0.00 |
| | | ***Tile*** | 0.21 |
| 1 | | ***Concrete*** | 0.37 |
| 2 | | ***Void*** | |
| 3 | 1 | ***Granular Fill*** Brown, sand, stones, wood debris, moist | 1.07 |
| 4 | | ***Silt*** Brown, moist | |
| 5 | | | |
| 6 | 2 | | 1.83 |
| 7 | | ***Clay*** Brown, silt, moist | |
| 8 | | | |
| 9 | | | |
| 10 | 3 | | |
| 11 | | | |
| 12 | | | |
| 13 | 4 | | |
| 14 | | | |
| 15 | | | 4.60 |
| 16 | 5 | End of Borehole | |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | 6 | | |

Monitoring Well Details



## SAMPLE

| Sampler # | Recovery (%) | Sample ID | Soil Vapour Concentration PID/CGI | Laboratory Analysis |
|---|---|---|---|---|
| 1 | 100 | S1 | 10/0 | |
| 2 | 100 | S2 | 0/0 | |
| 3 | 100 | S3 | 35/0 | |
| 4 | 100 | S4 | 35/0 | |
| 5 | 100 | S5 | 20/0 | BTEX, PHCs, (F1-F4), VOCs |
| 6 | 100 | S6 | 10/0 | |

**Contractor:** Maple Leaf Drilling Ltd.

**Drilling Method:** Solid Stem Auger

**Well Casing Size:** 5.1 cm

***Pinchin Ltd.***
***54 Terracon Place***
***Winnipeg, MB R2J 4G7***

**Grade Elevation:** NM

**Top of Casing Elevation:** NM

**Sheet:** 1 of 1

# Log of Borehole: BH7 (MW7)

**Project #:** 110069.001 **Logged By:** SPM

**Project:** Phase II Environmental Site Assessment

**Client:** MMI Asset Management Ltd.

**Location:** 195 Fort Street, Winnipeg, MB

**Drill Date:** November 28, 2015 **Project Manager:** GEE

| SUBSURFACE PROFILE | | | | | SAMPLE | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Depth (ft / m) | Symbol | Description | Measured Depth (m) | Monitoring Well Details | Sampler # | Recovery (%) | Sample ID | Soil Vapour Concentration PID/CGI | Laboratory Analysis |
| 0 / 0 | | Ground Surface | 0.00 | | | | | | |
| | | ***Concrete*** | 0.21 | | | | | | |
| 1 | | ***Void*** | 0.37 | | | | | | |
| 2 / 1 | | ***Clay Fill*** Grey, silt, stones, wood debris, moist | | | 1 | 100 | S1 | 10/0 | |
| 5 | | | 1.68 | | 2 | 100 | S2 | 0/0 | |
| 6 / 2 | | ***Silty Clay*** Brown, moist | | | 3 | 100 | S3 | 35/0 | |
| 7 | | | 2.13 | | | | | | |
| 8 | | ***Clay*** Brown, silt, moist | | | 4 | 100 | S4 | 35/0 | |
| 10 / 3 | | | | | | | | | |
| 11 | | | | | 5 | 100 | S5 | 20/0 | BTEX, PHCs, (F1-F4), VOCs |
| 13 / 4 | | | | | | | | | |
| 14 | | | | | 6 | 100 | S6 | 10/0 | |
| 15 | | | 4.60 | | | | | | |
| | | End of Borehole | | | | | | | |
| 16 / 5 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 / 6 | | | | | | | | | |
| 20 | | | | | | | | | |

**Contractor:** Maple Leaf Drilling Ltd.

**Drilling Method:** Solid Stem Auger

**Well Casing Size:** 5.1 cm

***Pinchin Ltd.***
***54 Terracon Place***
***Winnipeg, MB R2J 4G7***

**Grade Elevation:** NM

**Top of Casing Elevation:** NM

**Sheet:** 1 of 1

## APPENDIX III

## Summary Tables

**Table 1**
**Samples Submitted for Laboratory Analysis**
**Phase II Environmental Site Assessment**
**195 Fort Street**
**Winnipeg, MB**

| *Samples* | | | *Parameters* | | | | | | | | | | | | | | *Rationale* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **SOIL SAMPLES** | | | | | | | | **GROUNDWATER SAMPLES** | | | | | | |
| ***Sample Location*** | ***Sample Identifier*** | ***Sample Depth (mbgs)*** | PHCs (F1 - F4) | BTEX | Metals | VOCs | PAHs | Grain Size Analysis | Lead Analysis | | PHCs (F1 - F4) | BTEX | VOCs | PAHs | Metals | |
| BH1 (MW1) | BH1-S3 | 2.25 | ● | ● | | ● | | | | | | | | | | Assess soil conditions in relation to historical off-Site suspect dry cleaning operation. |
| | MW1 | – | | | | | | | | | ● | ● | ● | | | Assess groundwater conditions in relation to historical off-Site suspect dry cleaning operation. |
| BH2 (MW2) | BH2-S1 | 0.75 | | | ● | | | | | | | | | | | Assess soil conditions in relation to historical residential dwelling and automotive servicing operations. |
| | BH2-S2 | 1.4 | ● | ● | | ● | | | | | | | | | | Assess soil conditions in relation to historical residential dwelling and automotive servicing operations. |
| | MW2 | – | | | | | | | | | ● | ● | ● | | | Assess groundwater conditions in relation to historical residential dwelling and automotive servicing operations. |
| BH3 (MW3) | BH3-S1 | 0.60 | ● | ● | ● | ● | ● | | | | | | | | | Assess soil conditions in relation to historical automotive servicing operations. |
| BH4 (MW4) | BH4-S2 | 1.4 | ● | ● | ● | ● | ● | | | | | | | | | Assess soil conditions in relation to historical automotive servicing operations. |
| BH5 (MW5) | BH5-S1 | 0.75 | | | ● | | | | | | | | | | | Assess soil conditions in relation to historical automotive servicing operations. |
| | BH5-S3 | 2.15 | ● | ● | | ● | | | | | | | | | | Assess soil conditions in relation to historical automotive servicing operations. |
| | MW5 | – | | | | | | | | | ● | ● | ● | | | Assess groundwater conditions in relation to historical automotive servicing operations. |
| BH6 (MW6) | BH6-S5 | 3.35 | ● | ● | | ● | | | | | | | | | | Assess soil conditions in relation to historical automotive servicing operations. |
| BH7 (MW7) | BH7-S5 | 3.5 | ● | ● | | ● | | | | | | | | | | Assess soil conditions in relation to historical automotive servicing operations. |

**Notes:**

mbgs Metres Below Ground Surface
PHCs Petroleum Hydrocarbons
BTEX Benzene, Toluene, Ethylbenzene, and Xylenes
PAH Polycyclic Aromatic Hydrocarbons
VOCs Volatile Organic Compounds

**Table 2**
**Groundwater Level Data**
**Phase II Environmental Site Assessment**
**195 Fort Street**
**Winnipeg, MB**

| Well Number | Date (dd/mm/yyyy) | NAPL Level Measurement from TOC (m) | Water Level Measurement from TOC (m) | Water Level Measurement from Ground (mbgs) | Product Thickness (m) |
|---|---|---|---|---|---|
| BH1 (MW1) | 1/12/2015 | ND | 3.9 | 4.10 | ND |
| BH2 (MW2) | 1/12/2015 | ND | 1.46 | 1.56 | ND |
| BH3 (MW3) | 1/12/2015 | ND | DRY | DRY | ND |
| BH4 (MW4) | 1/12/2015 | ND | DRY | DRY | ND |
| BH5 (MW5) | 1/12/2015 | ND | 2.37 | 2.47 | ND |
| BH6 (MW6) | 1/12/2015 | ND | DRY | DRY | ND |
| BH7 (MW7) | 1/12/2015 | ND | DRY | DRY | ND |
| BH1 (MW1) | 3/12/2015 | ND | 4.11 | 4.21 | ND |
| BH2 (MW2) | 3/12/2015 | ND | 3.07 | 3.17 | ND |
| BH3 (MW3) | 3/12/2015 | ND | 4.47 | 4.57 | ND |
| BH4 (MW4) | 3/12/2015 | ND | DRY | DRY | ND |
| BH5 (MW5) | 3/12/2015 | ND | 2.16 | 2.26 | ND |
| BH6 (MW6) | 3/12/2015 | ND | DRY | DRY | ND |
| BH7 (MW7) | 3/12/2015 | ND | 4.45 | 4.55 | ND |
| BH3 (MW3) | 29/12/2015 | ND | 3.72 | 3.82 | ND |
| BH4 (MW4) | 29/12/2015 | ND | 3.84 | 3.94 | ND |

**Notes:**

NAPL Non-Aqueous Phase Liquid
ND Not Detected
TOC Indicates Top of Casing
m Metres
mbgs Metres Below Ground Surface

**Table 3**
**Petroleum Hydrocarbon and BTEX Analysis for Soil**
**Phase II Environmental Site Assessment**
**195 Fort Street**
**Winnipeg, MB**

| Parameter | | Sample Identification | | | | | | | CCME Guidelines [a] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | BH1-S3 | BH2-S2 | BH3-S1 | BH4-S2 | BH5-S3 | BH6-S5 | BH7-S5 | Surface (<1.5 mbgs) | Subsoil (>1.5 mbgs) |
| | | 2.25 mbgs | 1.4 mbgs | 0.6 mbgs | 1.4 mbgs | 2.15 mbgs | 3.35 mbgs | 3.5 mbgs | | |
| BETX | Benzene | <0.0050 | <0.0050 | 0.026 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | 2.8[a] | 2.9[b] |
| | Toluene | <0.020 | <0.020 | <0.030 | <0.020 | <0.020 | <0.020 | <0.020 | 330[a] | 660[b] |
| | Ethylbenzene | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 430[a] | 860[b] |
| | Xylenes | <0.040 | <0.040 | <0.040 | <0.040 | <0.040 | <0.040 | <0.040 | 230[a] | 460[b] |
| PHCs | F1 (C6-C10) | <10 | 95 | <10 | 190 | <10 | <10 | <10 | 800[c] | 800[d] |
| | F2 (C10-C16) | <20 | **1,400** | 31 | **1,500** | <20 | <20 | <20 | 1,000[c] | 1,000[d] |
| | F3 (C16-C34) | 27 | 430 | 260 | 380 | 25 | 30 | 26 | 5,000[c] | 5,000[d] |
| | F4 (C34-C50) | <20 | <20 | 1,200 | <20 | <20 | <20 | <20 | 10,000[c] | 10,000[d] |
| | Methyl-tert-butylether (MTBE) | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | NG | NG |

**Note:**

- All concentrations in miligrams per kilogram (mg/kg) unless otherwise noted
- BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
- PHCs = Petroleum Hydrocarbons
- < = concentration is less than the laboratory's minimum reportable detection limit
- BH1-S3 = sample was collected from Borehole 1, Sample Number 3
- 2.25 mbgs = sample was collected at 2.25 metres below ground surface
- CCME = Canadian Council of the Ministers of the Environment
- [a] Referenced from the CCME Canadian Environmental Quality Guidelines, Accessed On-Line in December, 2015
- Data represents the most stringent criteria for commercial land-use, fine-grained surface soils excluding the protection of potable water, livestock watering and aquatic life
- [b] Referenced from the CCME Canadian Environmental Quality Guidelines, Accessed On-Line in Decmber, 2015
- Data represents the most stringent criteria for commercial land-use, fine-grained subsoils excluding the protection of potable water, livestock watering and aquatic life
- [c] Referenced from the CCME Canada-Wide Standards for Petroleum Hydrocarbons in Soil, 2008
- Data represents the most stringent criteria for commercial land-use, fine-grained surface soils excluding the protection of potable water, livestock watering, aquatic life, soil contact, human health ingestion and dermal contact pathways
- [d] Referenced from the CCME Canada-Wide Standards for Petroleum Hydrocarbons in Soil, 2008
- Data represents the most stringent criteria for commercial land-use, fine-grained subsoils excluding the protection of potable water, livestock watering, aquatic life, soil contact, human health ingestion and dermal contact pathways
- Concentrations in **BOLD** print indicates concentration exceeds referenced guideline

**Table 4**
**Volatile Organic Compound Analysis for Soil**
**Phase II Environmental Site Assessment**
**195 Fort Street**
**Winnipeg, MB**

| Parameter | Sample Identification | | | | | | | CCME Guideline [a] |
|---|---|---|---|---|---|---|---|---|
| | BH1-S3 | BH2-S2 | BH3-S1 | BH4-S2 | BH5-S3 | BH6-S5 | BH7-S5 | |
| | 2.25 mbgs | 1.4 mbgs | 0.6 mbgs | 1.4 mbgs | 2.15 mbgs | 3.35 mbgs | 3.5 mbgs | |
| 1,1,1,2-Tetrachloroethane | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | NG |
| 1,1,1-Trichloroethane | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 50 |
| 1,1,2,2-Tetrachloroethane | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 50 |
| 1,1,2-Trichloroethane | <0.025 | 0.037 | <0.025 | <0.22 | <0.025 | <0.025 | <0.025 | 50 |
| 1,1-Dichloroethane | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 50 |
| 1,1-Dichloroethene | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 50 |
| 1,2,3-Trichlorobenzene | <0.025 | 0.19 | <0.025 | <0.64 | <0.025 | <0.025 | <0.025 | 10 |
| 1,2,4-Trichlorobenzene | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 10 |
| 1,2-Dibromoethane | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 50 |
| 1,2-Dichlorobenzene | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 10 |
| 1,2-Dichloroethane | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 50 |
| 1,2-Dichloropropane | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 50 |
| 1,3-Dichlorobenzene | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 10 |
| 1,4-Dichlorobenzene | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 10 |
| Bromodichloromethane | <0.050 | <0.050 | <0.050 | <0.21 | <0.050 | <0.050 | <0.050 | NG |
| Bromoform | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 50 |
| Bromomethane | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | NG |
| Carbon Tetrachloride | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 50 |
| Chlorobenzene | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | NG |
| Chlorodibromomethane | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | NG |
| Chloroethane | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 50 |
| Chloroform | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 50 |
| Chloromethane | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | NG |
| cis-1,2-Dichloroethene | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 0.5 |
| cis-1,3-Dichloropropene | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 50 |
| Dichloromethane | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 50 |
| Hexachlorobutadiene | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | NG |
| Styrene | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | 50 |
| Tetrachloroethene | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 0.5 |
| trans-1,2-Dichloroethene | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 10 |
| trans-1,3-Dichloropropene | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 10 |
| Trichloroethene | <0.0090 | <0.0090 | <0.0090 | <0.0090 | <0.0090 | <0.0090 | <0.0090 | 0.16 |
| Trichlorofluoromethane | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | NG |
| Vinyl Chloride | <0.060 | <0.060 | <0.060 | <0.060 | <0.060 | <0.060 | <0.060 | 10 |

**Note:**

- All concentrations in miligrams per kilogram (mg/kg) unless otherwise noted
- VOCs = Volatile Organic Compounds
- NG = no guideline for corresponding parameter
- < = concentration is less than the laboratory's minimum reportable detection limit
- BH1-S3 = sample was collected from Borehole 1, Sample Number 3
- 2.25 mbgs = sample was collected from 2.25 metres below ground surface
- CCME = Canadian Council of the Ministers of the Environment
- [a] Referenced from the CCME Canadian Environmental Quality Guidelines, Accessed On-Line in September, 2015
- Data represents the most stringent criteria for commercial land-use excluding the protection of potable water and freshwater life
- Concentrations in **BOLD** print indicates concentration exceeds referenced guideline

**Table 5**
**Polycyclic Aromatic Hydrocarbon Analysis for Soil**
**Phase II Environmental Site Assessment**
**195 Fort Street**
**Winnipeg, MB**

| Parameter | Sample Identification | | | CCME Guideline [a] |
|---|---|---|---|---|
| | BH2-S2 | BH3-S1 | BH4-S2 | |
| | 1.4 mbgs | 0.6 mbgs | 1.4 mbgs | |
| Benzo(a)Pyrene Equivalency[b] | 0.04 | 2.14 | 0.04 | 5.3 |
| 2-Methylnaphthalene | <0.023 | 0.086 | 24 | NG |
| Acenaphthene | <0.16 | 0.30 | 1.4 | NG |
| Acenaphthylene | <0.0050 | 0.073 | <0.048 | 320 |
| Anthracene | <0.040 | 0.71 | 0.35 | 32 |
| Benzo(a)anthracene | <0.020 | 1.6 | <0.020 | 10 |
| Benzo(a)pyrene | <0.020 | 1.4 | <0.020 | 1.4 |
| Benzo(b&j)fluoranthene | <0.020 | 1.9 | <0.020 | NG |
| Benzo(b)fluoranthene | <0.020 | 1.2 | <0.020 | 10 |
| Benzo(g,h,i)perylene | <0.050 | 0.85 | <0.050 | NG |
| Benzo(k)fluoranthene | <0.020 | 0.65 | <0.020 | 10 |
| Chrysene | <0.020 | 1.6 | <0.020 | NG |
| Dibenz(a,h)anthracene | <0.050 | 0.22 | <0.050 | 10 |
| Fluoranthene | <0.020 | 3.8 | 0.045 | 180 |
| Fluorene | <0.19 | 0.36 | 1.8 | NG |
| Indeno(1,2,3-cd)pyrene | <0.050 | 0.78 | <0.050 | 10 |
| Naphthalene | <0.026 | 0.18 | 3.0 | 22 |
| Phenanthrene | 0.17 | 2.8 | 2.0 | 50 |
| Pyrene | <0.020 | 3.3 | 0.025 | 100 |
| Low Molecular Weight PAHs | <0.19 | 4.6 | 32 | NG |
| High Molecular Weight PAHs | <0.050 | 16 | 0.071 | NG |
| Total PAH | <0.19 | 21 | 32 | NG |

**Note:**

- All concentrations in miligrams per kilogram (mg/kg) unless otherwise noted
- PAHs = Polycyclic Aromatic Hydrocarbons
- NG = no guideline for corresponding parameter
- < = concentration is less than the laboratory's minimum reportable detection limit
- BH2-S2 = sample was collected from Borehole 2, Sample Number 2
- 1.4 mbgs = sample was collected from 1.4 metres below ground surface
- CCME = Canadian Council of the Ministers of the Environment
- [a] Referenced from the CCME Canadian Environmental Soil Quality Guidelines for the Protection of Environmental and Human Health Polycyclic Aromatic Hydrocarbons, dated 2010 Value listed represents the most stringent criteria for commercial properties excluding protection of potable water and freshwater life
- [b] Benzo(a)pyrene Total Potency Equivalents is calculated by summing the products of the detectable levels of following paramters by their respective Benzo(a)pyrene Equivalnecy Factor : Benzo(a)anthracene (0.1), Benzo(a)pyrene (1), Benzo(b+j)fluoranthene (0.1), Benzo(k)fluoranthene (0.1), Benzo(g,h,i)perylene (0.01), Chrysene (0.01), Dibenz(a,h)anthracene (1) and Indeno(1,2,3-c,d)pyrene (0.1)
- Concentrations in **BOLD** print indicates concentration exceeds referenced guideline

**Table 6**
**Metals and pH Analysis for Soil**
**Phase II Environmental Site Assessment**
**195 Fort Street**
**Winnipeg, MB**

| Parameter | Sample Identification | | | | CCME Guideline [a] |
|---|---|---|---|---|---|
| | BH2-S1 | BH3-S1 | BH4-S2 | BH5-S1 | |
| | 0.75 mbgs | 0.6 mbgs | 1.4 mbgs | 0.75 mbgs | |
| Total Aluminum | 28900 | 16400 | 29000 | 6570 | NG |
| Total Antimony | 0.31 | 2.51 | 0.42 | 0.20 | 40 |
| Total Arsenic | 6.48 | 6.25 | 8.32 | 1.16 | 12 |
| Total Barium | 170 | 192 | 250 | 47.7 | 2000 |
| Total Beryllium | 1.01 | 0.67 | 1.24 | <0.40 | 8 |
| Total Bismuth | 0.23 | 0.18 | 0.27 | <0.10 | NG |
| Total Cadmium | 0.640 | 0.635 | 0.665 | 0.229 | 22 |
| Total Calcium | 38200 | 72100 | 37500 | 110000 | NG |
| Total Chromium | 50.9 | 30.2 | 50.7 | 14.0 | 87 |
| Total Cobalt | 14.2 | 7.74 | 15.5 | 3.28 | 300 |
| Total Copper | 32.0 | 44.9 | 35.9 | 8.67 | 91 |
| Total Iron | 30000 | 19900 | 30700 | 8930 | NG |
| Total Lead | 12.3 | 165 | 15.1 | 5.11 | 260 |
| Total Lithium | 42.5 | 17.3 | 43.0 | 11.3 | NG |
| Total Magnesium | 20900 | 30300 | 19900 | 55300 | NG |
| Total Manganese | 522 | 399 | 520 | 207 | NG |
| Total Mercury | <0.050 | 0.153 | <0.050 | <0.050 | 24 |
| Total Molybdenum | 0.34 | 1.19 | 0.87 | 0.41 | 40 |
| Total Nickel | 41.6 | 22.3 | 46.8 | 10.0 | 89 |
| Total Phosphorus | 535 | 671 | 530 | 402 | NG |
| Total Potassium | 5170 | 3050 | 4780 | 1960 | NG |
| Total Selenium | <0.50 | 0.54 | <0.50 | <0.50 | 2.9 |
| Total Silver | 0.120 | 0.211 | 0.160 | 0.052 | 40 |
| Total Sodium | 498 | 476 | 688 | 327 | NG |
| Total Strontium | 91.6 | 103 | 104 | 54.3 | NG |
| Total Thallium | 0.352 | 0.196 | 0.361 | 0.107 | 1 |
| Total Tin | 0.82 | 10.4 | 0.89 | 0.38 | 300 |
| Total Titanium | 535 | 208 | 286 | 316 | NG |
| Total Uranium | 1.28 | 0.971 | 1.49 | 0.529 | 33 |
| Total Vanadium | 86.4 | 46.2 | 84.6 | 23.6 | 130 |
| Total Zinc | 92.2 | 126 | 94.2 | 21.2 | 360 |
| Total Zirconium | 13.2 | 5.01 | 14.9 | 4.80 | NG |
| pH | **8.67** | **8.51** | **8.93** | **8.67** | 6 to 8 |

**Note:**

- All concentrations in miligrams per kilogram (mg/kg) unless otherwise noted
- mbgs = Meters Below Ground Surface
- NG = no guideline for corresponding parameter
- < = concentration is less than the laboratory's minimum reportable detection limit
- BH2-S1 = sample was collected from borehole 2, Sample Number 1
- 0.75 mbgs = sample was collected at 0.75 metres below ground surface
- CCME = Canadian Council of the Ministers of the Environment
- [a] Referenced from the CCME Canadian Environmental Quality Guidelines, Accessed On-line in September 2015
  Data represents the most stringent criteria for commercial land-use, excluding the protection of potable water and aquatic life
- Concentrations in **BOLD** print indicates concentration exceeds referenced guideline

**Table 7**
**Petroleum Hydrocarbon and BTEX Analyses for Groundwater**
**Phase II Environmental Site Assessment**
**195 Fort Street**
**Winnipeg, MB**

| | Parameter | Sample Identification | | | | | MOECC Guidelines[a] |
|---|---|---|---|---|---|---|---|
| | | MW1 | MW2 | MW3 | MW4 | MW5 | |
| BETX | Benzene | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | 44[b] 430[c] |
| | Toluene | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | 18,000 |
| | Ethylbenzene | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | 2,300 |
| | Xylenes | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | 4,200 |
| PHCs | F1 (C6-C10) | <300 | <300 | <300 | <300 | <300 | 750 |
| | F2 (C10-C16) | <150 | **490** | **160** | <150 | <150 | 150 |
| | F3 (C16-C34) | <150 | <150 | 280 | <200 | <150 | 500 |
| | F4 (C34-C50) | <150 | <150 | <200 | <200 | <150 | 500 |
| | Methyl-tert-butylether (MTBE) | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | 190[b] 1,400[c] |

**Note:**

- All concentrations in micrograms per litre (µg/L) unless otherwise noted
- BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
- PHCs = Petroleum Hydrocarbons
- < = concentration is less than the laboratory's minimum reportable detection limit
- MW1 = sample was collected from Monitoring Well BH1 (MW1)
- [a] Referenced from the Ontario Ministry of the Environment and Climate Control: Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
- [b] Value listed represents the most stringent criteria for all property types, coarse-grained soils excluding protection of potable water (Table 3)
- [c] Value listed represents the most stringent criteria for all property types, fine-grained soils excluding protection of potable water (Table 3)
- Concentrations in **BOLD** print indicates concentration exceeds referenced guideline

**Table 8**
**Voatile Organic Compound Analysis for Groundwater**
**Phase II Environmental Site Assessment**
**195 Fort Street**
**Winnipeg, MB**

| Parameters | MW1 | MW2 | MW5 | MOECC Guidelines[a] |
|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | <0.50 | <0.50 | <0.50 | 3.3[b] 28[c] |
| 1,1,1-Trichloroethane | <0.50 | <0.50 | <0.50 | 640[b] 6,700[c] |
| 1,1,2,2-Tetrachloroethane | <0.50 | <0.50 | <0.50 | 3.2[b] 15[c] |
| 1,1,2Trichloro-1,2,2Trifluoroethane | <2.0 | <2.0 | <2.0 | NG |
| 1,1,2-Trichloroethane | <0.50 | <0.50 | <0.50 | 4.7[b] 30[c] |
| 1,1-Dichloroethane | <0.50 | <0.50 | <0.50 | 320[b] 3,100[c] |
| 1,1-Dichloroethene | <0.50 | <0.50 | <0.50 | 1.6[b] 17[c] |
| 1,2,3-Trichlorobenzene | <2.0 | <2.0 | <2.0 | NG |
| 1,2,4-Trichlorobenzene | <2.0 | <2.0 | <2.0 | 180[b] 850[c] |
| 1,2-Dibromoethane | <0.20 | <0.20 | <0.20 | 0.25[b] 0.83[c] |
| 1,2-Dichlorobenzene | <0.50 | <0.50 | <0.50 | 4,600[b] 9,600[c] |
| 1,2-Dichloroethane | <0.50 | <0.50 | <0.50 | 1.6[b] 12[c] |
| 1,2-Dichloropropane | <0.50 | <0.50 | <0.50 | 16[b] 140[c] |
| 1,3-Dichlorobenzene | <0.50 | <0.50 | <0.50 | 9,600 |
| 1,4-Dichlorobenzene | <0.50 | <0.50 | <0.50 | 8[b] 67[c] |
| Bromodichloromethane | 3.0 | <1.0 | <1.0 | 85,000 |
| Bromoform | <1.0 | <1.0 | <1.0 | 380[b] 770[c] |
| Bromomethane | <1.0 | <1.0 | <1.0 | 5.6[b] 56[c] |
| Carbon Tetrachloride | <0.50 | <0.50 | <0.50 | 0.79[b] 8.4[c] |
| Chlorobenzene | <0.50 | <0.50 | <0.50 | 630 |
| Chlorodibromomethane | <1.0 | <1.0 | <1.0 | 82,000 |
| Chloroethane | <1.0 | <1.0 | <1.0 | NG |
| Chloroform | 20 | <1.0 | <1.0 | 2.4[b] 22[c] |
| Chloromethane | <1.0 | <1.0 | <1.0 | NG |
| cis-1,2-Dichloroethene | <1.0 | <1.0 | <1.0 | 1.6[b] 17[c] |
| cis-1,3-Dichloropropene | <1.0 | <1.0 | <1.0 | NG |
| Dichlorodifluoromethane | <2.0 | <2.0 | <2.0 | 4,400 |
| Dichloromethane | <2.0 | <2.0 | <2.0 | 610[b] 5,500[c] |
| Hexachlorobutadiene | <0.50 | <0.50 | <0.50 | 0.44[b] 4.5[c] |
| Styrene | <0.50 | <0.50 | <0.50 | 1,300[b] 9,100[c] |
| Tetrachloroethene | <0.50 | <0.50 | <0.50 | 1.6[b] 17[c] |
| trans-1,2-Dichloroethene | <1.0 | <1.0 | <1.0 | 1.6[b] 17[c] |
| trans-1,3-Dichloropropene | <1.0 | <1.0 | <1.0 | NG |
| Trichloroethene | <0.50 | <0.50 | <0.50 | 1.6[b] 17[c] |
| Trichlorofluoromethane | <4.0 | <4.0 | <4.0 | 2,500 |
| Vinyl Chloride | <0.50 | <0.50 | <0.50 | 0.5[b] 1.7[c] |

**Note:**

- All concentrations in ug/L or equivalent unless otherwise noted
- VOCs = Volatile Organic Compounds
- NG = No Guideline for corresponding parameter
- < = concentration is less than the laboratory's minimum reportable detection limit
- MW1 = sample was collected from monitoring well BH1 (MW1)
- [a] Referenced from the Ontario Ministry of the Environment and Climate Change: Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
- [b] Value listed represents the most stringent criteria for all property types, coarse-grained soils excluding protection of potable water (Table 3)
- [c] Value listed represents the most stringent criteria for all property types, fine-grained soils excluding protection of potable water (Table 3)
- Concentrations in **BOLD** print indicates concentration exceeds referenced guideline

**APPENDIX IV**

**Laboratory Certificates of Analysis**

Your Project #: 110069.001
Your C.O.C. #: N001799, N000893

**Attention:SEAN MULVEY**

PINCHIN ENVIRONMENTAL LTD
54 Terracon Pl.
Winnipeg, MB
CANADA R2J 4G7

**Report Date: 2015/12/18**
Report #: R2100153
Version: 3 - Revision

# CERTIFICATE OF ANALYSIS – REVISED REPORT

**MAXXAM JOB #: B5A6435**
**Received: 2015/11/30, 13:10**

Sample Matrix: Soil
# Samples Received: 9

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Analytical Method |
|---|---|---|---|---|---|
| BTEX/F1 by HS GC-MS/FID (MeOH extract) (2) | 7 | 2015/12/01 | 2015/12/01 | WINSOP-00054 WINSOP-00055 | EPA8260C/CCME PHCCWS |
| CCME Hydrocarbons (F2-F4 in soil) (3) | 7 | 2015/12/01 | 2015/12/01 | WINSOP-00056 | CCME PHC-CWS |
| CCME Hydrocarbons (F4G in soil) (4) | 1 | 2015/12/04 | 2015/12/04 | WIN SOP-00056 | CCME PHC-CWS |
| Elements by ICPMS (total) (1) | 3 | 2015/12/02 | 2015/12/02 | BBY7SOP-00001 | EPA 6020a R1 m |
| Elements by ICPMS (total) (1) | 1 | 2015/12/03 | 2015/12/03 | BBY7SOP-00001 | EPA 6020a R1 m |
| Moisture | 6 | N/A | 2015/12/02 | WIN SOP-00060 | Carter Method 51.2 |
| Moisture | 1 | N/A | 2015/12/03 | WIN SOP-00060 | Carter Method 51.2 |
| PAH in Soil by GC/MS (SIM) - CCME (1) | 2 | 2015/12/01 | 2015/12/03 | BBY8SOP-00022 | EPA 8270d R4 m |
| PAH in Soil by GC/MS (SIM) - CCME (1) | 1 | 2015/12/17 | 2015/12/17 | BBY8SOP-00022 | EPA 8270d R4 m |
| Benzo[a]pyrene Equivalency (1) | 2 | N/A | 2015/12/03 | BBY WI-00033 | Auto Calc |
| Benzo[a]pyrene Equivalency (1) | 1 | N/A | 2015/12/18 | BBY WI-00033 | Auto Calc |
| Total LMW, HMW, Total PAH Calc (1) | 2 | N/A | 2015/12/03 | BBY WI-00033 | Auto Calc |
| Total LMW, HMW, Total PAH Calc (1) | 1 | N/A | 2015/12/18 | BBY WI-00033 | Auto Calc |
| pH (2:1 DI Water Extract) (1) | 3 | 2015/12/02 | 2015/12/02 | BBY6SOP-00028 | BCMOE BCLM Mar2005 m |
| pH (2:1 DI Water Extract) (1) | 1 | 2015/12/03 | 2015/12/03 | BBY6SOP-00028 | BCMOE BCLM Mar2005 m |
| VOCs, VH, F1, LH in Soil by HS GC/MS (1) | 7 | 2015/12/01 | 2015/12/02 | BBY8-SOP-00009 | EPA 8260c R3 m |

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

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

(1) This test was performed by Maxxam Vancouver

(2) This method complies with the reference method for the CWS PHC and is validated for use in the laboratory.
Applicable only to F1 and/or LH - nC6 and nC10 response factors are within 30% of the toluene response factor.
The hydrocarbon results are expressed as a dry weight basis.

(3) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

(4) This method complies with the reference method for the CWS PHC and is validated for use in the laboratory.
The hydrocarbon results are expressed as a dry weight basis.

Your Project #: 110069.001
Your C.O.C. #: N001799, N000893

**Attention:SEAN MULVEY**

PINCHIN ENVIRONMENTAL LTD
54 Terracon Pl.
Winnipeg, MB
CANADA R2J 4G7

**Report Date: 2015/12/18**
Report #: R2100153
Version: 3 - Revision

# CERTIFICATE OF ANALYSIS – REVISED REPORT

**MAXXAM JOB #: B5A6435**
**Received: 2015/11/30, 13:10**

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Amanda Hung, B.Sc., Project Manager
Email: AHung@maxxam.ca
Phone# (204)772-7276 Ext:2215

==========

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

Maxxam Job #: B5A6435
Report Date: 2015/12/18

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

## RESULTS OF CHEMICAL ANALYSES OF SOIL

| Maxxam ID | | NT0522 | | NT0523 | NT0524 | NT0525 | NT0526 | NT0528 | NT0529 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | | 2015/11/28 08:00 | | 2015/11/28 08:00 | 2015/11/28 08:00 | 2015/11/28 08:00 | 2015/11/28 12:00 | 2015/11/28 12:00 | 2015/11/28 12:00 | | |
| COC Number | | N001799 | | N001799 | N001799 | N001799 | N001799 | N001799 | N001799 | | |
| | UNITS | BH1-S3 | RDL | BH2-S1 | BH2-S2 | BH3-S1 | BH4-S2 | BH5-S3 | BH6-S5 | RDL | QC Batch |
| **Physical Properties** | | | | | | | | | | | |
| Soluble (2:1) pH | pH | | | 8.67 | | 8.51 | 8.93 | | | N/A | 8131497 |
| **Physical Properties** | | | | | | | | | | | |
| Moisture | % | 32 | 0.3 | | 22 | 23 | 26 | 32 | 34 | 0.3 | 8130223 |
| RDL = Reportable Detection Limit | | | | | | | | | | | |

| Maxxam ID | | NT0530 | | | NT2744 | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2015/11/28 12:00 | | | 2015/11/28 12:00 | |
| COC Number | | N001799 | | | N000893 | |
| | UNITS | BH7-S5 | RDL | QC Batch | BH5-S1 | QC Batch |
| **Physical Properties** | | | | | | |
| Soluble (2:1) pH | pH | | N/A | 8131497 | 8.67 | 8132771 |
| **Physical Properties** | | | | | | |
| Moisture | % | 38 | 0.3 | 8130223 | | |
| RDL = Reportable Detection Limit | | | | | | |



Maxxam Analytics International Corporation o/a Maxxam Analytics Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Maxxam Job #: B5A6435
Report Date: 2015/12/18

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

## PETROLEUM HYDROCARBONS (CCME)

| Maxxam ID | | NT0522 | NT0524 | NT0525 | NT0526 | NT0528 | NT0529 | | |
|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | | 2015/11/28 08:00 | 2015/11/28 08:00 | 2015/11/28 08:00 | 2015/11/28 12:00 | 2015/11/28 12:00 | 2015/11/28 12:00 | | |
| COC Number | | N001799 | N001799 | N001799 | N001799 | N001799 | N001799 | | |
| | UNITS | BH1-S3 | BH2-S2 | BH3-S1 | BH4-S2 | BH5-S3 | BH6-S5 | RDL | QC Batch |
| **Ext. Pet. Hydrocarbon** | | | | | | | | | |
| F2 (C10-C16 Hydrocarbons) | mg/kg | <20 | 1400 | 31 | 1500 | <20 | <20 | 20 | 8130771 |
| F3 (C16-C34 Hydrocarbons) | mg/kg | 27 | 430 | 260 | 380 | 25 | 30 | 20 | 8130771 |
| F4 (C34-C50 Hydrocarbons) | mg/kg | <20 | <20 | 240 | <20 | <20 | <20 | 20 | 8130771 |
| Reached Baseline at C50 | mg/kg | Yes | Yes | No | Yes | Yes | Yes | N/A | 8130771 |
| F4G-SG (Heavy Hydrocarbons-Grav.) | mg/kg | | | 1200 | | | | 500 | 8134166 |
| **Surrogate Recovery (%)** | | | | | | | | | |
| O-TERPHENYL (sur.) | % | 84 | 87 | 84 | 99 | 93 | 92 | | 8130771 |

RDL = Reportable Detection Limit
N/A = Not Applicable

| Maxxam ID | | NT0530 | | |
|---|---|---|---|---|
| Sampling Date | | 2015/11/28 12:00 | | |
| COC Number | | N001799 | | |
| | UNITS | BH7-S5 | RDL | QC Batch |
| **Ext. Pet. Hydrocarbon** | | | | |
| F2 (C10-C16 Hydrocarbons) | mg/kg | <20 | 20 | 8130771 |
| F3 (C16-C34 Hydrocarbons) | mg/kg | 26 | 20 | 8130771 |
| F4 (C34-C50 Hydrocarbons) | mg/kg | <20 | 20 | 8130771 |
| Reached Baseline at C50 | mg/kg | Yes | N/A | 8130771 |
| **Surrogate Recovery (%)** | | | | |
| O-TERPHENYL (sur.) | % | 97 | | 8130771 |

RDL = Reportable Detection Limit
N/A = Not Applicable



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Maxxam Job #: B5A6435
Report Date: 2015/12/18

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

## SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | NT0524 | | | NT0525 | | NT0526 | | |
|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | | 2015/11/28 08:00 | | | 2015/11/28 08:00 | | 2015/11/28 12:00 | | |
| COC Number | | N001799 | | | N001799 | | N001799 | | |
| | UNITS | BH2-S2 | RDL | QC Batch | BH3-S1 | RDL | BH4-S2 | RDL | QC Batch |
| **Calculated Parameters** | | | | | | | | | |
| Index of Additive Cancer Risk(IARC) | N/A | 0.31 | 0.10 | 8140949 | 27 | 0.10 | 0.31 | 0.10 | 8130397 |
| Benzo[a]pyrene equivalency | N/A | <0.10 | 0.10 | 8140949 | 2.2 | 0.10 | <0.10 | 0.10 | 8130397 |
| **Polycyclic Aromatics** | | | | | | | | | |
| Naphthalene | mg/kg | <0.026 (1) | 0.026 | 8147216 | 0.18 | 0.010 | 3.0 | 0.010 | 8132094 |
| 2-Methylnaphthalene | mg/kg | <0.023 (1) | 0.023 | 8147216 | 0.086 | 0.020 | 24 (2) | 0.10 | 8132094 |
| Acenaphthylene | mg/kg | <0.0050 | 0.0050 | 8147216 | 0.073 | 0.0050 | <0.048 (1) | 0.048 | 8132094 |
| Acenaphthene | mg/kg | <0.16 (1) | 0.16 | 8147216 | 0.30 | 0.0050 | 1.4 | 0.0050 | 8132094 |
| Fluorene | mg/kg | <0.19 (1) | 0.19 | 8147216 | 0.36 | 0.020 | 1.8 | 0.020 | 8132094 |
| Phenanthrene | mg/kg | 0.17 | 0.010 | 8147216 | 2.8 | 0.010 | 2.0 | 0.010 | 8132094 |
| Anthracene | mg/kg | <0.040 (1) | 0.040 | 8147216 | 0.71 | 0.0040 | 0.35 | 0.0040 | 8132094 |
| Fluoranthene | mg/kg | <0.020 | 0.020 | 8147216 | 3.8 | 0.020 | 0.045 | 0.020 | 8132094 |
| Pyrene | mg/kg | <0.020 | 0.020 | 8147216 | 3.3 | 0.020 | 0.025 | 0.020 | 8132094 |
| Benzo(a)anthracene | mg/kg | <0.020 | 0.020 | 8147216 | 1.6 | 0.020 | <0.020 | 0.020 | 8132094 |
| Chrysene | mg/kg | <0.020 | 0.020 | 8147216 | 1.6 | 0.020 | <0.020 | 0.020 | 8132094 |
| Benzo(b&j)fluoranthene | mg/kg | <0.020 | 0.020 | 8147216 | 1.9 | 0.020 | <0.020 | 0.020 | 8132094 |
| Benzo(b)fluoranthene | mg/kg | <0.020 | 0.020 | 8147216 | 1.2 | 0.020 | <0.020 | 0.020 | 8132094 |
| Benzo(k)fluoranthene | mg/kg | <0.020 | 0.020 | 8147216 | 0.65 | 0.020 | <0.020 | 0.020 | 8132094 |
| Benzo(a)pyrene | mg/kg | <0.020 | 0.020 | 8147216 | 1.4 | 0.020 | <0.020 | 0.020 | 8132094 |
| Indeno(1,2,3-cd)pyrene | mg/kg | <0.050 | 0.050 | 8147216 | 0.78 | 0.050 | <0.050 | 0.050 | 8132094 |
| Dibenz(a,h)anthracene | mg/kg | <0.050 | 0.050 | 8147216 | 0.22 | 0.050 | <0.050 | 0.050 | 8132094 |
| Benzo(g,h,i)perylene | mg/kg | <0.050 | 0.050 | 8147216 | 0.85 | 0.050 | <0.050 | 0.050 | 8132094 |
| Low Molecular Weight PAH`s | mg/kg | <0.19 | 0.19 | 8140950 | 4.6 | 0.050 | 32 | 0.10 | 8130350 |
| High Molecular Weight PAH`s | mg/kg | <0.050 | 0.050 | 8140950 | 16 | 0.050 | 0.071 | 0.050 | 8130350 |
| Total PAH | mg/kg | <0.19 | 0.19 | 8140950 | 21 | 0.050 | 32 | 0.10 | 8130350 |
| **Surrogate Recovery (%)** | | | | | | | | | |
| D10-ANTHRACENE (sur.) | % | 96 | | 8147216 | 88 | | 76 | | 8132094 |
| D8-ACENAPHTHYLENE (sur.) | % | 86 | | 8147216 | 86 | | 78 | | 8132094 |
| D8-NAPHTHALENE (sur.) | % | 75 | | 8147216 | 86 | | 82 | | 8132094 |
| TERPHENYL-D14 (sur.) | % | 106 | | 8147216 | 96 | | 87 | | 8132094 |

RDL = Reportable Detection Limit
(1) Detection limits raised due to matrix interference.
(2) Detection limits raised due to dilution to bring analyte within the calibrated range.



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Maxxam Job #: B5A6435
Report Date: 2015/12/18

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | NT0523 | NT0525 | NT0526 | | NT2744 | | |
|---|---|---|---|---|---|---|---|---|
| Sampling Date | | 2015/11/28 08:00 | 2015/11/28 08:00 | 2015/11/28 12:00 | | 2015/11/28 12:00 | | |
| COC Number | | N001799 | N001799 | N001799 | | N000893 | | |
| | UNITS | BH2-S1 | BH3-S1 | BH4-S2 | QC Batch | BH5-S1 | RDL | QC Batch |
| **Total Metals by ICPMS** | | | | | | | | |
| Total Aluminum (Al) | mg/kg | 28900 | 16400 | 29000 | 8131495 | 6570 | 100 | 8132768 |
| Total Antimony (Sb) | mg/kg | 0.31 | 2.51 | 0.42 | 8131495 | 0.20 | 0.10 | 8132768 |
| Total Arsenic (As) | mg/kg | 6.48 | 6.25 | 8.32 | 8131495 | 1.16 | 0.50 | 8132768 |
| Total Barium (Ba) | mg/kg | 170 | 192 | 250 | 8131495 | 47.7 | 0.10 | 8132768 |
| Total Beryllium (Be) | mg/kg | 1.01 | 0.67 | 1.24 | 8131495 | <0.40 | 0.40 | 8132768 |
| Total Bismuth (Bi) | mg/kg | 0.23 | 0.18 | 0.27 | 8131495 | <0.10 | 0.10 | 8132768 |
| Total Cadmium (Cd) | mg/kg | 0.640 | 0.635 | 0.665 | 8131495 | 0.229 | 0.050 | 8132768 |
| Total Calcium (Ca) | mg/kg | 38200 | 72100 | 37500 | 8131495 | 110000 | 100 | 8132768 |
| Total Chromium (Cr) | mg/kg | 50.9 | 30.2 | 50.7 | 8131495 | 14.0 | 1.0 | 8132768 |
| Total Cobalt (Co) | mg/kg | 14.2 | 7.74 | 15.5 | 8131495 | 3.28 | 0.30 | 8132768 |
| Total Copper (Cu) | mg/kg | 32.0 | 44.9 | 35.9 | 8131495 | 8.67 | 0.50 | 8132768 |
| Total Iron (Fe) | mg/kg | 30000 | 19900 | 30700 | 8131495 | 8930 | 100 | 8132768 |
| Total Lead (Pb) | mg/kg | 12.3 | 165 | 15.1 | 8131495 | 5.11 | 0.10 | 8132768 |
| Total Lithium (Li) | mg/kg | 42.5 | 17.3 | 43.0 | 8131495 | 11.3 | 5.0 | 8132768 |
| Total Magnesium (Mg) | mg/kg | 20900 | 30300 | 19900 | 8131495 | 55300 | 100 | 8132768 |
| Total Manganese (Mn) | mg/kg | 522 | 399 | 520 | 8131495 | 207 | 0.20 | 8132768 |
| Total Mercury (Hg) | mg/kg | <0.050 | 0.153 | <0.050 | 8131495 | <0.050 | 0.050 | 8132768 |
| Total Molybdenum (Mo) | mg/kg | 0.34 | 1.19 | 0.87 | 8131495 | 0.41 | 0.10 | 8132768 |
| Total Nickel (Ni) | mg/kg | 41.6 | 22.3 | 46.8 | 8131495 | 10.0 | 0.80 | 8132768 |
| Total Phosphorus (P) | mg/kg | 535 | 671 | 530 | 8131495 | 402 | 10 | 8132768 |
| Total Potassium (K) | mg/kg | 5170 | 3050 | 4780 | 8131495 | 1960 | 100 | 8132768 |
| Total Selenium (Se) | mg/kg | <0.50 | 0.54 | <0.50 | 8131495 | <0.50 | 0.50 | 8132768 |
| Total Silver (Ag) | mg/kg | 0.120 | 0.211 | 0.160 | 8131495 | 0.052 | 0.050 | 8132768 |
| Total Sodium (Na) | mg/kg | 498 | 476 | 688 | 8131495 | 327 | 100 | 8132768 |
| Total Strontium (Sr) | mg/kg | 91.6 | 103 | 104 | 8131495 | 54.3 | 0.10 | 8132768 |
| Total Thallium (Tl) | mg/kg | 0.352 | 0.196 | 0.361 | 8131495 | 0.107 | 0.050 | 8132768 |
| Total Tin (Sn) | mg/kg | 0.82 | 10.4 | 0.89 | 8131495 | 0.38 | 0.10 | 8132768 |
| Total Titanium (Ti) | mg/kg | 535 | 208 | 286 | 8131495 | 316 | 1.0 | 8132768 |
| Total Uranium (U) | mg/kg | 1.28 | 0.971 | 1.49 | 8131495 | 0.529 | 0.050 | 8132768 |
| Total Vanadium (V) | mg/kg | 86.4 | 46.2 | 84.6 | 8131495 | 23.6 | 2.0 | 8132768 |
| Total Zinc (Zn) | mg/kg | 92.2 | 126 | 94.2 | 8131495 | 21.2 | 1.0 | 8132768 |
| Total Zirconium (Zr) | mg/kg | 13.2 | 5.01 | 14.9 | 8131495 | 4.80 | 0.50 | 8132768 |
| RDL = Reportable Detection Limit | | | | | | | | |



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Maxxam Job #: B5A6435
Report Date: 2015/12/18

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

## VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | NT0522 | NT0524 | | NT0525 | | NT0526 | | |
|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | | 2015/11/28 08:00 | 2015/11/28 08:00 | | 2015/11/28 08:00 | | 2015/11/28 12:00 | | |
| COC Number | | N001799 | N001799 | | N001799 | | N001799 | | |
| | UNITS | BH1-S3 | BH2-S2 | RDL | BH3-S1 | RDL | BH4-S2 | RDL | QC Batch |
| **Volatiles** | | | | | | | | | |
| Benzene | mg/kg | <0.0050 | <0.0050 | 0.0050 | 0.026 | 0.0050 | <0.0050 | 0.0050 | 8130219 |
| Toluene | mg/kg | <0.020 | <0.020 | 0.020 | <0.030 (1) | 0.030 | <0.020 | 0.020 | 8130219 |
| Ethylbenzene | mg/kg | <0.010 | <0.010 | 0.010 | <0.010 | 0.010 | <0.010 | 0.010 | 8130219 |
| Xylenes (Total) | mg/kg | <0.040 | <0.040 | 0.040 | <0.040 | 0.040 | <0.040 | 0.040 | 8130219 |
| m & p-Xylene | mg/kg | <0.040 | <0.040 | 0.040 | <0.040 | 0.040 | <0.040 | 0.040 | 8130219 |
| o-Xylene | mg/kg | <0.020 | <0.020 | 0.020 | <0.020 | 0.020 | <0.028 (2) | 0.028 | 8130219 |
| Methyl-tert-butylether (MTBE) | mg/kg | <0.10 | <0.10 | 0.10 | <0.10 | 0.10 | <0.10 | 0.10 | 8130219 |
| F1 (C6-C10) - BTEX | mg/kg | <10 | 95 | 10 | <10 | 10 | 190 | 10 | 8130219 |
| F1 (C6-C10) | mg/kg | <10 | 95 | 10 | <10 | 10 | 190 | 10 | 8130219 |
| **Surrogate Recovery (%)** | | | | | | | | | |
| 4-Bromofluorobenzene (sur.) | % | 100 | 99 | | 100 | | 100 | | 8130219 |
| D10-ETHYLBENZENE (sur.) | % | 125 | 114 | | 115 | | 116 | | 8130219 |
| D4-1,2-Dichloroethane (sur.) | % | 98 | 95 | | 96 | | 100 | | 8130219 |
| D8-TOLUENE (sur.) | % | 101 | 100 | | 99 | | 98 | | 8130219 |

RDL = Reportable Detection Limit
(1) RDL raised due to background artifacts detected in analysis
(2) Detection limits raised due to matrix interference.



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Report Date: 2015/12/18

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

## VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | NT0528 | NT0529 | NT0530 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2015/11/28 12:00 | 2015/11/28 12:00 | 2015/11/28 12:00 | | |
| COC Number | | N001799 | N001799 | N001799 | | |
| | UNITS | BH5-S3 | BH6-S5 | BH7-S5 | RDL | QC Batch |
| **Volatiles** | | | | | | |
| Benzene | mg/kg | <0.0050 | <0.0050 | <0.0050 | 0.0050 | 8130219 |
| Toluene | mg/kg | <0.020 | <0.020 | <0.020 | 0.020 | 8130219 |
| Ethylbenzene | mg/kg | <0.010 | <0.010 | <0.010 | 0.010 | 8130219 |
| Xylenes (Total) | mg/kg | <0.040 | <0.040 | <0.040 | 0.040 | 8130219 |
| m & p-Xylene | mg/kg | <0.040 | <0.040 | <0.040 | 0.040 | 8130219 |
| o-Xylene | mg/kg | <0.020 | <0.020 | <0.020 | 0.020 | 8130219 |
| Methyl-tert-butylether (MTBE) | mg/kg | <0.10 | <0.10 | <0.10 | 0.10 | 8130219 |
| F1 (C6-C10) - BTEX | mg/kg | <10 | <10 | <10 | 10 | 8130219 |
| F1 (C6-C10) | mg/kg | <10 | <10 | <10 | 10 | 8130219 |
| **Surrogate Recovery (%)** | | | | | | |
| 4-Bromofluorobenzene (sur.) | % | 100 | 100 | 100 | | 8130219 |
| D10-ETHYLBENZENE (sur.) | % | 119 | 126 | 119 | | 8130219 |
| D4-1,2-Dichloroethane (sur.) | % | 93 | 97 | 99 | | 8130219 |
| D8-TOLUENE (sur.) | % | 101 | 101 | 100 | | 8130219 |
| RDL = Reportable Detection Limit | | | | | | |



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PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

## VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | NT0522 | NT0524 | NT0525 | | NT0526 | | NT0528 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | | 2015/11/28 08:00 | 2015/11/28 08:00 | 2015/11/28 08:00 | | 2015/11/28 12:00 | | 2015/11/28 12:00 | | |
| COC Number | | N001799 | N001799 | N001799 | | N001799 | | N001799 | | |
| | UNITS | BH1-S3 | BH2-S2 | BH3-S1 | RDL | BH4-S2 | RDL | BH5-S3 | RDL | QC Batch |
| **Volatiles** | | | | | | | | | | |
| Chloromethane | mg/kg | <0.10 | <0.10 | <0.10 | 0.10 | <0.10 | 0.10 | <0.10 | 0.10 | 8131717 |
| Vinyl chloride | mg/kg | <0.060 | <0.060 | <0.060 | 0.060 | <0.060 | 0.060 | <0.060 | 0.060 | 8131717 |
| Bromomethane | mg/kg | <0.30 | <0.30 | <0.30 | 0.30 | <0.30 | 0.30 | <0.30 | 0.30 | 8131717 |
| Chloroethane | mg/kg | <0.10 | <0.10 | <0.10 | 0.10 | <0.10 | 0.10 | <0.10 | 0.10 | 8131717 |
| Trichlorofluoromethane | mg/kg | <0.20 | <0.20 | <0.20 | 0.20 | <0.20 | 0.20 | <0.20 | 0.20 | 8131717 |
| 1,1-dichloroethene | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| Dichloromethane | mg/kg | <0.10 | <0.10 | <0.10 | 0.10 | <0.10 | 0.10 | <0.10 | 0.10 | 8131717 |
| trans-1,2-dichloroethene | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| 1,1-dichloroethane | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| cis-1,2-dichloroethene | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| Chloroform | mg/kg | <0.050 | <0.050 | <0.050 | 0.050 | <0.050 | 0.050 | <0.050 | 0.050 | 8131717 |
| 1,1,1-trichloroethane | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| 1,2-dichloroethane | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| Carbon tetrachloride | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| 1,2-dichloropropane | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| Trichloroethene | mg/kg | <0.0090 | <0.0090 | <0.0090 | 0.0090 | <0.0090 | 0.0090 | <0.0090 | 0.0090 | 8131717 |
| Bromodichloromethane | mg/kg | <0.050 | <0.050 | <0.050 | 0.050 | <0.21 (1) | 0.21 | <0.050 | 0.050 | 8131717 |
| cis-1,3-dichloropropene | mg/kg | <0.050 | <0.050 | <0.050 | 0.050 | <0.050 | 0.050 | <0.050 | 0.050 | 8131717 |
| trans-1,3-dichloropropene | mg/kg | <0.050 | <0.050 | <0.050 | 0.050 | <0.050 | 0.050 | <0.050 | 0.050 | 8131717 |
| 1,1,2-trichloroethane | mg/kg | <0.025 | 0.037 | <0.025 | 0.025 | <0.22 (1) | 0.22 | <0.025 | 0.025 | 8131717 |
| Chlorodibromomethane | mg/kg | <0.050 | <0.050 | <0.050 | 0.050 | <0.050 | 0.050 | <0.050 | 0.050 | 8131717 |
| 1,2-dibromoethane | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| Tetrachloroethene | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| Chlorobenzene | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| 1,1,1,2-tetrachloroethane | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| Bromoform | mg/kg | <0.050 | <0.050 | <0.050 | 0.050 | <0.050 | 0.050 | <0.050 | 0.050 | 8131717 |
| Styrene | mg/kg | <0.030 | <0.030 | <0.030 | 0.030 | <0.030 | 0.030 | <0.030 | 0.030 | 8131717 |
| 1,1,2,2-tetrachloroethane | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| 1,2-dichlorobenzene | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| 1,3-dichlorobenzene | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| 1,4-dichlorobenzene | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |
| 1,2,3-trichlorobenzene | mg/kg | <0.025 | 0.19 | <0.025 | 0.025 | <0.64 (1) | 0.64 | <0.025 | 0.025 | 8131717 |
| Hexachlorobutadiene | mg/kg | <0.20 | <0.20 | <0.20 | 0.20 | <0.20 | 0.20 | <0.20 | 0.20 | 8131717 |
| 1,2,4-trichlorobenzene | mg/kg | <0.025 | <0.025 | <0.025 | 0.025 | <0.025 | 0.025 | <0.025 | 0.025 | 8131717 |

RDL = Reportable Detection Limit
(1) Detection limits raised due to matrix interference.



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PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

## VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | NT0522 | NT0524 | NT0525 | | NT0526 | | NT0528 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | | 2015/11/28 08:00 | 2015/11/28 08:00 | 2015/11/28 08:00 | | 2015/11/28 12:00 | | 2015/11/28 12:00 | | |
| COC Number | | N001799 | N001799 | N001799 | | N001799 | | N001799 | | |
| | UNITS | BH1-S3 | BH2-S2 | BH3-S1 | RDL | BH4-S2 | RDL | BH5-S3 | RDL | QC Batch |
| **Surrogate Recovery (%)** | | | | | | | | | | |
| 1,4-Difluorobenzene (sur.) | % | 102 | 101 | 104 | | 102 | | 102 | | 8131717 |
| 4-Bromofluorobenzene (sur.) | % | 102 | 112 | 117 | | 100 | | 118 | | 8131717 |
| D10-ETHYLBENZENE (sur.) | % | 128 | 129 | 130 | | 124 | | 129 | | 8131717 |
| D4-1,2-Dichloroethane (sur.) | % | 111 | 110 | 110 | | 111 | | 111 | | 8131717 |
| RDL = Reportable Detection Limit | | | | | | | | | | |



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## VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | NT0529 | NT0530 | | |
|---|---|---|---|---|---|
| Sampling Date | | 2015/11/28 12:00 | 2015/11/28 12:00 | | |
| COC Number | | N001799 | N001799 | | |
| | UNITS | BH6-S5 | BH7-S5 | RDL | QC Batch |
| **Volatiles** | | | | | |
| Chloromethane | mg/kg | <0.10 | <0.10 | 0.10 | 8131717 |
| Vinyl chloride | mg/kg | <0.060 | <0.060 | 0.060 | 8131717 |
| Bromomethane | mg/kg | <0.30 | <0.30 | 0.30 | 8131717 |
| Chloroethane | mg/kg | <0.10 | <0.10 | 0.10 | 8131717 |
| Trichlorofluoromethane | mg/kg | <0.20 | <0.20 | 0.20 | 8131717 |
| 1,1-dichloroethene | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| Dichloromethane | mg/kg | <0.10 | <0.10 | 0.10 | 8131717 |
| trans-1,2-dichloroethene | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| 1,1-dichloroethane | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| cis-1,2-dichloroethene | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| Chloroform | mg/kg | <0.050 | <0.050 | 0.050 | 8131717 |
| 1,1,1-trichloroethane | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| 1,2-dichloroethane | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| Carbon tetrachloride | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| 1,2-dichloropropane | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| Trichloroethene | mg/kg | <0.0090 | <0.0090 | 0.0090 | 8131717 |
| Bromodichloromethane | mg/kg | <0.050 | <0.050 | 0.050 | 8131717 |
| cis-1,3-dichloropropene | mg/kg | <0.050 | <0.050 | 0.050 | 8131717 |
| trans-1,3-dichloropropene | mg/kg | <0.050 | <0.050 | 0.050 | 8131717 |
| 1,1,2-trichloroethane | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| Chlorodibromomethane | mg/kg | <0.050 | <0.050 | 0.050 | 8131717 |
| 1,2-dibromoethane | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| Tetrachloroethene | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| Chlorobenzene | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| 1,1,1,2-tetrachloroethane | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| Bromoform | mg/kg | <0.050 | <0.050 | 0.050 | 8131717 |
| Styrene | mg/kg | <0.030 | <0.030 | 0.030 | 8131717 |
| 1,1,2,2-tetrachloroethane | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| 1,2-dichlorobenzene | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| 1,3-dichlorobenzene | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| 1,4-dichlorobenzene | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| 1,2,3-trichlorobenzene | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| Hexachlorobutadiene | mg/kg | <0.20 | <0.20 | 0.20 | 8131717 |
| 1,2,4-trichlorobenzene | mg/kg | <0.025 | <0.025 | 0.025 | 8131717 |
| **Surrogate Recovery (%)** | | | | | |
| 1,4-Difluorobenzene (sur.) | % | 99 | 99 | | 8131717 |
| RDL = Reportable Detection Limit | | | | | |



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Maxxam Job #: B5A6435
Report Date: 2015/12/18

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

## VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | NT0529 | NT0530 | | |
|---|---|---|---|---|---|
| Sampling Date | | 2015/11/28 12:00 | 2015/11/28 12:00 | | |
| COC Number | | N001799 | N001799 | | |
| | UNITS | BH6-S5 | BH7-S5 | RDL | QC Batch |
| 4-Bromofluorobenzene (sur.) | % | 105 | 102 | | 8131717 |
| D10-ETHYLBENZENE (sur.) | % | 127 | 129 | | 8131717 |
| D4-1,2-Dichloroethane (sur.) | % | 109 | 109 | | 8131717 |
| RDL = Reportable Detection Limit | | | | | |



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Maxxam Job #: B5A6435
Report Date: 2015/12/18

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

## GENERAL COMMENTS

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



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Maxxam Job #: B5A6435
Report Date: 2015/12/18

## QUALITY ASSURANCE REPORT

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| 8130219 | 4-Bromofluorobenzene (sur.) | 2015/12/01 | 104 | 60 - 140 | 99 | 60 - 140 | 99 | % | | | | |
| 8130219 | D10-ETHYLBENZENE (sur.) | 2015/12/01 | 114 | 50 - 130 | 113 | 50 - 130 | 115 | % | | | | |
| 8130219 | D4-1,2-Dichloroethane (sur.) | 2015/12/01 | 92 | 60 - 140 | 95 | 60 - 140 | 99 | % | | | | |
| 8130219 | D8-TOLUENE (sur.) | 2015/12/01 | 99 | 60 - 140 | 100 | 60 - 140 | 100 | % | | | | |
| 8130771 | O-TERPHENYL (sur.) | 2015/12/01 | 89 | 50 - 130 | 90 | 50 - 130 | 93 | % | | | | |
| 8131717 | 1,4-Difluorobenzene (sur.) | 2015/12/02 | 101 | 70 - 130 | 100 | 70 - 130 | 101 | % | | | | |
| 8131717 | 4-Bromofluorobenzene (sur.) | 2015/12/02 | 102 | 70 - 130 | 111 | 70 - 130 | 100 | % | | | | |
| 8131717 | D10-ETHYLBENZENE (sur.) | 2015/12/02 | 130 | 50 - 130 | 107 | 50 - 130 | 109 | % | | | | |
| 8131717 | D4-1,2-Dichloroethane (sur.) | 2015/12/02 | | | 117 | 70 - 130 | 101 | % | | | | |
| 8132094 | D10-ANTHRACENE (sur.) | 2015/12/02 | 86 | 60 - 130 | 90 | 60 - 130 | 100 | % | | | | |
| 8132094 | D8-ACENAPHTHYLENE (sur.) | 2015/12/02 | 87 | 50 - 130 | 87 | 50 - 130 | 97 | % | | | | |
| 8132094 | D8-NAPHTHALENE (sur.) | 2015/12/02 | 92 | 50 - 130 | 87 | 50 - 130 | 95 | % | | | | |
| 8132094 | TERPHENYL-D14 (sur.) | 2015/12/02 | 94 | 60 - 130 | 95 | 60 - 130 | 104 | % | | | | |
| 8147216 | D10-ANTHRACENE (sur.) | 2015/12/17 | 84 | 60 - 130 | 85 | 60 - 130 | 98 | % | | | | |
| 8147216 | D8-ACENAPHTHYLENE (sur.) | 2015/12/17 | 82 | 50 - 130 | 85 | 50 - 130 | 88 | % | | | | |
| 8147216 | D8-NAPHTHALENE (sur.) | 2015/12/17 | 72 | 50 - 130 | 87 | 50 - 130 | 92 | % | | | | |
| 8147216 | TERPHENYL-D14 (sur.) | 2015/12/17 | 88 | 60 - 130 | 92 | 60 - 130 | 103 | % | | | | |
| 8130219 | Benzene | 2015/12/01 | 107 | 60 - 140 | 111 | 60 - 140 | <0.0050 | mg/kg | NC | 50 | | |
| 8130219 | Ethylbenzene | 2015/12/01 | 117 | 60 - 140 | 117 | 60 - 140 | <0.010 | mg/kg | NC | 50 | | |
| 8130219 | F1 (C6-C10) - BTEX | 2015/12/01 | | | | | <10 | mg/kg | NC | 50 | | |
| 8130219 | F1 (C6-C10) | 2015/12/01 | 124 | 60 - 140 | 79 | 60 - 140 | <10 | mg/kg | NC | 50 | | |
| 8130219 | m & p-Xylene | 2015/12/01 | 121 | 60 - 140 | 121 | 60 - 140 | <0.040 | mg/kg | NC | 50 | | |
| 8130219 | Methyl-tert-butylether (MTBE) | 2015/12/01 | 106 | 60 - 140 | 110 | 60 - 140 | <0.10 | mg/kg | NC | 50 | | |
| 8130219 | o-Xylene | 2015/12/01 | 116 | 60 - 140 | 116 | 60 - 140 | <0.020 | mg/kg | NC | 50 | | |
| 8130219 | Toluene | 2015/12/01 | 112 | 60 - 140 | 114 | 60 - 140 | <0.020 | mg/kg | NC | 50 | | |
| 8130219 | Xylenes (Total) | 2015/12/01 | | | | | <0.040 | mg/kg | NC | 50 | | |
| 8130223 | Moisture | 2015/12/02 | | | | | <0.3 | % | 5.2 | 20 | | |
| 8130771 | F2 (C10-C16 Hydrocarbons) | 2015/12/01 | NC | 50 - 130 | 90 | 70 - 130 | <20 | mg/kg | NC | 50 | | |
| 8130771 | F3 (C16-C34 Hydrocarbons) | 2015/12/01 | 79 | 50 - 130 | 84 | 70 - 130 | <20 | mg/kg | NC | 50 | | |
| 8130771 | F4 (C34-C50 Hydrocarbons) | 2015/12/01 | 87 | 50 - 130 | 78 | 70 - 130 | <20 | mg/kg | NC | 50 | | |
| 8130771 | Reached Baseline at C50 | 2015/12/01 | | | | | YES | mg/kg | NC | 50 | | |
| 8131495 | Total Aluminum (Al) | 2015/12/02 | | | | | <100 | mg/kg | 4.8 | 35 | 117 | 70 - 130 |



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| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| 8131495 | Total Antimony (Sb) | 2015/12/02 | 89 | 75 - 125 | 95 | 75 - 125 | <0.10 | mg/kg | 5.9 | 30 | 94 | 70 - 130 |
| 8131495 | Total Arsenic (As) | 2015/12/02 | 89 | 75 - 125 | 95 | 75 - 125 | 0.80, RDL=0.50 | mg/kg | 0.36 | 30 | 89 | 70 - 130 |
| 8131495 | Total Barium (Ba) | 2015/12/02 | NC | 75 - 125 | 89 | 75 - 125 | <0.10 | mg/kg | 1.1 | 35 | 101 | 70 - 130 |
| 8131495 | Total Beryllium (Be) | 2015/12/02 | 92 | 75 - 125 | 94 | 75 - 125 | <0.40 | mg/kg | NC | 30 | | |
| 8131495 | Total Bismuth (Bi) | 2015/12/02 | | | | | <0.10 | mg/kg | NC | 30 | | |
| 8131495 | Total Cadmium (Cd) | 2015/12/02 | 97 | 75 - 125 | 97 | 75 - 125 | <0.050 | mg/kg | 0.94 | 30 | 108 | 70 - 130 |
| 8131495 | Total Calcium (Ca) | 2015/12/02 | | | | | <100 | mg/kg | 1.3 | 30 | 98 | 70 - 130 |
| 8131495 | Total Chromium (Cr) | 2015/12/02 | NC | 75 - 125 | 97 | 75 - 125 | <1.0 | mg/kg | 2.8 | 30 | 110 | 70 - 130 |
| 8131495 | Total Cobalt (Co) | 2015/12/02 | 89 | 75 - 125 | 99 | 75 - 125 | <0.30 | mg/kg | 1.7 | 30 | 96 | 70 - 130 |
| 8131495 | Total Copper (Cu) | 2015/12/02 | NC | 75 - 125 | 96 | 75 - 125 | <0.50 | mg/kg | 1.4 | 30 | 88 | 70 - 130 |
| 8131495 | Total Iron (Fe) | 2015/12/02 | | | | | <100 | mg/kg | 1.7 | 30 | 98 | 70 - 130 |
| 8131495 | Total Lead (Pb) | 2015/12/02 | 93 | 75 - 125 | 93 | 75 - 125 | <0.10 | mg/kg | 1.3 | 35 | 97 | 70 - 130 |
| 8131495 | Total Lithium (Li) | 2015/12/02 | 89 | 75 - 125 | 96 | 75 - 125 | <5.0 | mg/kg | NC | 30 | | |
| 8131495 | Total Magnesium (Mg) | 2015/12/02 | | | | | <100 | mg/kg | 4.4 | 30 | 104 | 70 - 130 |
| 8131495 | Total Manganese (Mn) | 2015/12/02 | NC | 75 - 125 | 100 | 75 - 125 | <0.20 | mg/kg | 1.0 | 30 | 105 | 70 - 130 |
| 8131495 | Total Mercury (Hg) | 2015/12/02 | 102 | 75 - 125 | 104 | 75 - 125 | <0.050 | mg/kg | NC | 35 | 93 | 70 - 130 |
| 8131495 | Total Molybdenum (Mo) | 2015/12/02 | 98 | 75 - 125 | 94 | 75 - 125 | <0.10 | mg/kg | 5.6 | 35 | 118 | 70 - 130 |
| 8131495 | Total Nickel (Ni) | 2015/12/02 | NC | 75 - 125 | 95 | 75 - 125 | <0.80 | mg/kg | 2.6 | 30 | 94 | 70 - 130 |
| 8131495 | Total Phosphorus (P) | 2015/12/02 | | | | | <10 | mg/kg | 3.9 | 30 | 95 | 70 - 130 |
| 8131495 | Total Potassium (K) | 2015/12/02 | | | | | <100 | mg/kg | 1.8 | 35 | | |
| 8131495 | Total Selenium (Se) | 2015/12/02 | 96 | 75 - 125 | 102 | 75 - 125 | <0.50 | mg/kg | NC | 30 | | |
| 8131495 | Total Silver (Ag) | 2015/12/02 | 67 (1) | 75 - 125 | 71 (3) | 75 - 125 | <0.050 | mg/kg | NC | 35 | 85 | 60 - 140 |
| 8131495 | Total Sodium (Na) | 2015/12/02 | | | | | <100 | mg/kg | NC | 35 | | |
| 8131495 | Total Strontium (Sr) | 2015/12/02 | NC | 75 - 125 | 92 | 75 - 125 | <0.10 | mg/kg | 1.4 | 35 | 101 | 70 - 130 |
| 8131495 | Total Thallium (Tl) | 2015/12/02 | 102 | 75 - 125 | 97 | 75 - 125 | <0.050 | mg/kg | NC | 30 | 97 | 70 - 130 |
| 8131495 | Total Tin (Sn) | 2015/12/02 | 90 | 75 - 125 | 83 | 75 - 125 | <0.10 | mg/kg | NC | 35 | | |
| 8131495 | Total Titanium (Ti) | 2015/12/02 | NC | 75 - 125 | 94 | 75 - 125 | <1.0 | mg/kg | 3.3 | 35 | 113 | 70 - 130 |
| 8131495 | Total Uranium (U) | 2015/12/02 | 93 | 75 - 125 | 85 | 75 - 125 | <0.050 | mg/kg | 2.5 | 30 | 137 (2) | 70 - 130 |
| 8131495 | Total Vanadium (V) | 2015/12/02 | NC | 75 - 125 | 100 | 75 - 125 | <2.0 | mg/kg | 1.8 | 30 | 114 | 70 - 130 |
| 8131495 | Total Zinc (Zn) | 2015/12/02 | NC | 75 - 125 | 106 | 75 - 125 | <1.0 | mg/kg | 3.2 | 30 | 93 | 70 - 130 |
| 8131495 | Total Zirconium (Zr) | 2015/12/02 | | | | | <0.50 | mg/kg | 2.7 | 30 | | |



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| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| 8131497 | Soluble (2:1) pH | 2015/12/02 | | | 100 | 97 - 103 | | | 1.1 | N/A | | |
| 8131717 | 1,1,1,2-tetrachloroethane | 2015/12/02 | 121 | 60 - 140 | 103 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,1,1-trichloroethane | 2015/12/02 | 129 | 60 - 140 | 103 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,1,2,2-tetrachloroethane | 2015/12/02 | 112 | 60 - 140 | 104 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,1,2-trichloroethane | 2015/12/02 | 127 | 60 - 140 | 106 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,1-dichloroethane | 2015/12/02 | 123 | 60 - 140 | 98 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,1-dichloroethene | 2015/12/02 | 124 | 60 - 140 | 97 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,2,3-trichlorobenzene | 2015/12/02 | 137 | 60 - 140 | 118 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,2,4-trichlorobenzene | 2015/12/02 | 139 | 60 - 140 | 120 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,2-dibromoethane | 2015/12/02 | 133 | 60 - 140 | 108 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,2-dichlorobenzene | 2015/12/02 | 100 | 60 - 140 | 105 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,2-dichloroethane | 2015/12/02 | 129 | 60 - 140 | 102 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,2-dichloropropane | 2015/12/02 | 131 | 60 - 140 | 105 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,3-dichlorobenzene | 2015/12/02 | 98 | 60 - 140 | 101 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | 1,4-dichlorobenzene | 2015/12/02 | 98 | 60 - 140 | 100 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | Bromodichloromethane | 2015/12/02 | 124 | 60 - 140 | 102 | 60 - 140 | <0.050 | mg/kg | NC | 40 | | |
| 8131717 | Bromoform | 2015/12/02 | 123 | 60 - 140 | 100 | 60 - 140 | <0.050 | mg/kg | NC | 40 | | |
| 8131717 | Bromomethane | 2015/12/02 | 129 | 50 - 150 | 104 | 50 - 150 | <0.30 | mg/kg | NC | 40 | | |
| 8131717 | Carbon tetrachloride | 2015/12/02 | 129 | 60 - 140 | 101 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | Chlorobenzene | 2015/12/02 | 131 | 60 - 140 | 109 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | Chlorodibromomethane | 2015/12/02 | 129 | 60 - 140 | 104 | 60 - 140 | <0.050 | mg/kg | NC | 40 | | |
| 8131717 | Chloroethane | 2015/12/02 | 119 | 50 - 150 | 97 | 50 - 150 | <0.10 | mg/kg | NC | 40 | | |
| 8131717 | Chloroform | 2015/12/02 | 131 | 60 - 140 | 101 | 60 - 140 | <0.050 | mg/kg | NC | 40 | | |
| 8131717 | Chloromethane | 2015/12/02 | 131 | 50 - 150 | 103 | 50 - 150 | <0.10 | mg/kg | NC | 40 | | |
| 8131717 | cis-1,2-dichloroethene | 2015/12/02 | 137 | 60 - 140 | 107 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | cis-1,3-dichloropropene | 2015/12/02 | 140 | 60 - 140 | 121 | 60 - 140 | <0.050 | mg/kg | NC | 40 | | |
| 8131717 | Dichloromethane | 2015/12/02 | 140 | 60 - 140 | 113 | 60 - 140 | <0.10 | mg/kg | NC | 40 | | |
| 8131717 | Hexachlorobutadiene | 2015/12/02 | 100 | 50 - 150 | 99 | 50 - 150 | <0.20 | mg/kg | NC | 40 | | |
| 8131717 | Styrene | 2015/12/02 | 139 | 60 - 140 | 122 | 60 - 140 | <0.030 | mg/kg | NC | 40 | | |
| 8131717 | Tetrachloroethene | 2015/12/02 | 126 | 60 - 140 | 102 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | trans-1,2-dichloroethene | 2015/12/02 | 117 | 60 - 140 | 91 | 60 - 140 | <0.025 | mg/kg | NC | 40 | | |
| 8131717 | trans-1,3-dichloropropene | 2015/12/02 | 138 | 60 - 140 | 118 | 60 - 140 | <0.050 | mg/kg | NC | 40 | | |



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## QUALITY ASSURANCE REPORT(CONT'D)



| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| 8131717 | Trichloroethene | 2015/12/02 | 131 | 60 - 140 | 102 | 60 - 140 | <0.0090 | mg/kg | NC | 40 | | |
| 8131717 | Trichlorofluoromethane | 2015/12/02 | 90 | 50 - 150 | 125 | 50 - 150 | <0.20 | mg/kg | NC | 40 | | |
| 8131717 | Vinyl chloride | 2015/12/02 | 129 | 50 - 150 | 102 | 50 - 150 | <0.060 | mg/kg | NC | 40 | | |
| 8132094 | 2-Methylnaphthalene | 2015/12/02 | 85 | 50 - 130 | 88 | 50 - 130 | <0.020 | mg/kg | NC | 50 | | |
| 8132094 | Acenaphthene | 2015/12/02 | 87 | 50 - 130 | 88 | 50 - 130 | <0.0050 | mg/kg | NC | 50 | | |
| 8132094 | Acenaphthylene | 2015/12/02 | 82 | 50 - 130 | 86 | 50 - 130 | <0.0050 | mg/kg | NC | 50 | | |
| 8132094 | Anthracene | 2015/12/02 | 83 | 60 - 130 | 88 | 60 - 130 | <0.0040 | mg/kg | NC | 50 | | |
| 8132094 | Benzo(a)anthracene | 2015/12/02 | 76 | 60 - 130 | 82 | 60 - 130 | <0.020 | mg/kg | NC | 50 | | |
| 8132094 | Benzo(a)pyrene | 2015/12/02 | 73 | 60 - 130 | 81 | 60 - 130 | <0.020 | mg/kg | NC | 50 | | |
| 8132094 | Benzo(b&j)fluoranthene | 2015/12/02 | 79 | 60 - 130 | 86 | 60 - 130 | <0.020 | mg/kg | NC | 50 | | |
| 8132094 | Benzo(b)fluoranthene | 2015/12/02 | 79 | 60 - 130 | 86 | 60 - 130 | <0.020 | mg/kg | NC | 20 | | |
| 8132094 | Benzo(g,h,i)perylene | 2015/12/02 | 76 | 60 - 130 | 81 | 60 - 130 | <0.050 | mg/kg | NC | 50 | | |
| 8132094 | Benzo(k)fluoranthene | 2015/12/02 | 75 | 60 - 130 | 82 | 60 - 130 | <0.020 | mg/kg | NC | 50 | | |
| 8132094 | Chrysene | 2015/12/02 | 81 | 60 - 130 | 87 | 60 - 130 | <0.020 | mg/kg | NC | 50 | | |
| 8132094 | Dibenz(a,h)anthracene | 2015/12/02 | 77 | 60 - 130 | 79 | 60 - 130 | <0.050 | mg/kg | NC | 50 | | |
| 8132094 | Fluoranthene | 2015/12/02 | 80 | 60 - 130 | 88 | 60 - 130 | <0.020 | mg/kg | NC | 50 | | |
| 8132094 | Fluorene | 2015/12/02 | 83 | 50 - 130 | 85 | 50 - 130 | <0.020 | mg/kg | NC | 50 | | |
| 8132094 | Indeno(1,2,3-cd)pyrene | 2015/12/02 | 76 | 60 - 130 | 80 | 60 - 130 | <0.050 | mg/kg | NC | 50 | | |
| 8132094 | Naphthalene | 2015/12/02 | 84 | 50 - 130 | 86 | 50 - 130 | <0.010 | mg/kg | NC | 50 | | |
| 8132094 | Phenanthrene | 2015/12/02 | 83 | 60 - 130 | 88 | 60 - 130 | <0.010 | mg/kg | NC | 50 | | |
| 8132094 | Pyrene | 2015/12/02 | 82 | 60 - 130 | 90 | 60 - 130 | <0.020 | mg/kg | NC | 50 | | |
| 8132768 | Total Aluminum (Al) | 2015/12/03 | | | | | <100 | mg/kg | | | 102 | 70 - 130 |
| 8132768 | Total Antimony (Sb) | 2015/12/03 | 92 | 75 - 125 | 101 | 75 - 125 | <0.10 | mg/kg | | | 93 | 70 - 130 |
| 8132768 | Total Arsenic (As) | 2015/12/03 | 95 | 75 - 125 | 99 | 75 - 125 | <0.50 | mg/kg | | | 92 | 70 - 130 |
| 8132768 | Total Barium (Ba) | 2015/12/03 | NC | 75 - 125 | 98 | 75 - 125 | <0.10 | mg/kg | | | 99 | 70 - 130 |
| 8132768 | Total Beryllium (Be) | 2015/12/03 | 98 | 75 - 125 | 101 | 75 - 125 | <0.40 | mg/kg | | | | |
| 8132768 | Total Bismuth (Bi) | 2015/12/03 | | | | | <0.10 | mg/kg | | | | |
| 8132768 | Total Cadmium (Cd) | 2015/12/03 | 101 | 75 - 125 | 103 | 75 - 125 | <0.050 | mg/kg | 6.3 | 30 | 103 | 70 - 130 |
| 8132768 | Total Calcium (Ca) | 2015/12/03 | | | | | <100 | mg/kg | | | 93 | 70 - 130 |
| 8132768 | Total Chromium (Cr) | 2015/12/03 | 101 | 75 - 125 | 97 | 75 - 125 | <1.0 | mg/kg | | | 105 | 70 - 130 |
| 8132768 | Total Cobalt (Co) | 2015/12/03 | 98 | 75 - 125 | 100 | 75 - 125 | <0.30 | mg/kg | | | 92 | 70 - 130 |
| 8132768 | Total Copper (Cu) | 2015/12/03 | 99 | 75 - 125 | 103 | 75 - 125 | <0.50 | mg/kg | | | 89 | 70 - 130 |



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| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| 8132768 | Total Iron (Fe) | 2015/12/03 | | | | | <100 | mg/kg | | | 93 | 70 - 130 |
| 8132768 | Total Lead (Pb) | 2015/12/03 | 97 | 75 - 125 | 99 | 75 - 125 | <0.10 | mg/kg | | | 97 | 70 - 130 |
| 8132768 | Total Lithium (Li) | 2015/12/03 | 97 | 75 - 125 | 100 | 75 - 125 | <5.0 | mg/kg | | | | |
| 8132768 | Total Magnesium (Mg) | 2015/12/03 | | | | | <100 | mg/kg | | | 91 | 70 - 130 |
| 8132768 | Total Manganese (Mn) | 2015/12/03 | NC | 75 - 125 | 98 | 75 - 125 | 0.22, RDL=0.20 | mg/kg | | | 97 | 70 - 130 |
| 8132768 | Total Mercury (Hg) | 2015/12/03 | 106 | 75 - 125 | 111 | 75 - 125 | <0.050 | mg/kg | | | 122 | 70 - 130 |
| 8132768 | Total Molybdenum (Mo) | 2015/12/03 | 99 | 75 - 125 | 101 | 75 - 125 | <0.10 | mg/kg | | | 106 | 70 - 130 |
| 8132768 | Total Nickel (Ni) | 2015/12/03 | 101 | 75 - 125 | 103 | 75 - 125 | <0.80 | mg/kg | | | 91 | 70 - 130 |
| 8132768 | Total Phosphorus (P) | 2015/12/03 | | | | | <10 | mg/kg | | | 91 | 70 - 130 |
| 8132768 | Total Potassium (K) | 2015/12/03 | | | | | <100 | mg/kg | | | | |
| 8132768 | Total Selenium (Se) | 2015/12/03 | 101 | 75 - 125 | 106 | 75 - 125 | <0.50 | mg/kg | | | | |
| 8132768 | Total Silver (Ag) | 2015/12/03 | 99 | 75 - 125 | 96 | 75 - 125 | <0.050 | mg/kg | | | 92 | 60 - 140 |
| 8132768 | Total Sodium (Na) | 2015/12/03 | | | | | <100 | mg/kg | | | | |
| 8132768 | Total Strontium (Sr) | 2015/12/03 | 101 | 75 - 125 | 98 | 75 - 125 | <0.10 | mg/kg | | | 96 | 70 - 130 |
| 8132768 | Total Thallium (Tl) | 2015/12/03 | 100 | 75 - 125 | 101 | 75 - 125 | <0.050 | mg/kg | | | 97 | 70 - 130 |
| 8132768 | Total Tin (Sn) | 2015/12/03 | 94 | 75 - 125 | 93 | 75 - 125 | <0.10 | mg/kg | | | | |
| 8132768 | Total Titanium (Ti) | 2015/12/03 | 81 | 75 - 125 | 95 | 75 - 125 | <1.0 | mg/kg | | | 110 | 70 - 130 |
| 8132768 | Total Uranium (U) | 2015/12/03 | 97 | 75 - 125 | 98 | 75 - 125 | <0.050 | mg/kg | | | 127 | 70 - 130 |
| 8132768 | Total Vanadium (V) | 2015/12/03 | NC | 75 - 125 | 99 | 75 - 125 | <2.0 | mg/kg | | | 105 | 70 - 130 |
| 8132768 | Total Zinc (Zn) | 2015/12/03 | NC | 75 - 125 | 109 | 75 - 125 | <1.0 | mg/kg | | | 89 | 70 - 130 |
| 8132768 | Total Zirconium (Zr) | 2015/12/03 | | | | | <0.50 | mg/kg | | | | |
| 8132771 | Soluble (2:1) pH | 2015/12/03 | | | 6.1 (1) | 97 - 103 | | | 0.36 | N/A | | |
| 8134166 | F4G-SG (Heavy Hydrocarbons-Grav.) | 2015/12/04 | | | 119 | 70 - 130 | <500 | mg/kg | | | | |
| 8147216 | 2-Methylnaphthalene | 2015/12/17 | 76 | 50 - 130 | 83 | 50 - 130 | <0.020 | mg/kg | | | | |
| 8147216 | Acenaphthene | 2015/12/17 | 80 | 50 - 130 | 85 | 50 - 130 | <0.0050 | mg/kg | | | | |
| 8147216 | Acenaphthylene | 2015/12/17 | 79 | 50 - 130 | 82 | 50 - 130 | <0.0050 | mg/kg | | | | |
| 8147216 | Anthracene | 2015/12/17 | 82 | 60 - 130 | 88 | 60 - 130 | <0.0040 | mg/kg | | | | |
| 8147216 | Benzo(a)anthracene | 2015/12/17 | 65 | 60 - 130 | 81 | 60 - 130 | <0.020 | mg/kg | | | | |
| 8147216 | Benzo(a)pyrene | 2015/12/17 | 71 | 60 - 130 | 83 | 60 - 130 | <0.020 | mg/kg | | | | |
| 8147216 | Benzo(b&j)fluoranthene | 2015/12/17 | NC | 60 - 130 | 73 | 60 - 130 | <0.020 | mg/kg | | | | |
| 8147216 | Benzo(b)fluoranthene | 2015/12/17 | NC | 60 - 130 | 73 | 60 - 130 | <0.020 | mg/kg | | | | |



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## QUALITY ASSURANCE REPORT(CONT'D)



| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| 8147216 | Benzo(g,h,i)perylene | 2015/12/17 | 69 | 60 - 130 | 77 | 60 - 130 | <0.050 | mg/kg | | | | |
| 8147216 | Benzo(k)fluoranthene | 2015/12/17 | 70 | 60 - 130 | 101 | 60 - 130 | <0.020 | mg/kg | | | | |
| 8147216 | Chrysene | 2015/12/17 | NC | 60 - 130 | 87 | 60 - 130 | <0.020 | mg/kg | | | | |
| 8147216 | Dibenz(a,h)anthracene | 2015/12/17 | 75 | 60 - 130 | 78 | 60 - 130 | <0.050 | mg/kg | | | | |
| 8147216 | Fluoranthene | 2015/12/17 | NC | 60 - 130 | 85 | 60 - 130 | <0.020 | mg/kg | | | | |
| 8147216 | Fluorene | 2015/12/17 | 75 | 50 - 130 | 82 | 50 - 130 | <0.020 | mg/kg | | | | |
| 8147216 | Indeno(1,2,3-cd)pyrene | 2015/12/17 | 80 | 60 - 130 | 86 | 60 - 130 | <0.050 | mg/kg | | | | |
| 8147216 | Naphthalene | 2015/12/17 | 74 | 50 - 130 | 77 | 50 - 130 | <0.010 | mg/kg | | | | |
| 8147216 | Phenanthrene | 2015/12/17 | 74 | 60 - 130 | 83 | 60 - 130 | <0.010 | mg/kg | | | | |
| 8147216 | Pyrene | 2015/12/17 | NC | 60 - 130 | 85 | 60 - 130 | <0.020 | mg/kg | | | | |

N/A = Not Applicable

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

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

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

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

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(2) Reference Material exceeds acceptance criteria for Uranium. 10% of analytes failure in multielement scan is allowed.

(3) Spike exceeds acceptance criteria for Ag. 10% of analytes failure in multielement scan is allowed.



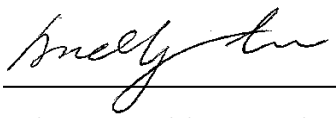
Maxxam Analytics International Corporation o/a Maxxam Analytics Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Maxxam Job #: B5A6435
Report Date: 2015/12/18

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.001

## VALIDATION SIGNATURE PAGE

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



Andy Lu, Data Validation Coordinator

Rob Reinert, Data Validation Coordinator

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



Maxxam Analytics International Corporation o/a Maxxam Analytics Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

# CHAIN OF CUSTODY RECORD

Maxxam
Unit D, 675 Berry St., Winnipeg, MB R3H 1A7
Phone: 204-772-7276 Fax: 204-772-2386 Toll Free: (866) 800-6208

Page 1 of 1

**INVOICE INFORMATION**
Company Name: PINCHIN
Contact Name: SEAN MULVEY
Address: 54 TERRACON PL
WINNIPEG
Phone: 792 6583 Fax:
Email: smulvey@pinchin.com

**REPORT INFORMATION (if different from invoice)**
Company Name:
Contact Name:
Address:
Phone: Fax:
Email:

**PROJECT INFORMATION**
Quotation #:
P.O. #:
Project #: 110069.001
Project Name:
Location:
Sampled By:

**MAXXAM JOB NUMBER**
B5A6435

**CHAIN OF CUSTODY #**
N001799

**REGULATORY REQUIREMENTS SERVICE REQUESTED:**
[X] CCME
[ ] DRINKING WATER
[ ] Other:

**Special Instructions:**

**SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM.**

**ANALYSIS REQUESTED (Please be specific)**

**TURNAROUND TIME (TAT) REQUIRED**

**PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS.**

Regular (Standard) TAT:
[ ] 5 to 7 Working Days

Rush TAT:
[ ] 1 day [ ] 2 days [X] 3 days

DATE Required:
TIME Required:

*TATs for certain tests are > 5 days. Please contact your Project Manager for details*

| | Lab Use | Sample Identification | Date Sampled | Time Sampled | Matrix (GW, SW, Soil etc) | Drinking Water? (Y / N) | Coliforms: Total / Fecal / E. coli / MF / MPN / QT | Field Filtered? N / Y | Field Acidified? N / Y | Field Acidified? N / Y | Dissolved Metals | Total Metal | BTEX | BTEX / F1 | F2 - F4 | PCB | Biochemical Oxygen Demand | VOCs | PAHs | METALS | HOLD - DO NOT ANALYZE | # of Cont. | COMMENTS / TAT COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | NT0522 | BH1 - S3 | 28/11/2015 | Am | SOIL | | | | | | | | | X | X | | | X | | | | | 2 | |
| 2 | NT0523 | BH2 - S1 | | | | | | | | | | | | | | | | | | X | | | bag |
| 3 | NT0524 | BH2 - S2 | | | | | | | | | | | | X | X | | | X | | | | | 2 | |
| 4 | NT0525 | BH3 - S1 | | | | | | | | | | | | X | X | | | X | X | X | | | 2 | + bag |
| 5 | NT0526 | BH4 - S2 | | Pm | | | | | | | | | | X | X | | | X | X | X | | | 2 | + bag |
| 6 | NT0527 | BH5 - S1 | | | | | | | | | | | | | | | | | | X | | | bag |
| 7 | NT0528 | BH5 - S3 | | | | | | | | | | | | X | X | | | X | | | | | 2 | |
| 8 | NT0529 | BH6 - S5 | | | | | | | | | | | | X | X | | | X | | | | | 2 | |
| 9 | NT0530 | BH7 - S5 | | | | | | | | | | | | X | X | | | X | | | | | 2 | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | |

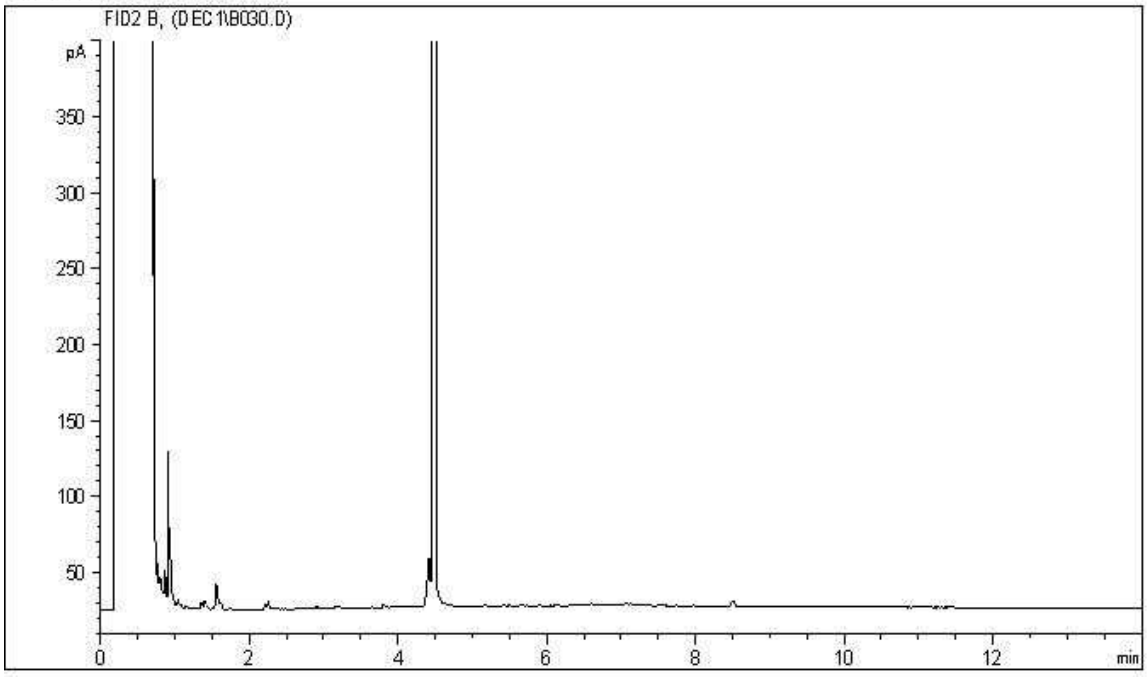
| RELINQUISHED BY (Signature/Print) | RECEIVED BY (Signature/Print) | Date | Time | #JARS USED AND NOT SUBMITTED | Laboratory Use Only |
|---|---|---|---|---|---|
| SEAN MULVEY | | 15/11/30 | 13:10 | | Temperature (°C) on Receipt: 3.2, 1.2, 5.8 ice present |

*MANDATORY SECTIONS IN GREY MUST BE FILLED OUT. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

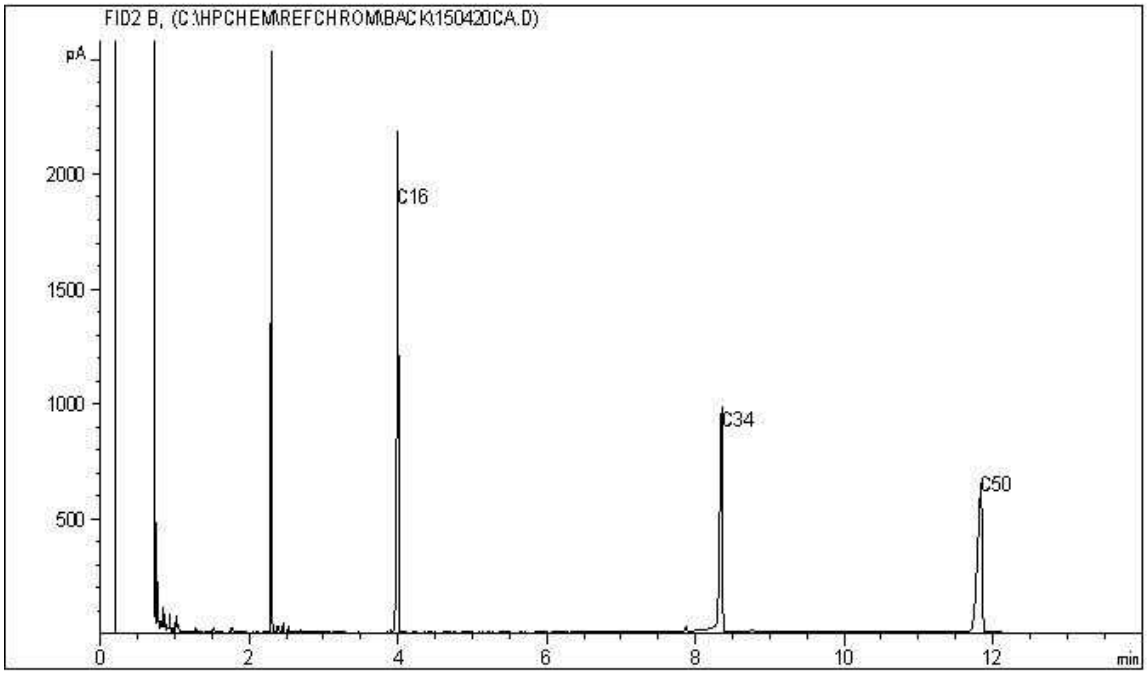
CoC-1028 - WINFCD-00161/1 Maxxam International Corporation o/a Maxxam White: Maxxam Yellow: Client Copy

**CCME Hydrocarbons (F2-F4 in soil) Chromatogram**

Instrument: WGC1




Carbon Range Distribution - Reference Chromatogram



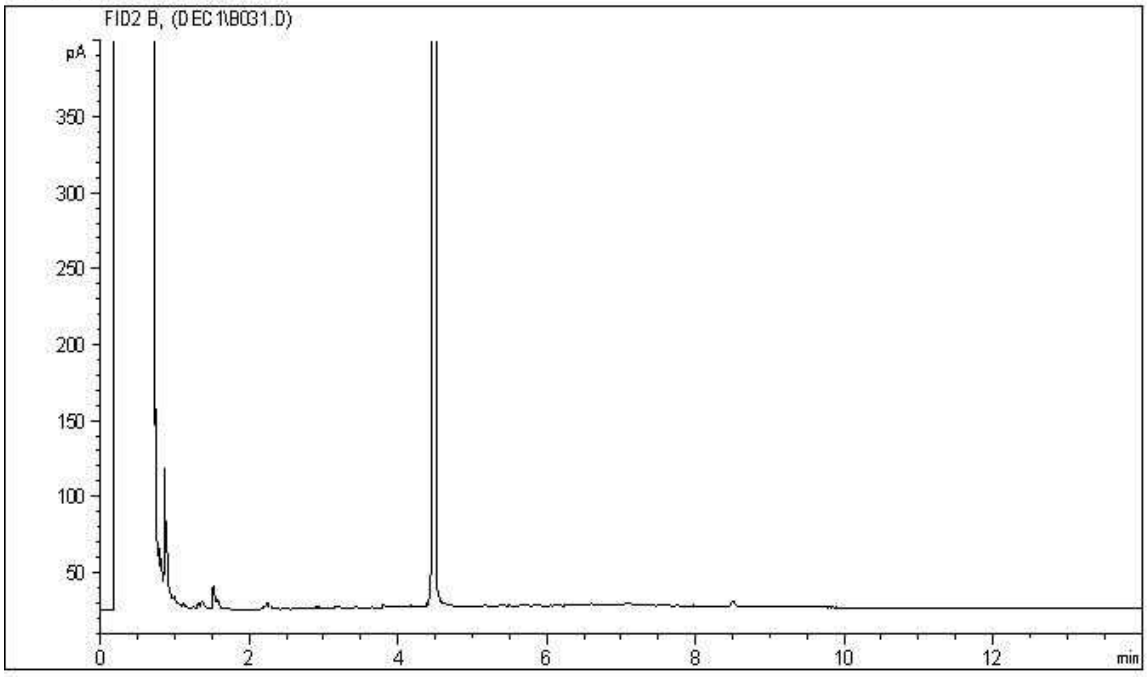

TYPICAL PRODUCT CARBON NUMBER RANGES

| | | | |
|---|---|---|---|
| Gasoline: | C4 - C12 | Diesel: | C8 - C22 |
| Varsol: | C8 - C12 | Lubricating Oils: | C20 - C40 |

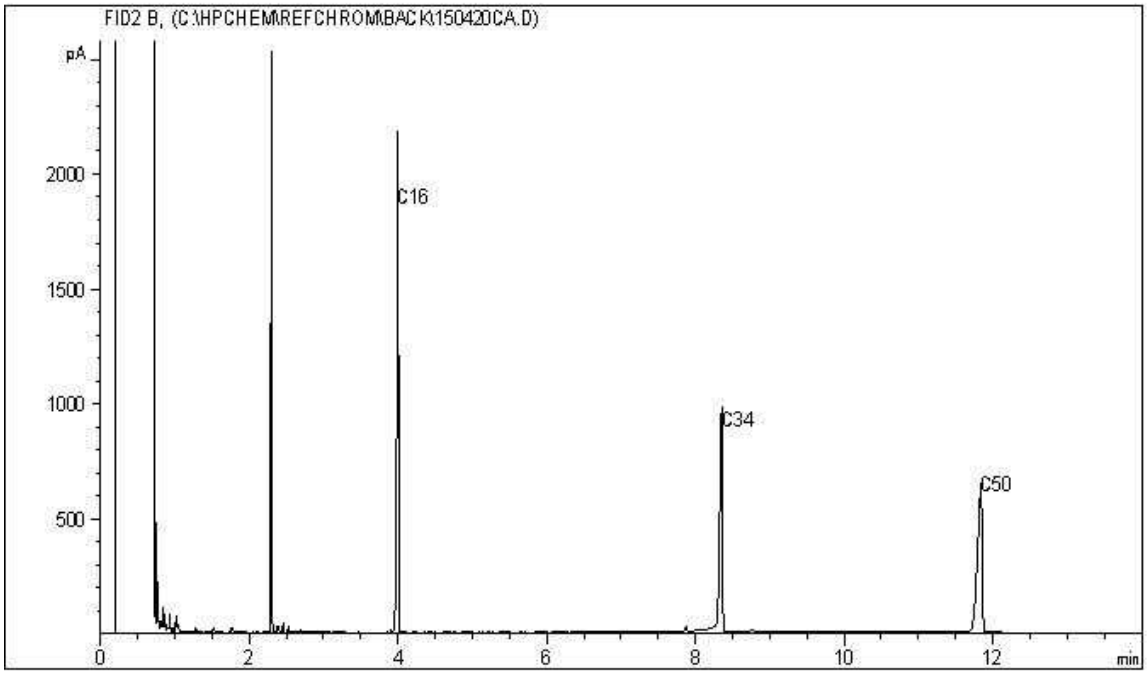
**Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.**

**CCME Hydrocarbons (F2-F4 in soil) Chromatogram**

Instrument: WGC1




Carbon Range Distribution - Reference Chromatogram




TYPICAL PRODUCT CARBON NUMBER RANGES

| | | | |
|---|---|---|---|
| Gasoline: | C4 - C12 | Diesel: | C8 - C22 |
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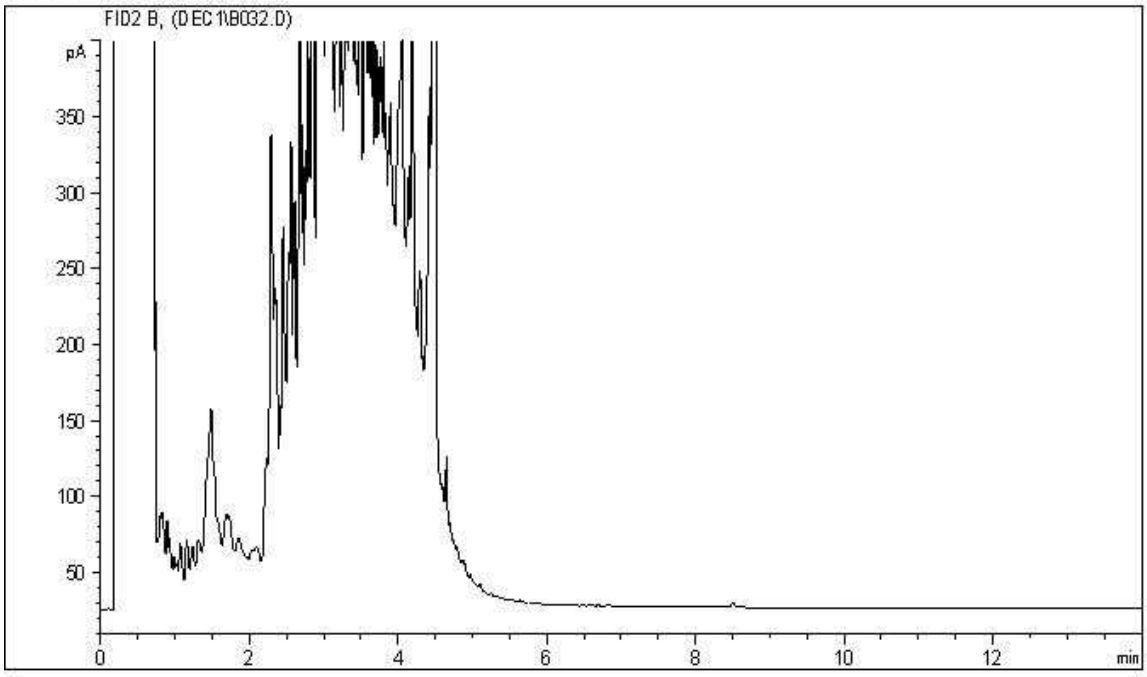
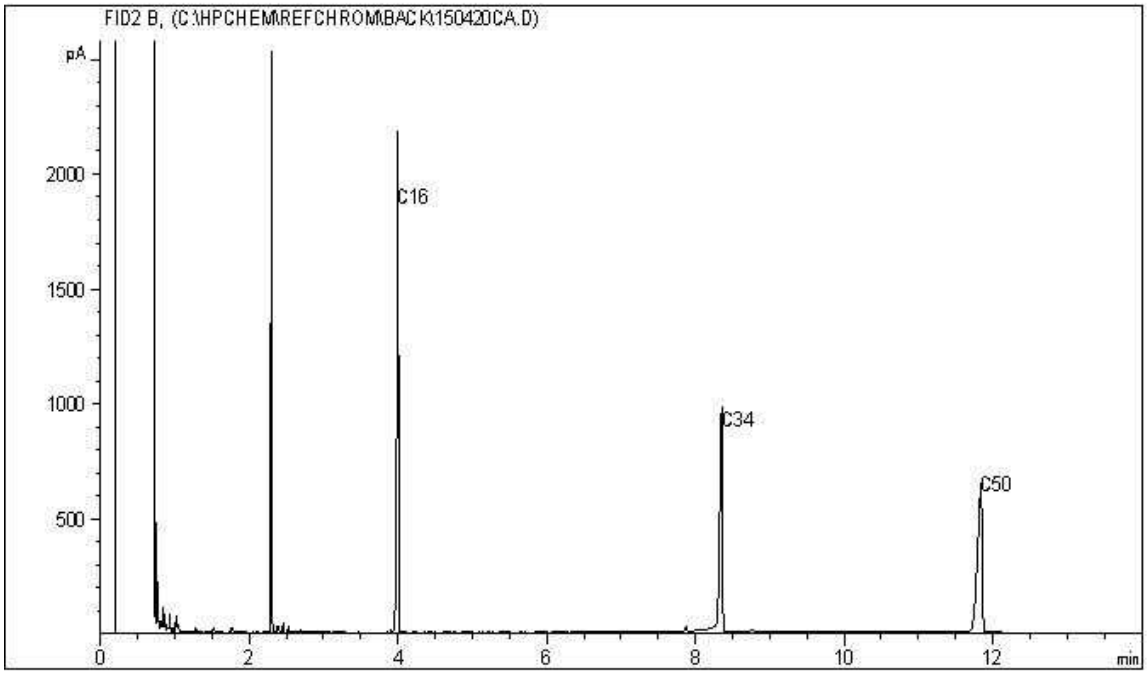
**CCME Hydrocarbons (F2-F4 in soil) Chromatogram**

Instrument: WGC1




Carbon Range Distribution - Reference Chromatogram




TYPICAL PRODUCT CARBON NUMBER RANGES

| | | | |
|---|---|---|---|
| Gasoline: | C4 - C12 | Diesel: | C8 - C22 |
| Varsol: | C8 - C12 | Lubricating Oils: | C20 - C40 |

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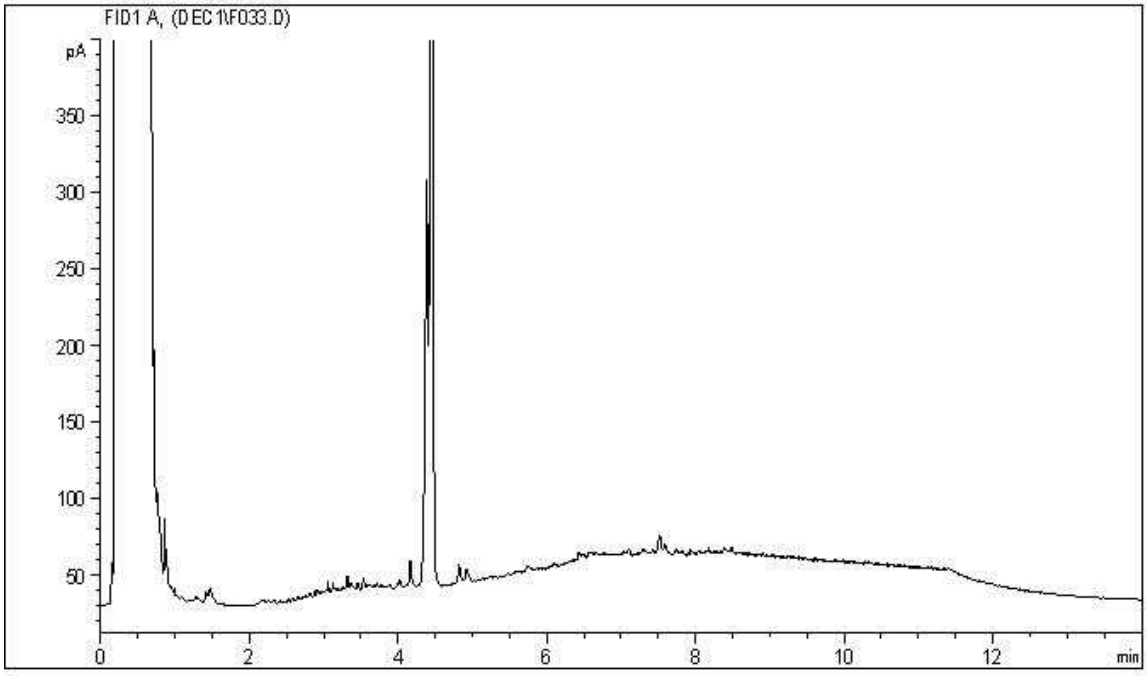
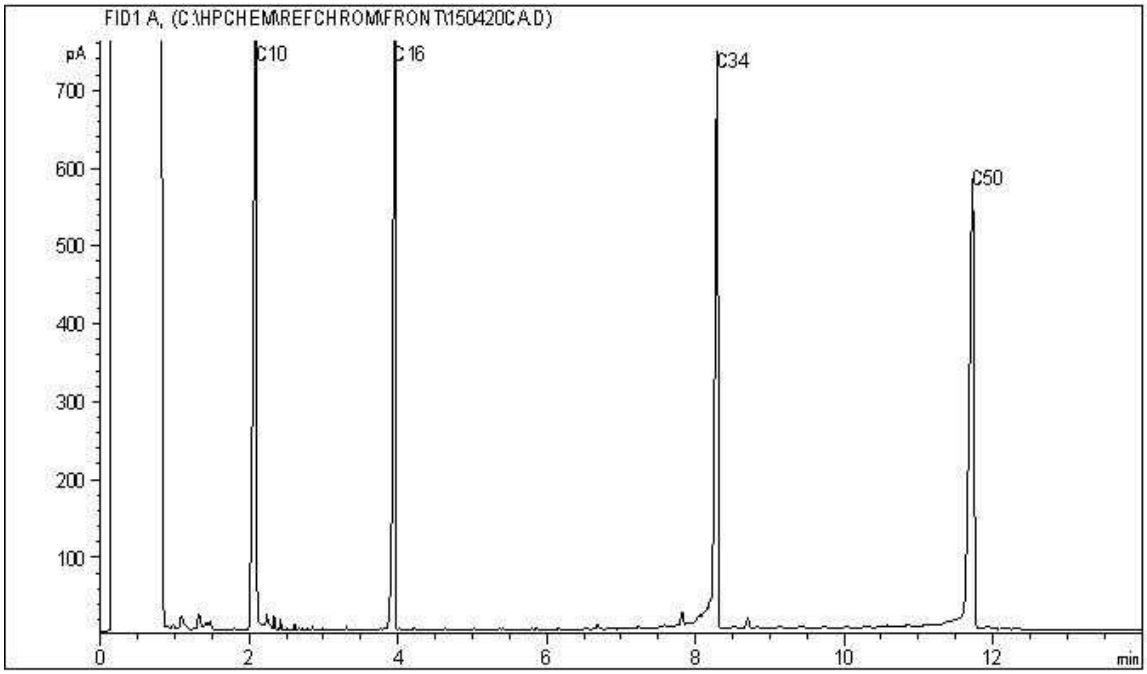
**CCME Hydrocarbons (F2-F4 in soil) Chromatogram**

Instrument: WGC1




Carbon Range Distribution - Reference Chromatogram




TYPICAL PRODUCT CARBON NUMBER RANGES

| | | | |
|---|---|---|---|
| Gasoline: | C4 - C12 | Diesel: | C8 - C22 |
| Varsol: | C8 - C12 | Lubricating Oils: | C20 - C40 |

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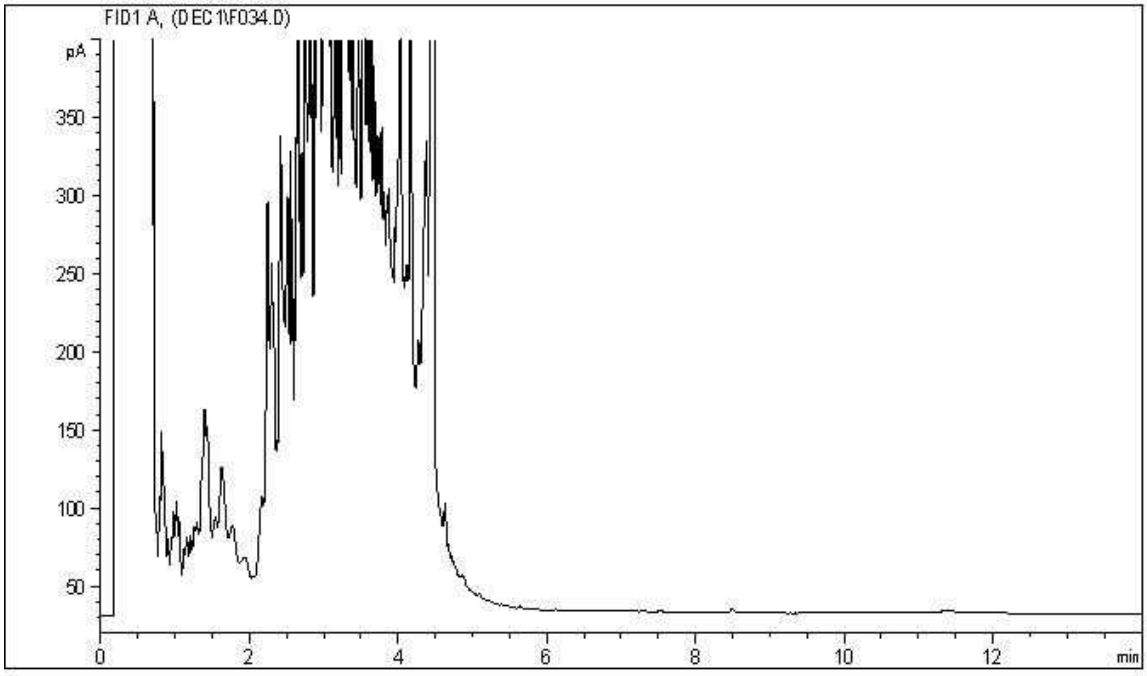
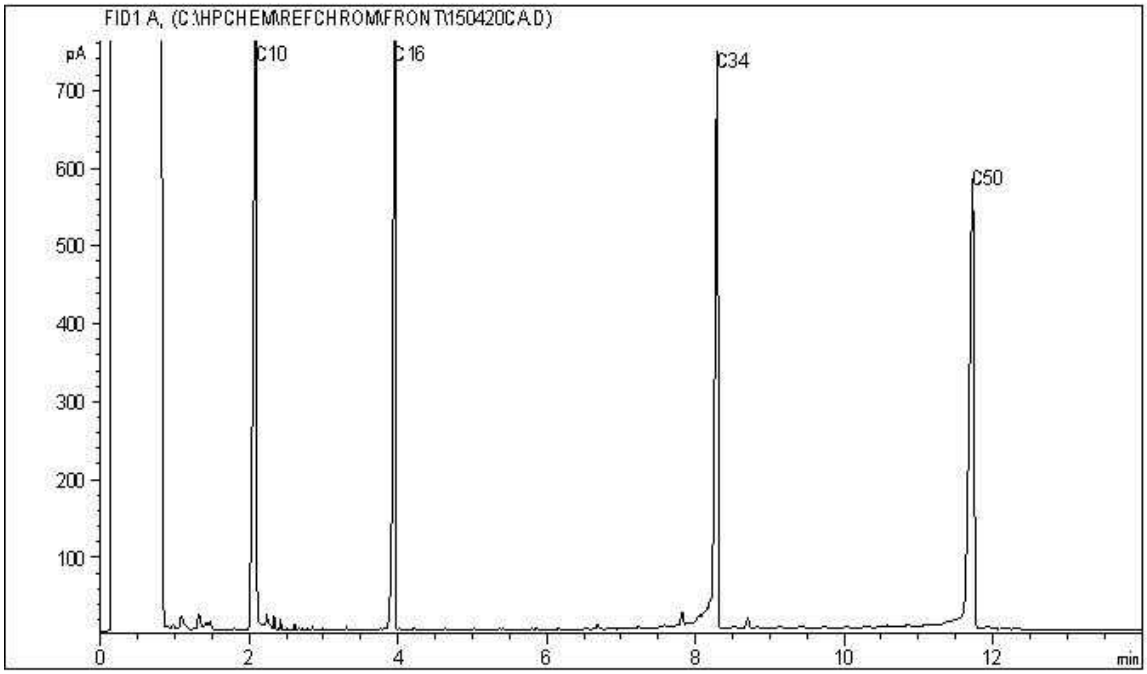
**CCME Hydrocarbons (F2-F4 in soil) Chromatogram**

Instrument: WGC1




Carbon Range Distribution - Reference Chromatogram




TYPICAL PRODUCT CARBON NUMBER RANGES

| | | | |
|---|---|---|---|
| Gasoline: | C4 - C12 | Diesel: | C8 - C22 |
| Varsol: | C8 - C12 | Lubricating Oils: | C20 - C40 |

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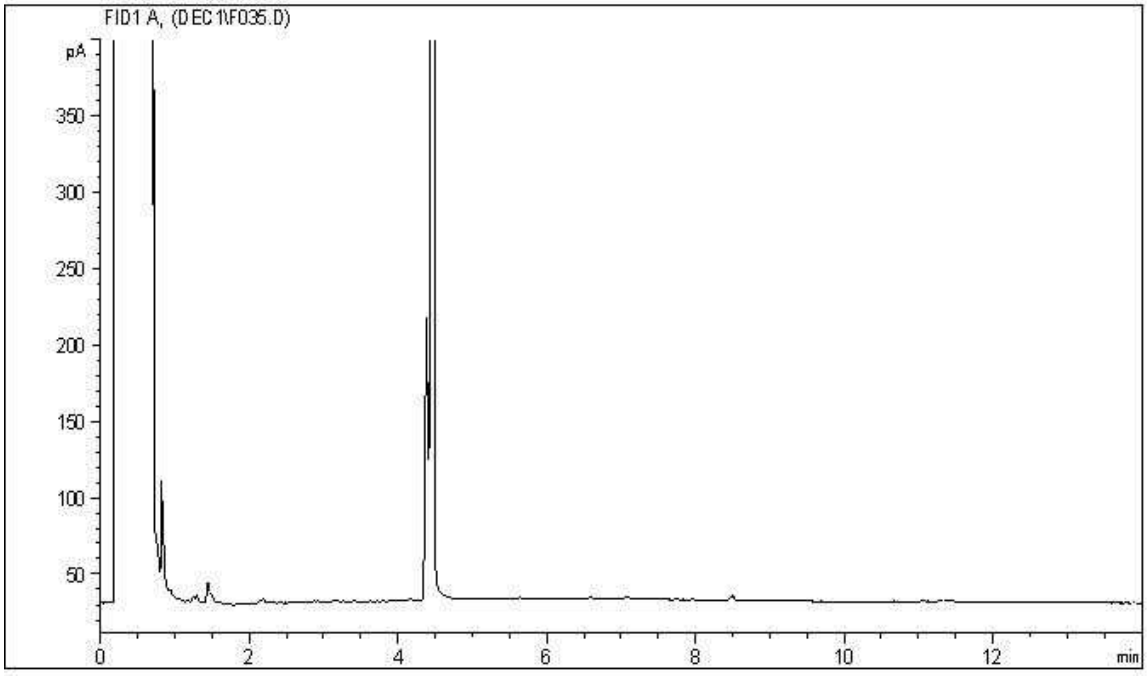
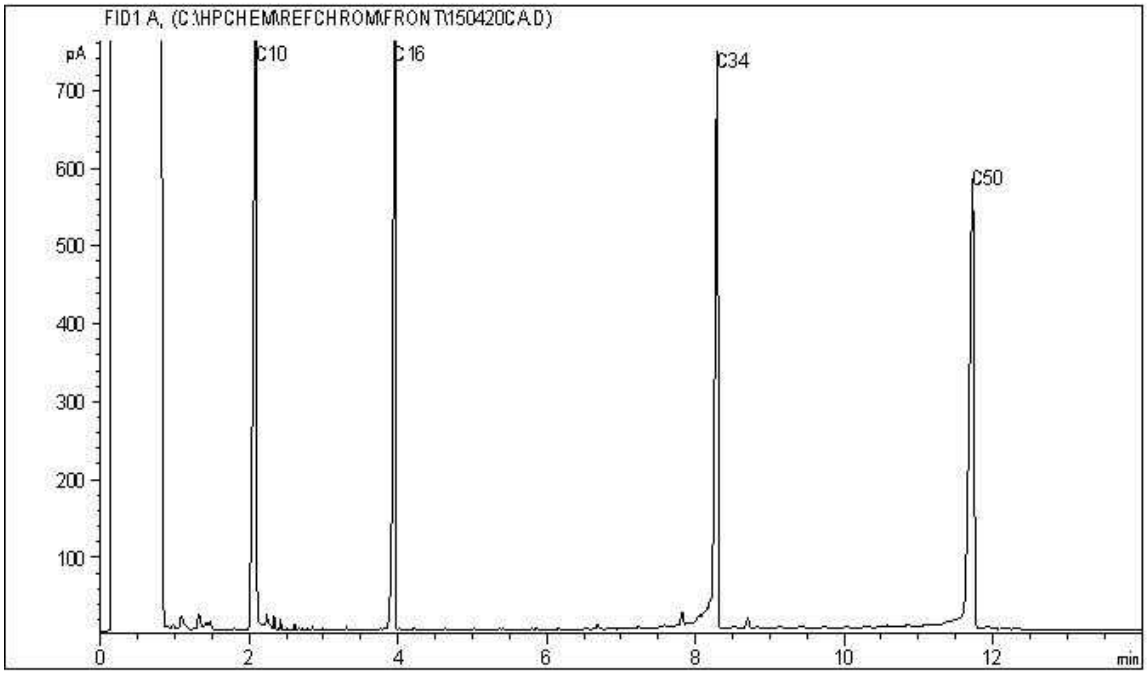
**CCME Hydrocarbons (F2-F4 in soil) Chromatogram**

Instrument: WGC1




Carbon Range Distribution - Reference Chromatogram




TYPICAL PRODUCT CARBON NUMBER RANGES

| | | | |
|---|---|---|---|
| Gasoline: | C4 - C12 | Diesel: | C8 - C22 |
| Varsol: | C8 - C12 | Lubricating Oils: | C20 - C40 |

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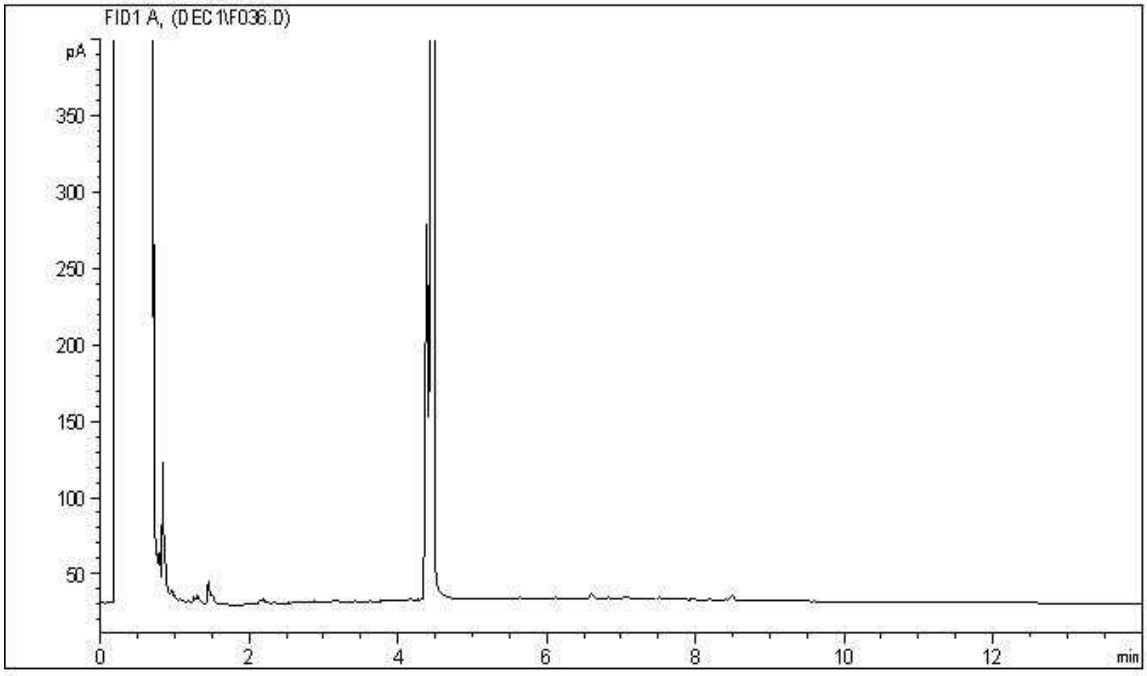
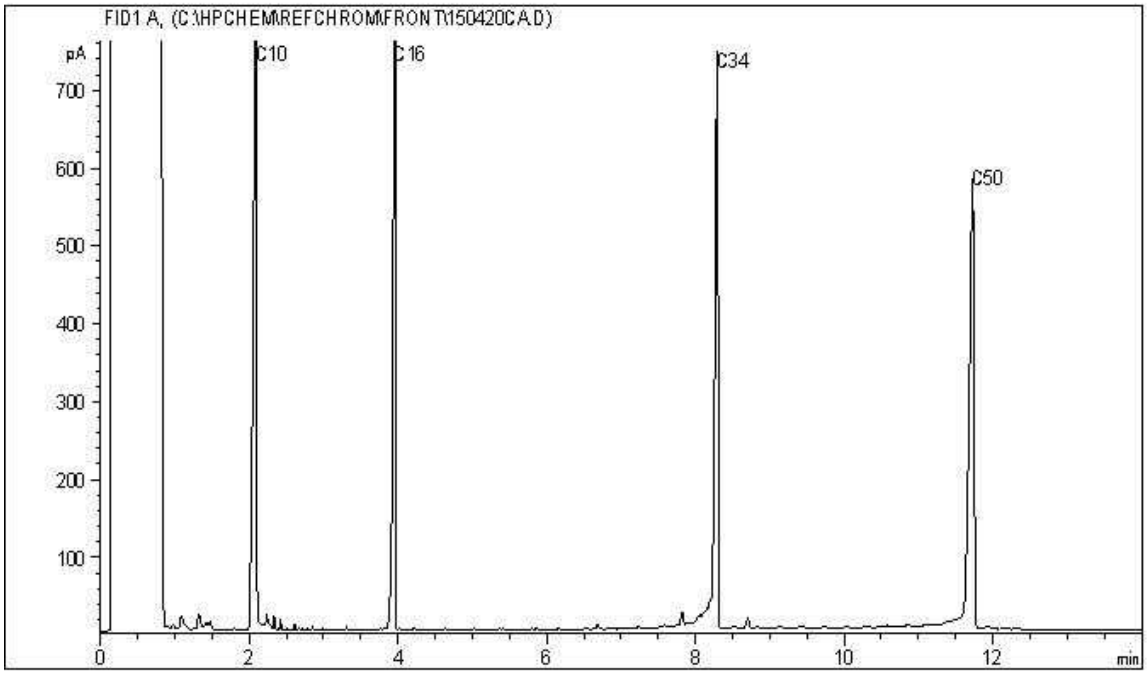
**CCME Hydrocarbons (F2-F4 in soil) Chromatogram**

Instrument: WGC1




Carbon Range Distribution - Reference Chromatogram




TYPICAL PRODUCT CARBON NUMBER RANGES

| | | | |
|---|---|---|---|
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| Varsol: | C8 - C12 | Lubricating Oils: | C20 - C40 |

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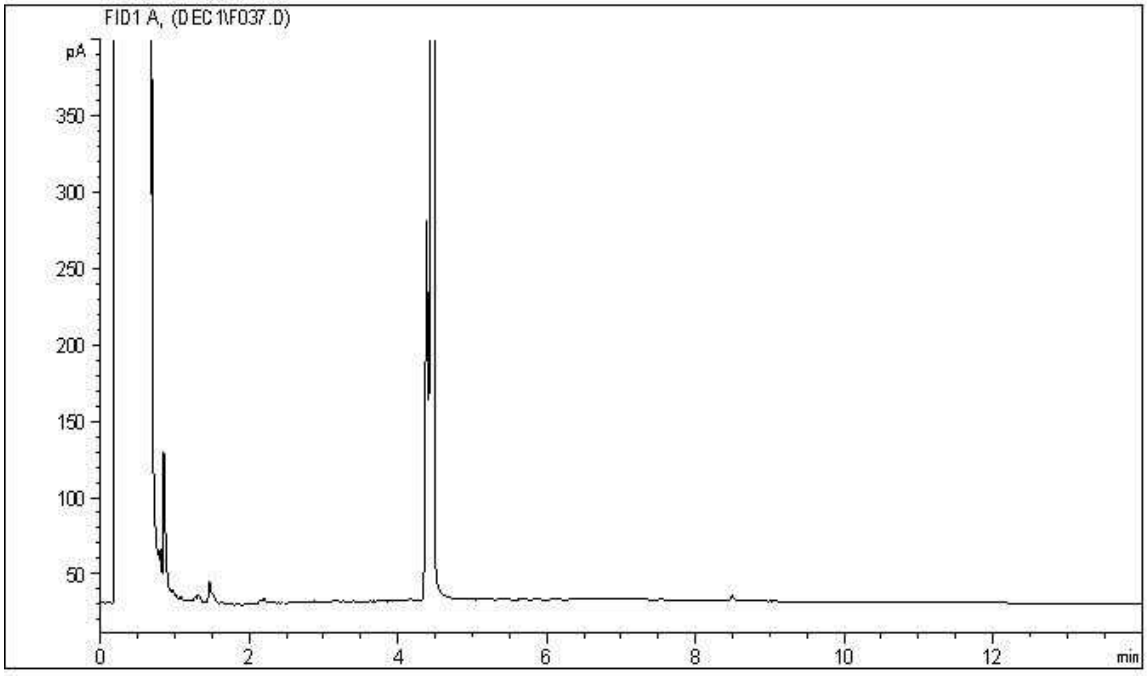
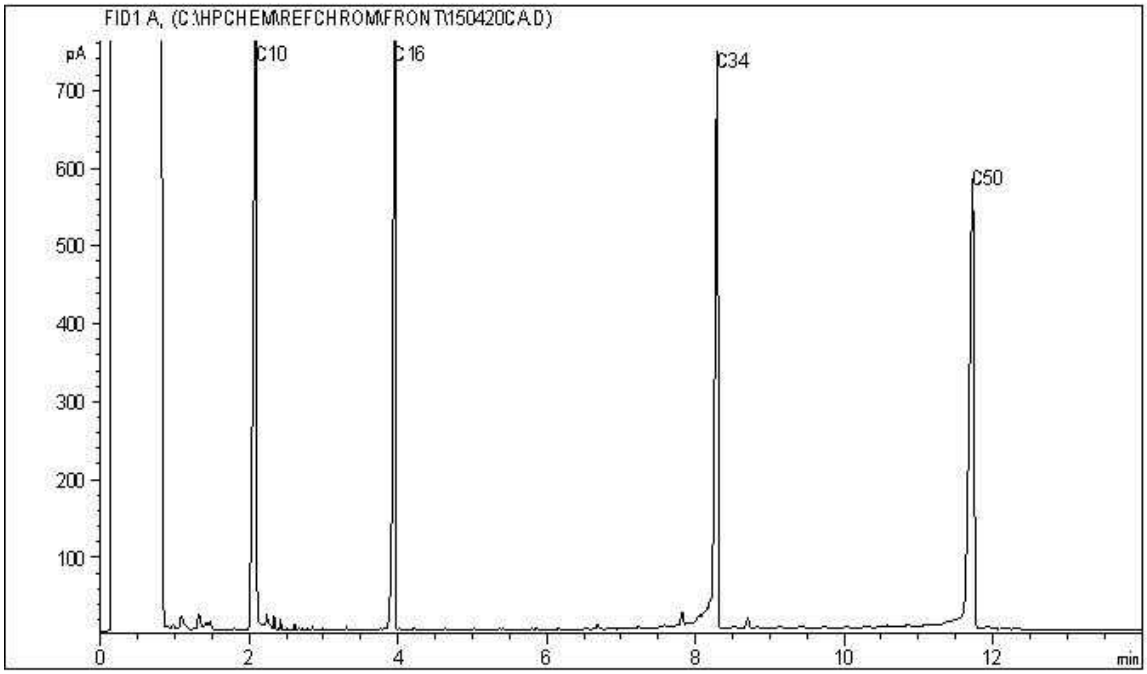
**CCME Hydrocarbons (F2-F4 in soil) Chromatogram**

Instrument: WGC1




Carbon Range Distribution - Reference Chromatogram




TYPICAL PRODUCT CARBON NUMBER RANGES

| | | | |
|---|---|---|---|
| Gasoline: | C4 - C12 | Diesel: | C8 - C22 |
| Varsol: | C8 - C12 | Lubricating Oils: | C20 - C40 |

**Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.**

Maxxam
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Success Through Science®

Your C.O.C. #: N000879

**Attention:SEAN MULVEY**

PINCHIN ENVIRONMENTAL LTD
54 Terracon Pl.
Winnipeg, MB
CANADA R2J 4G7

**Report Date: 2015/12/08**
Report #: R2092047
Version: 1 - Final

# CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B5A7987**
**Received: 2015/12/04, 11:55**

Sample Matrix: Water
# Samples Received: 3

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Analytical Method |
|---|---|---|---|---|---|
| CCME Hydrocarbons (F2-F4 in water) | 1 | 2015/12/07 | 2015/12/01 | WINSOP-00056 | CCME PHC-CWS |
| CCME Hydrocarbons (F2-F4 in water) | 2 | 2015/12/07 | 2015/12/07 | WINSOP-00056 | CCME PHC-CWS |
| VOCs, VH, F1, LH in Water by HS GC/MS (1) | 3 | 2015/12/07 | 2015/12/07 | BBY8SOP-00009 | EPA 8260c R3 m |
| Volatile F1-BTEX (1) | 3 | N/A | 2015/12/08 | BBY WI-00033 | Auto Calc |

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Vancouver

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Amanda Hung, B.Sc., Project Manager
Email: AHung@maxxam.ca
Phone# (204)772-7276 Ext:2215

==========

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

Maxxam Job #: B5A7987
Report Date: 2015/12/08

PINCHIN ENVIRONMENTAL LTD

## RESULTS OF CHEMICAL ANALYSES OF WATER

| **Maxxam ID** | | NT8693 | NT8704 | NT8705 | | |
|---|---|---|---|---|---|---|
| **Sampling Date** | | 2015/12/03 12:00 | 2015/12/03 12:00 | 2015/12/03 12:00 | | |
| **COC Number** | | N000879 | N000879 | N000879 | | |
| | **UNITS** | **MW1** | **MW2** | **MW5** | **RDL** | **QC Batch** |
| **Calculated Parameters** | | | | | | |
| F1 (C6-C10) - BTEX | ug/L | <300 | <300 | <300 | 300 | 8134203 |
| RDL = Reportable Detection Limit | | | | | | |



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Maxxam Job #: B5A7987
Report Date: 2015/12/08

PINCHIN ENVIRONMENTAL LTD

## PETROLEUM HYDROCARBONS (CCME)

| Maxxam ID | | NT8693 | NT8704 | NT8705 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2015/12/03 12:00 | 2015/12/03 12:00 | 2015/12/03 12:00 | | |
| COC Number | | N000879 | N000879 | N000879 | | |
| | UNITS | MW1 | MW2 | MW5 | RDL | QC Batch |
| **Ext. Pet. Hydrocarbon** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | mg/L | <0.15 | 0.49 | <0.15 | 0.15 | 8135911 |
| F3 (C16-C34 Hydrocarbons) | mg/L | <0.15 | <0.15 | <0.15 | 0.15 | 8135911 |
| F4 (C34-C50 Hydrocarbons) | mg/L | <0.15 | <0.15 | <0.15 | 0.15 | 8135911 |
| **Surrogate Recovery (%)** | | | | | | |
| O-TERPHENYL (sur.) | % | 80 | 97 | 79 | | 8135911 |
| RDL = Reportable Detection Limit | | | | | | |



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Maxxam Job #: B5A7987
Report Date: 2015/12/08

PINCHIN ENVIRONMENTAL LTD

## VOLATILE ORGANICS BY GC-MS (WATER)

| Maxxam ID | | NT8693 | NT8704 | NT8705 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2015/12/03 12:00 | 2015/12/03 12:00 | 2015/12/03 12:00 | | |
| COC Number | | N000879 | N000879 | N000879 | | |
| | UNITS | MW1 | MW2 | MW5 | RDL | QC Batch |
| **Volatiles** | | | | | | |
| Chloromethane | ug/L | <1.0 | <1.0 | <1.0 | 1.0 | 8136644 |
| Vinyl chloride | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| Chloroethane | ug/L | <1.0 | <1.0 | <1.0 | 1.0 | 8136644 |
| Trichlorofluoromethane | ug/L | <4.0 | <4.0 | <4.0 | 4.0 | 8136644 |
| 1,1,2Trichloro-1,2,2Trifluoroethane | ug/L | <2.0 | <2.0 | <2.0 | 2.0 | 8136644 |
| Dichlorodifluoromethane | ug/L | <2.0 | <2.0 | <2.0 | 2.0 | 8136644 |
| 1,1-dichloroethene | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| Dichloromethane | ug/L | <2.0 | <2.0 | <2.0 | 2.0 | 8136644 |
| trans-1,2-dichloroethene | ug/L | <1.0 | <1.0 | <1.0 | 1.0 | 8136644 |
| 1,1-dichloroethane | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| cis-1,2-dichloroethene | ug/L | <1.0 | <1.0 | <1.0 | 1.0 | 8136644 |
| Chloroform | ug/L | 20 | <1.0 | <1.0 | 1.0 | 8136644 |
| 1,1,1-trichloroethane | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| 1,2-dichloroethane | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| Carbon tetrachloride | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| Benzene | ug/L | <0.40 | <0.40 | <0.40 | 0.40 | 8136644 |
| Methyl-tert-butylether (MTBE) | ug/L | <4.0 | <4.0 | <4.0 | 4.0 | 8136644 |
| 1,2-dichloropropane | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| cis-1,3-dichloropropene | ug/L | <1.0 | <1.0 | <1.0 | 1.0 | 8136644 |
| trans-1,3-dichloropropene | ug/L | <1.0 | <1.0 | <1.0 | 1.0 | 8136644 |
| Bromomethane | ug/L | <1.0 | <1.0 | <1.0 | 1.0 | 8136644 |
| 1,1,2-trichloroethane | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| Trichloroethene | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| Chlorodibromomethane | ug/L | <1.0 | <1.0 | <1.0 | 1.0 | 8136644 |
| 1,2-dibromoethane | ug/L | <0.20 | <0.20 | <0.20 | 0.20 | 8136644 |
| Tetrachloroethene | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| Bromodichloromethane | ug/L | 3.0 | <1.0 | <1.0 | 1.0 | 8136644 |
| Toluene | ug/L | <0.40 | <0.40 | <0.40 | 0.40 | 8136644 |
| Ethylbenzene | ug/L | <0.40 | <0.40 | <0.40 | 0.40 | 8136644 |
| m & p-Xylene | ug/L | <0.40 | <0.40 | <0.40 | 0.40 | 8136644 |
| Bromoform | ug/L | <1.0 | <1.0 | <1.0 | 1.0 | 8136644 |
| Styrene | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| o-Xylene | ug/L | <0.40 | <0.40 | <0.40 | 0.40 | 8136644 |
| Xylenes (Total) | ug/L | <0.40 | <0.40 | <0.40 | 0.40 | 8136644 |
| 1,1,1,2-tetrachloroethane | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| 1,1,2,2-tetrachloroethane | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| 1,2-dichlorobenzene | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| RDL = Reportable Detection Limit | | | | | | |



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Maxxam Job #: B5A7987
Report Date: 2015/12/08

PINCHIN ENVIRONMENTAL LTD

## VOLATILE ORGANICS BY GC-MS (WATER)

| Maxxam ID | | NT8693 | NT8704 | NT8705 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2015/12/03 12:00 | 2015/12/03 12:00 | 2015/12/03 12:00 | | |
| COC Number | | N000879 | N000879 | N000879 | | |
| | UNITS | MW1 | MW2 | MW5 | RDL | QC Batch |
| 1,3-dichlorobenzene | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| 1,4-dichlorobenzene | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| Chlorobenzene | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| 1,2,3-trichlorobenzene | ug/L | <2.0 | <2.0 | <2.0 | 2.0 | 8136644 |
| 1,2,4-trichlorobenzene | ug/L | <2.0 | <2.0 | <2.0 | 2.0 | 8136644 |
| Hexachlorobutadiene | ug/L | <0.50 | <0.50 | <0.50 | 0.50 | 8136644 |
| F1 (C6-C10) | ug/L | <300 | <300 | <300 | 300 | 8136644 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene (sur.) | % | 101 | 100 | 101 | | 8136644 |
| 4-Bromofluorobenzene (sur.) | % | 97 | 98 | 97 | | 8136644 |
| D4-1,2-Dichloroethane (sur.) | % | 102 | 103 | 104 | | 8136644 |
| RDL = Reportable Detection Limit | | | | | | |



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Maxxam Job #: B5A7987
Report Date: 2015/12/08

PINCHIN ENVIRONMENTAL LTD

## GENERAL COMMENTS

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



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Maxxam Job #: B5A7987
Report Date: 2015/12/08

## QUALITY ASSURANCE REPORT

PINCHIN ENVIRONMENTAL LTD

| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | |
|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 8135911 | O-TERPHENYL (sur.) | 2015/12/07 | 92 | 50 - 130 | 90 | 50 - 130 | 91 | % | | |
| 8136644 | 1,4-Difluorobenzene (sur.) | 2015/12/07 | 99 | 70 - 130 | 101 | 70 - 130 | 101 | % | | |
| 8136644 | 4-Bromofluorobenzene (sur.) | 2015/12/07 | 103 | 70 - 130 | 102 | 70 - 130 | 94 | % | | |
| 8136644 | D4-1,2-Dichloroethane (sur.) | 2015/12/07 | 99 | 70 - 130 | 97 | 70 - 130 | 95 | % | | |
| 8135911 | F2 (C10-C16 Hydrocarbons) | 2015/12/07 | 89 | 50 - 130 | 90 | 70 - 130 | <0.15 | mg/L | NC | 40 |
| 8135911 | F3 (C16-C34 Hydrocarbons) | 2015/12/07 | 98 | 50 - 130 | 102 | 70 - 130 | <0.15 | mg/L | NC | 40 |
| 8135911 | F4 (C34-C50 Hydrocarbons) | 2015/12/07 | 82 | 50 - 130 | 85 | 70 - 130 | <0.15 | mg/L | NC | 40 |
| 8136644 | 1,1,1,2-tetrachloroethane | 2015/12/07 | 94 | 70 - 130 | 92 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | 1,1,1-trichloroethane | 2015/12/07 | 96 | 70 - 130 | 92 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | 1,1,2,2-tetrachloroethane | 2015/12/07 | 97 | 70 - 130 | 94 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | 1,1,2Trichloro-1,2,2Trifluoroethane | 2015/12/07 | | | | | <2.0 | ug/L | NC | 30 |
| 8136644 | 1,1,2-trichloroethane | 2015/12/07 | 94 | 70 - 130 | 92 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | 1,1-dichloroethane | 2015/12/07 | 90 | 70 - 130 | 87 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | 1,1-dichloroethene | 2015/12/07 | 97 | 70 - 130 | 94 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | 1,2,3-trichlorobenzene | 2015/12/07 | 100 | 70 - 130 | 101 | 70 - 130 | <2.0 | ug/L | | |
| 8136644 | 1,2,4-trichlorobenzene | 2015/12/07 | 99 | 70 - 130 | 100 | 70 - 130 | <2.0 | ug/L | | |
| 8136644 | 1,2-dibromoethane | 2015/12/07 | 92 | 70 - 130 | 89 | 70 - 130 | <0.20 | ug/L | | |
| 8136644 | 1,2-dichlorobenzene | 2015/12/07 | 101 | 70 - 130 | 99 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | 1,2-dichloroethane | 2015/12/07 | 91 | 70 - 130 | 88 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | 1,2-dichloropropane | 2015/12/07 | 95 | 70 - 130 | 92 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | 1,3-dichlorobenzene | 2015/12/07 | 102 | 70 - 130 | 98 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | 1,4-dichlorobenzene | 2015/12/07 | 98 | 70 - 130 | 96 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | Benzene | 2015/12/07 | 95 | 70 - 130 | 91 | 70 - 130 | <0.40 | ug/L | NC | 30 |
| 8136644 | Bromodichloromethane | 2015/12/07 | 93 | 70 - 130 | 89 | 70 - 130 | <1.0 | ug/L | NC | 30 |
| 8136644 | Bromoform | 2015/12/07 | 95 | 70 - 130 | 91 | 70 - 130 | <1.0 | ug/L | NC | 30 |
| 8136644 | Bromomethane | 2015/12/07 | 96 | 60 - 140 | 93 | 60 - 140 | <1.0 | ug/L | NC | 30 |
| 8136644 | Carbon tetrachloride | 2015/12/07 | 95 | 70 - 130 | 92 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | Chlorobenzene | 2015/12/07 | 86 | 70 - 130 | 86 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | Chlorodibromomethane | 2015/12/07 | 92 | 70 - 130 | 90 | 70 - 130 | <1.0 | ug/L | NC | 30 |
| 8136644 | Chloroethane | 2015/12/07 | 66 | 60 - 140 | 66 | 60 - 140 | <1.0 | ug/L | NC | 30 |
| 8136644 | Chloroform | 2015/12/07 | 95 | 70 - 130 | 91 | 70 - 130 | <1.0 | ug/L | NC | 30 |
| 8136644 | Chloromethane | 2015/12/07 | 103 | 60 - 140 | 101 | 60 - 140 | <1.0 | ug/L | NC | 30 |



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## QUALITY ASSURANCE REPORT(CONT'D)

PINCHIN ENVIRONMENTAL LTD

| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | |
|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 8136644 | cis-1,2-dichloroethene | 2015/12/07 | 99 | 70 - 130 | 95 | 70 - 130 | <1.0 | ug/L | NC | 30 |
| 8136644 | cis-1,3-dichloropropene | 2015/12/07 | 96 | 70 - 130 | 92 | 70 - 130 | <1.0 | ug/L | NC | 30 |
| 8136644 | Dichlorodifluoromethane | 2015/12/07 | 104 | 60 - 140 | 103 | 60 - 140 | <2.0 | ug/L | NC | 30 |
| 8136644 | Dichloromethane | 2015/12/07 | 99 | 70 - 130 | 95 | 70 - 130 | <2.0 | ug/L | NC | 30 |
| 8136644 | Ethylbenzene | 2015/12/07 | 97 | 70 - 130 | 97 | 70 - 130 | <0.40 | ug/L | NC | 30 |
| 8136644 | F1 (C6-C10) | 2015/12/07 | | | 92 | 70 - 130 | <300 | ug/L | | |
| 8136644 | Hexachlorobutadiene | 2015/12/07 | 105 | 70 - 130 | 102 | 70 - 130 | <0.50 | ug/L | | |
| 8136644 | m & p-Xylene | 2015/12/07 | 102 | 70 - 130 | 101 | 70 - 130 | <0.40 | ug/L | NC | 30 |
| 8136644 | Methyl-tert-butylether (MTBE) | 2015/12/07 | 105 | 70 - 130 | 103 | 70 - 130 | <4.0 | ug/L | NC | 30 |
| 8136644 | o-Xylene | 2015/12/07 | 99 | 70 - 130 | 100 | 70 - 130 | <0.40 | ug/L | NC | 30 |
| 8136644 | Styrene | 2015/12/07 | 83 | 70 - 130 | 85 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | Tetrachloroethene | 2015/12/07 | 96 | 70 - 130 | 92 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | Toluene | 2015/12/07 | 95 | 70 - 130 | 92 | 70 - 130 | <0.40 | ug/L | NC | 30 |
| 8136644 | trans-1,2-dichloroethene | 2015/12/07 | 87 | 70 - 130 | 84 | 70 - 130 | <1.0 | ug/L | NC | 30 |
| 8136644 | trans-1,3-dichloropropene | 2015/12/07 | 81 | 70 - 130 | 78 | 70 - 130 | <1.0 | ug/L | NC | 30 |
| 8136644 | Trichloroethene | 2015/12/07 | 95 | 70 - 130 | 92 | 70 - 130 | <0.50 | ug/L | NC | 30 |
| 8136644 | Trichlorofluoromethane | 2015/12/07 | 119 | 60 - 140 | 63 | 60 - 140 | <4.0 | ug/L | NC | 30 |
| 8136644 | Vinyl chloride | 2015/12/07 | 102 | 60 - 140 | 100 | 60 - 140 | <0.50 | ug/L | NC | 30 |
| 8136644 | Xylenes (Total) | 2015/12/07 | | | | | <0.40 | ug/L | NC | 30 |

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

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

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

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).



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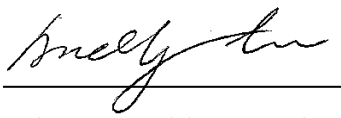
Maxxam Job #: B5A7987
Report Date: 2015/12/08

PINCHIN ENVIRONMENTAL LTD

## VALIDATION SIGNATURE PAGE

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



Andy Lu, Data Validation Coordinator

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



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# CHAIN OF CUSTODY RECORD

Maxxam
Unit D, 675 Berry St., Winnipeg, MB R3H 1A7
Phone: 204-772-7276 Fax: 204-772-2386 Toll Free: (866) 800-6208

Page 1 of ____

| INVOICE INFORMATION | REPORT INFORMATION (if different from invoice) | PROJECT INFORMATION | MAXXAM JOB NUMBER |
|---|---|---|---|
| Company Name: PINCHIN | Company Name: | Quotation #: | B5A7987 |
| Contact Name: SEAN MULVEY | Contact Name: | P.O. #: | CHAIN OF CUSTODY # |
| Address: 54 TERRACON PL | Address: | Project #: | N000879 |
| WINNIPEG | | Project Name: | |
| Phone: 792 6583 Fax: | Phone: Fax: | Location: | |
| Email: smulvey@pinchin.com | Email: | Sampled By: | |

**REGULATORY REQUIREMENTS SERVICE REQUESTED:**

- [ ] CCME
- [ ] DRINKING WATER
- [x] Other: MOECC TABLE 3 STANDARDS

**Special Instructions:**

**SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM.**

**ANALYSIS REQUESTED (Please be specific)**

**TURNAROUND TIME (TAT) REQUIRED**

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS.

Regular (Standard) TAT:
- [ ] 5 to 7 Working Days

Rush TAT:
- [ ] 1 day
- [x] 2 days
- [ ] 3 days

DATE Required: ____

TIME Required: ____

*TATs for certain tests are > 5 days. Please contact your Project Manager for details*

| | Lab Use | Sample Identification | Date Sampled | Time Sampled | Matrix (GW, SW, Soil etc) | Drinking Water? (Y / N) | Coliforms: Total / Fecal / MPN / MF; E. coli; QT | Field Filtered? Y / N | Field Acidified? Y / N | Field Acidified? Y / N | Dissolved Metals | Total Metal | BTEX | BTEX / F1 | F2 - F4 | PCB | Biochemical Oxygen Demand | VOCs | HOLD - DO NOT ANALYZE | # of Cont. | COMMENTS / TAT COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | NT8693 | MW1 | 3/12/2015 | pm | GW | | | | | | | | | x | x | | | x | | 4 | |
| 2 | NT8704 | MW2 | ↓ | ↓ | ↓ | | | | | | | | | x | x | | | x | | ↓ | |
| 3 | NT8705 | MW5 | | | | | | | | | | | | x | x | | | x | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | |

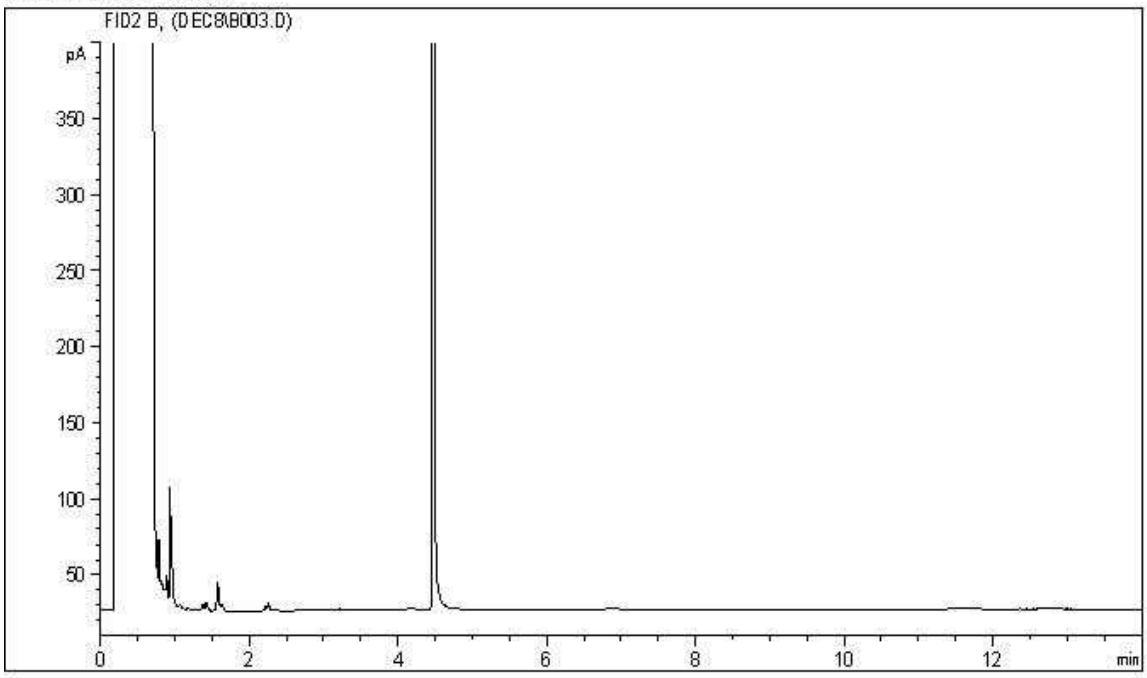
| RELINQUISHED BY (Signature/Print) | RECEIVED BY (Signature/Print) | Date | Time | #JARS USED AND NOT SUBMITTED | Laboratory Use Only |
|---|---|---|---|---|---|
| SEAN MULVEY | | 15/12/04 | 1155 | | Temperature (°C) on Receipt: 4.5, 3.9, 2.9 ice present |

***MANDATORY SECTIONS IN GREY MUST BE FILLED OUT. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.**

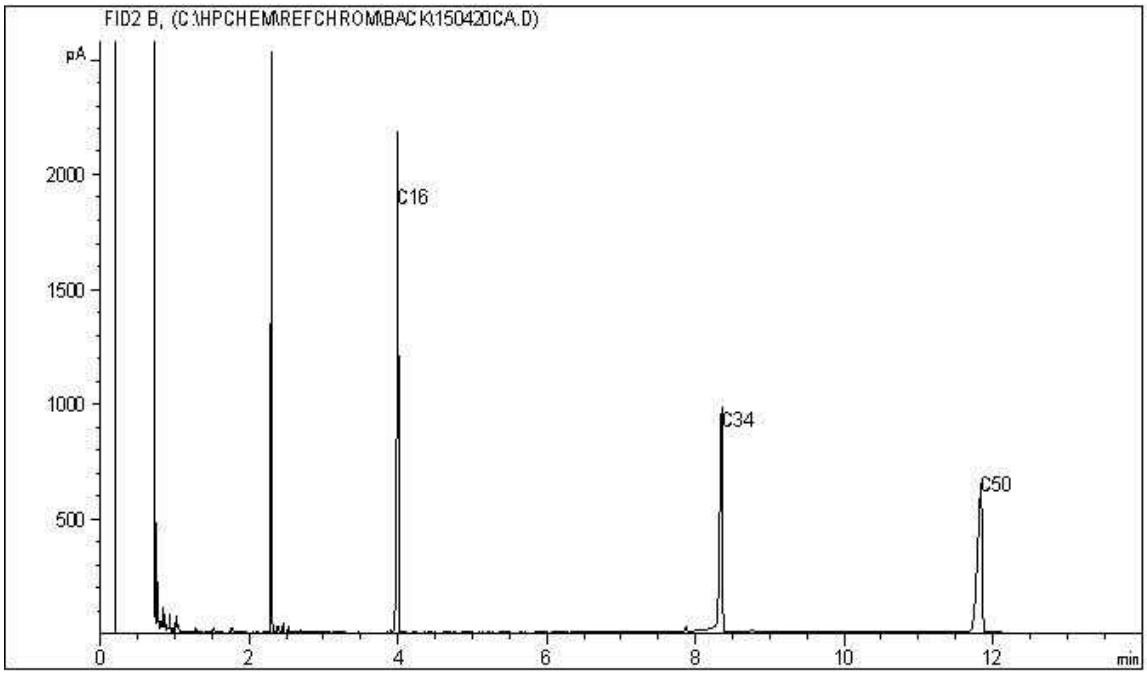
CoC-1028 - WINFCD-00161/1 Maxxam International Corporation o/a Maxxam White: Maxxam Yellow: Client Copy

**CCME Hydrocarbons (F2-F4 in water) Chromatogram**

Instrument: WGC1




Carbon Range Distribution - Reference Chromatogram




TYPICAL PRODUCT CARBON NUMBER RANGES

| | | | |
|---|---|---|---|
| Gasoline: | C4 - C12 | Diesel: | C8 - C22 |
| Varsol: | C8 - C12 | Lubricating Oils: | C20 - C40 |

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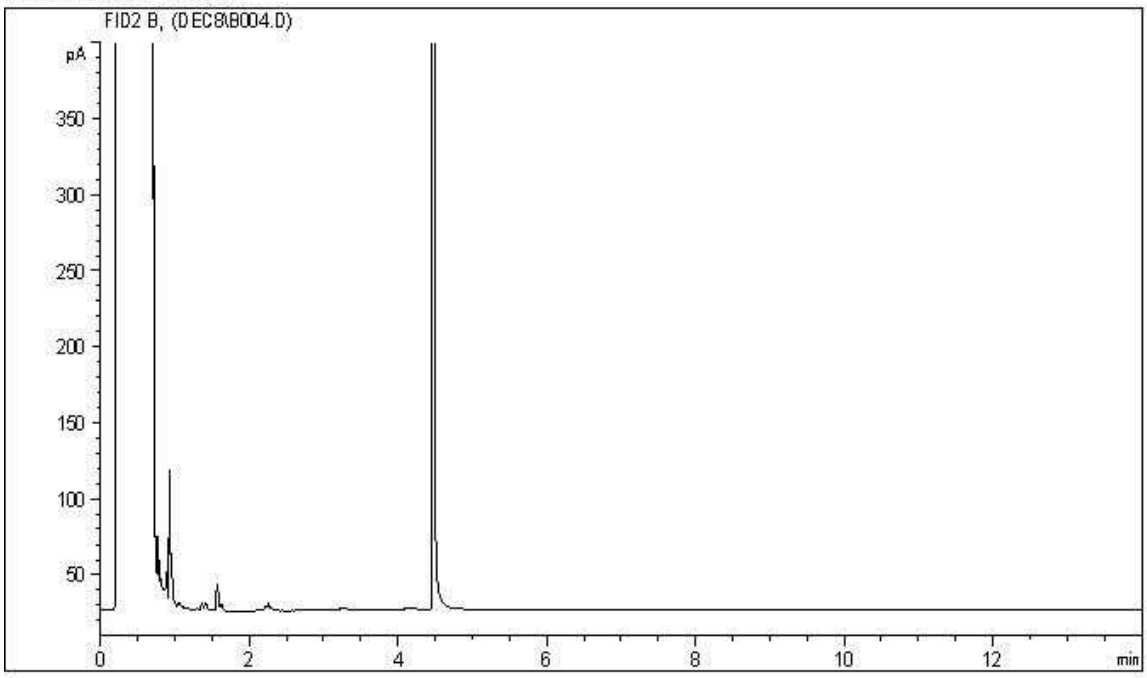


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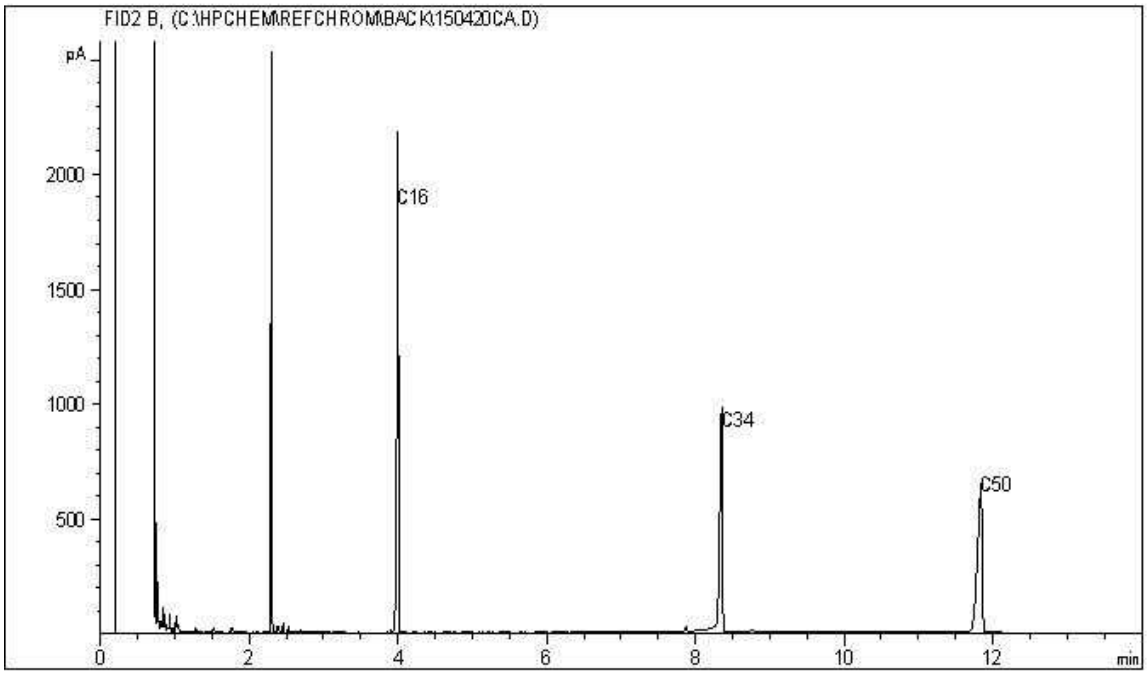


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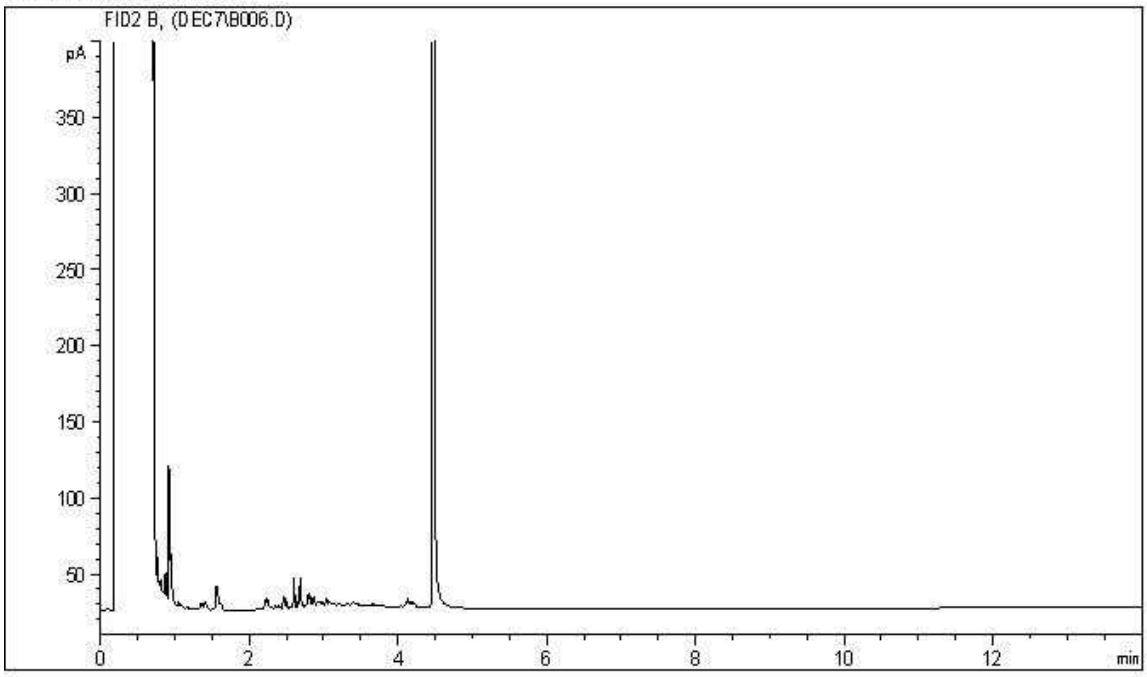


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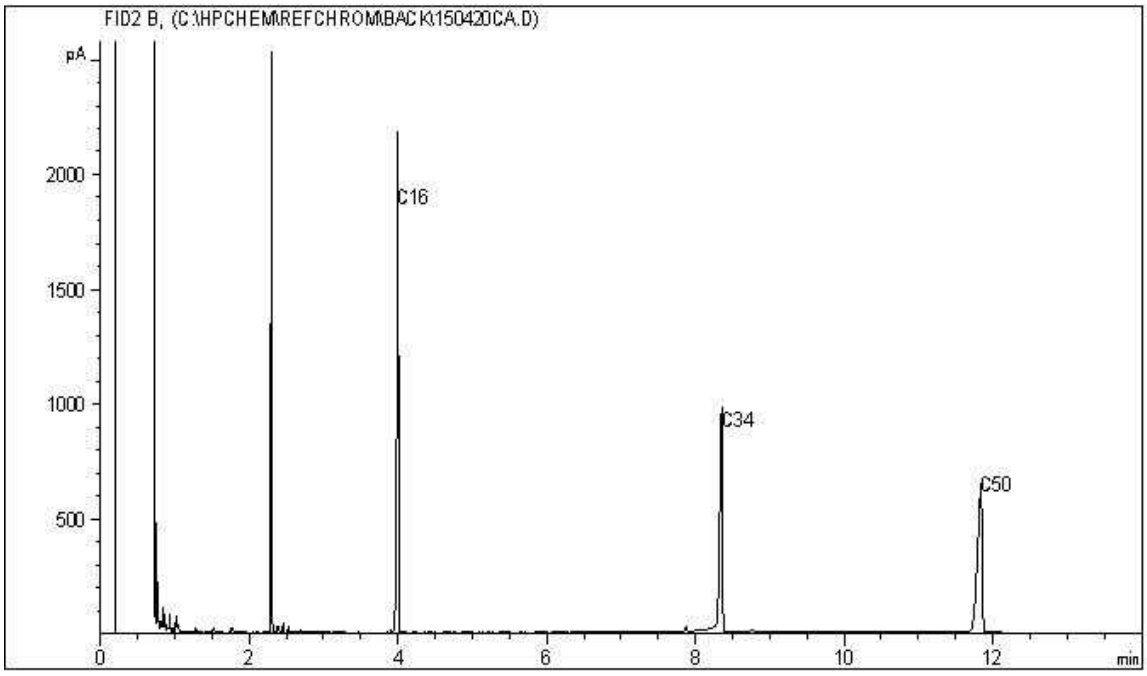


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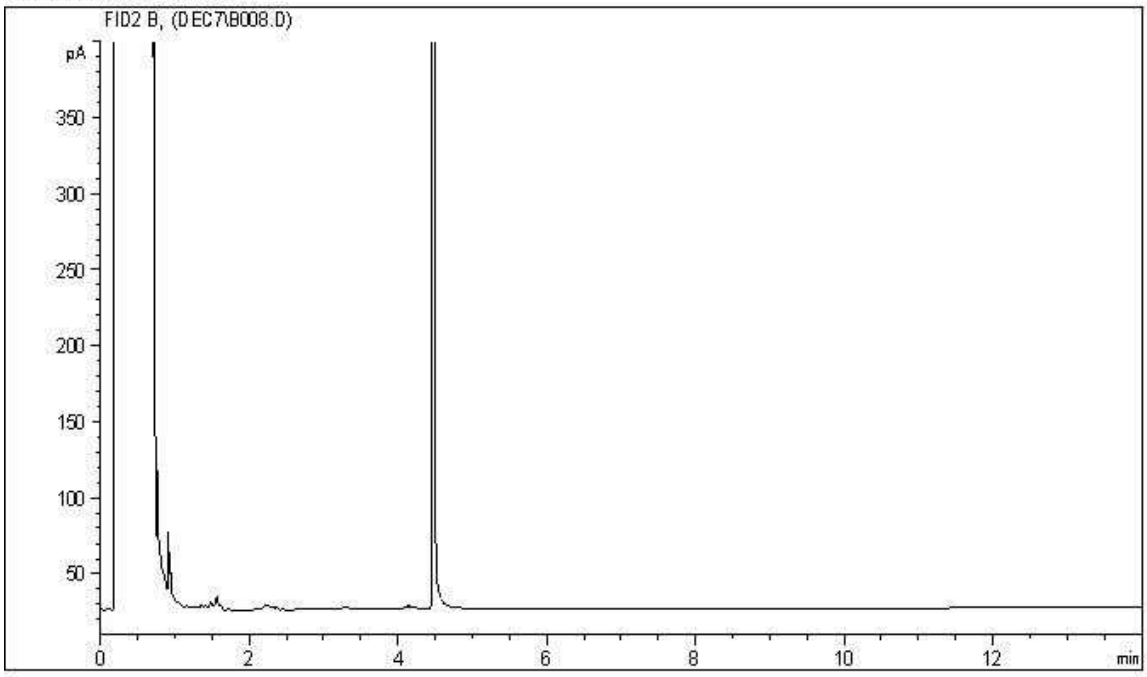


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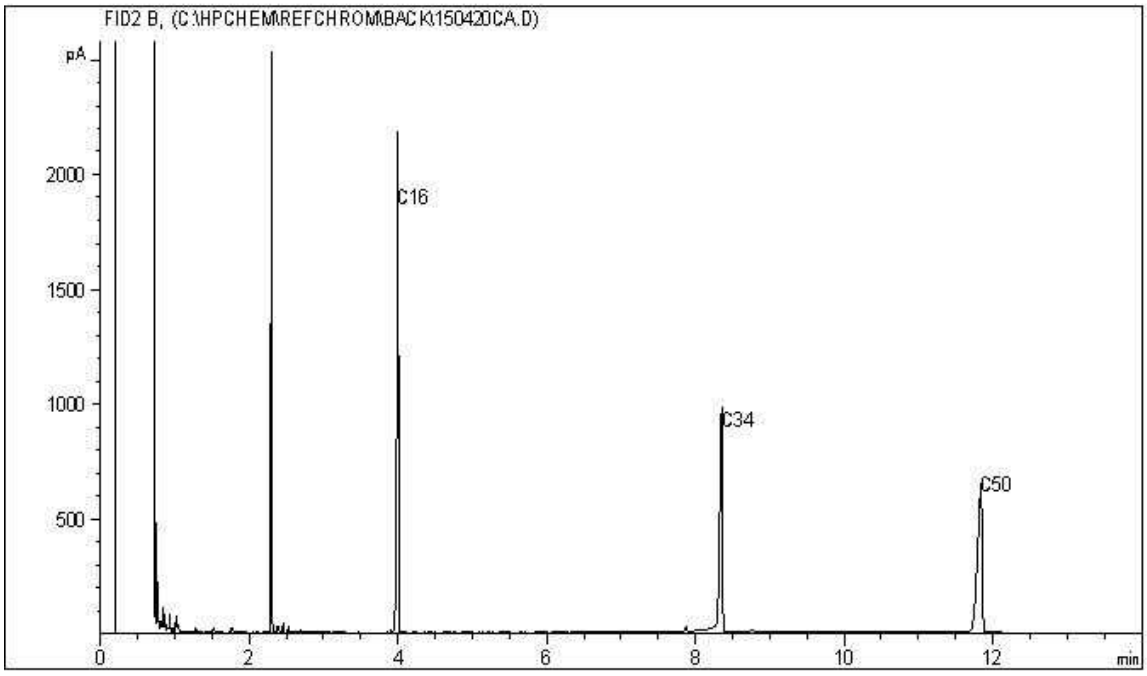


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Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: 110069.002
Your C.O.C. #: N000084

**Attention:SEAN MULVEY**

PINCHIN ENVIRONMENTAL LTD
54 Terracon Pl.
Winnipeg, MB
CANADA R2J 4G7

**Report Date: 2016/01/06**
Report #: R2110440
Version: 2 - Revision

# CERTIFICATE OF ANALYSIS – REVISED REPORT

**MAXXAM JOB #: B5B4143**
**Received: 2015/12/30, 12:10**

Sample Matrix: Water
# Samples Received: 2

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Analytical Method |
|---|---|---|---|---|---|
| BTEX/MTBE LH, VH, F1 SIM/MS (1) | 2 | 2015/12/31 | 2015/12/31 | BBY8SOP-00010/11 | EPA 8260c R3 m |
| CCME Hydrocarbons (F2-F4 in water) (1) | 2 | 2016/01/04 | 2016/01/04 | BBY8SOP-00030 | CCME PHC-CWS m |
| Volatile F1-BTEX (1) | 2 | N/A | 2016/01/04 | BBY WI-00033 | Auto Calc |

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Vancouver

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Amanda Hung, B.Sc., Project Manager
Email: AHung@maxxam.ca
Phone# (204)772-7276 Ext:2215
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Maxxam Analytics International Corporation o/a Maxxam Analytics Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Maxxam Job #: B5B4143
Report Date: 2016/01/06

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.002

## CCME BTEX/F1-F4 IN WATER (WATER)

| Maxxam ID | | NX2181 | NX2182 | | |
|---|---|---|---|---|---|
| Sampling Date | | 2015/12/29 12:00 | 2015/12/29 12:00 | | |
| COC Number | | N000084 | N000084 | | |
| | UNITS | MW 3 | MW 4 | RDL | QC Batch |
| **Calculated Parameters** | | | | | |
| F1 (C6-C10) - BTEX | ug/L | <300 | <300 | 300 | 8156374 |
| **Ext. Pet. Hydrocarbon** | | | | | |
| F2 (C10-C16 Hydrocarbons) | mg/L | 0.16 | <0.15 | 0.15 | 8158084 |
| F3 (C16-C34 Hydrocarbons) | mg/L | 0.28 | <0.20 | 0.20 | 8158084 |
| F4 (C34-C50 Hydrocarbons) | mg/L | <0.20 | <0.20 | 0.20 | 8158084 |
| **Volatiles** | | | | | |
| Methyl-tert-butylether (MTBE) | ug/L | <4.0 | <4.0 | 4.0 | 8156844 |
| Benzene | ug/L | <0.40 | <0.40 | 0.40 | 8156844 |
| Toluene | ug/L | <0.40 | <0.40 | 0.40 | 8156844 |
| Ethylbenzene | ug/L | <0.40 | <0.40 | 0.40 | 8156844 |
| m & p-Xylene | ug/L | <0.40 | <0.40 | 0.40 | 8156844 |
| o-Xylene | ug/L | <0.40 | <0.40 | 0.40 | 8156844 |
| Xylenes (Total) | ug/L | <0.40 | <0.40 | 0.40 | 8156844 |
| F1 (C6-C10) | ug/L | <300 | <300 | 300 | 8156844 |
| **Surrogate Recovery (%)** | | | | | |
| 1,4-Difluorobenzene (sur.) | % | 106 | 104 | | 8156844 |
| 4-Bromofluorobenzene (sur.) | % | 102 | 102 | | 8156844 |
| D4-1,2-Dichloroethane (sur.) | % | 101 | 99 | | 8156844 |
| O-TERPHENYL (sur.) | % | 112 | 105 | | 8158084 |
| RDL = Reportable Detection Limit | | | | | |



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Maxxam Job #: B5B4143
Report Date: 2016/01/06

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.002

## GENERAL COMMENTS

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



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Maxxam Job #: B5B4143
Report Date: 2016/01/06

## QUALITY ASSURANCE REPORT

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.002

| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | |
|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 8156844 | 1,4-Difluorobenzene (sur.) | 2015/12/31 | 100 | 70 - 130 | 101 | 70 - 130 | 103 | % | | |
| 8156844 | 4-Bromofluorobenzene (sur.) | 2015/12/31 | 101 | 70 - 130 | 100 | 70 - 130 | 101 | % | | |
| 8156844 | D4-1,2-Dichloroethane (sur.) | 2015/12/31 | 97 | 70 - 130 | 96 | 70 - 130 | 101 | % | | |
| 8158084 | O-TERPHENYL (sur.) | 2016/01/04 | 111 | 50 - 130 | 103 | 50 - 130 | 106 | % | | |
| 8156844 | Benzene | 2015/12/31 | 92 | 70 - 130 | 92 | 70 - 130 | <0.40 | ug/L | NC | 30 |
| 8156844 | Ethylbenzene | 2015/12/31 | 99 | 70 - 130 | 99 | 70 - 130 | <0.40 | ug/L | NC | 30 |
| 8156844 | F1 (C6-C10) | 2015/12/31 | | | 100 | 70 - 130 | <300 | ug/L | NC | 30 |
| 8156844 | m & p-Xylene | 2015/12/31 | 101 | 70 - 130 | 101 | 70 - 130 | <0.40 | ug/L | NC | 30 |
| 8156844 | Methyl-tert-butylether (MTBE) | 2015/12/31 | 93 | 70 - 130 | 92 | 70 - 130 | <4.0 | ug/L | NC | 30 |
| 8156844 | o-Xylene | 2015/12/31 | 99 | 70 - 130 | 98 | 70 - 130 | <0.40 | ug/L | NC | 30 |
| 8156844 | Toluene | 2015/12/31 | 92 | 70 - 130 | 92 | 70 - 130 | <0.40 | ug/L | NC | 30 |
| 8156844 | Xylenes (Total) | 2015/12/31 | | | | | <0.40 | ug/L | NC | 30 |
| 8158084 | F2 (C10-C16 Hydrocarbons) | 2016/01/04 | 77 | 70 - 130 | 110 | 70 - 130 | <0.15 | mg/L | NC | 40 |
| 8158084 | F3 (C16-C34 Hydrocarbons) | 2016/01/04 | | | | | <0.20 | mg/L | NC | 40 |
| 8158084 | F4 (C34-C50 Hydrocarbons) | 2016/01/04 | | | | | <0.20 | mg/L | NC | 40 |

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

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

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

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).



Maxxam Analytics International Corporation o/a Maxxam Analytics Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Maxxam Job #: B5B4143
Report Date: 2016/01/06

PINCHIN ENVIRONMENTAL LTD
Client Project #: 110069.002

## VALIDATION SIGNATURE PAGE

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

Rob Reinert, Data Validation Coordinator

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



Maxxam Analytics International Corporation o/a Maxxam Analytics Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

# CHAIN OF CUSTODY RECORD

Maxxam
Unit D, 675 Berry St., Winnipeg, MB R3H 1A7
Phone: 204-772-7276 Fax: 204-772-2386 Toll Free: (866) 800-6208

Page 1 of 1

| INVOICE INFORMATION | REPORT INFORMATION (if different from invoice) | PROJECT INFORMATION | MAXXAM JOB NUMBER |
|---|---|---|---|
| Company Name: PINCHIN | Company Name: | Quotation #: | B5B4143 |
| Contact Name: SEAN MULVEY | Contact Name: | P.O. #: | CHAIN OF CUSTODY # |
| Address: 54 TERRACON PL | Address: | Project #: 110069-002 | N 000084 |
| WINNIPEG | | Project Name: | |
| Phone: 792 6583 Fax: | Phone: Fax: | Location: | |
| Email: smulvey@pinchin.com | Email: | Sampled By: | |

**REGULATORY REQUIREMENTS SERVICE REQUESTED:**

- [ ] CCME
- [ ] DRINKING WATER
- [x] Other: MOECC TABLE 3 STANDARDS

**Special Instructions:**

**SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM.**

**ANALYSIS REQUESTED (Please be specific)**

**TURNAROUND TIME (TAT) REQUIRED**

**PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS.**

Regular (Standard) TAT:
- [ ] 5 to 7 Working Days

Rush TAT:
- [ ] 1 day
- [ ] 2 days
- [x] 3 days

DATE Required:

TIME Required:

*TATs for certain tests are > 5 days. Please contact your Project Manager for details*

| | Lab Use | Sample Identification | Date Sampled | Time Sampled | Matrix (GW, SW, Soil etc) | Drinking Water? (Y / N) | Coliforms: E. coli / Fecal / Total / MPN / MF / QT | Dissolved Metals: Field Filtered? | Field Acidified? | Total Metal: Field Acidified? | BTEX | BTEX / F1 | F2 - F4 | PCB | Biochemical Oxygen Demand | HOLD - DO NOT ANALYZE | # of Cont. | COMMENTS / TAT COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | NX 2181 | MW 3 | 29/12/2015 | pm | GW | | | N | | N | | x | x | | | | 4 | |
| 2 | NX 2182 | MW 4 | ↓ | ↓ | ↓ | | | N | | N | | x | x | | | | ↓ | |
| 3 | NX 2183 | MW 9 | | | | | | N | | N | | x | x | | | | | |
| 4 | NX 2184 | MW 10 | | | | | | N | | N | | x | x | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | |

| RELINQUISHED BY (Signature/Print) | RECEIVED BY (Signature/Print) | Date | Time | #JARS USED AND NOT SUBMITTED | Laboratory Use Only |
|---|---|---|---|---|---|
| SEAN MULVEY | SRobinson | 15/12/30 | 1210 | | Temperature (°C) on Receipt: 7.3, 6.2, 7.4 ice present |

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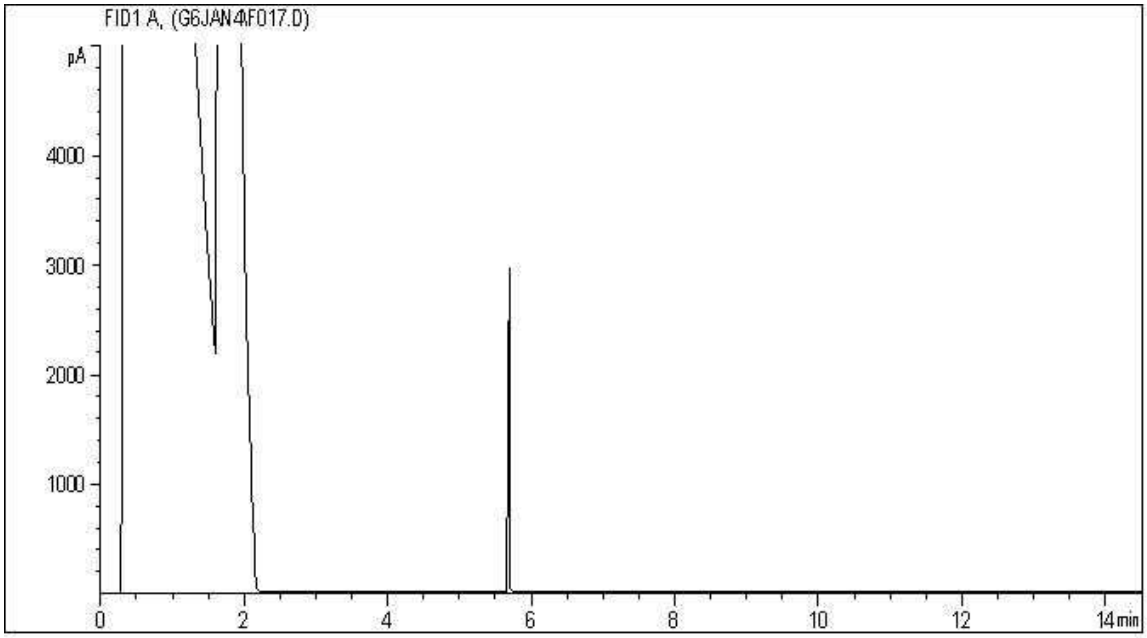
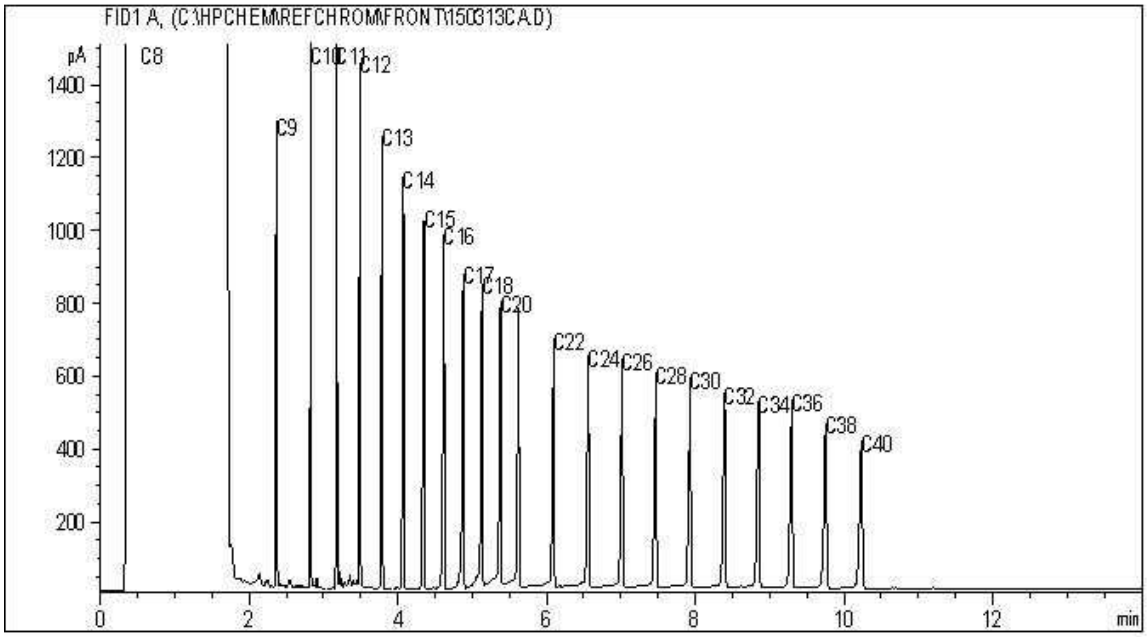



Carbon Range Distribution - Reference Chromatogram




TYPICAL PRODUCT CARBON NUMBER RANGES

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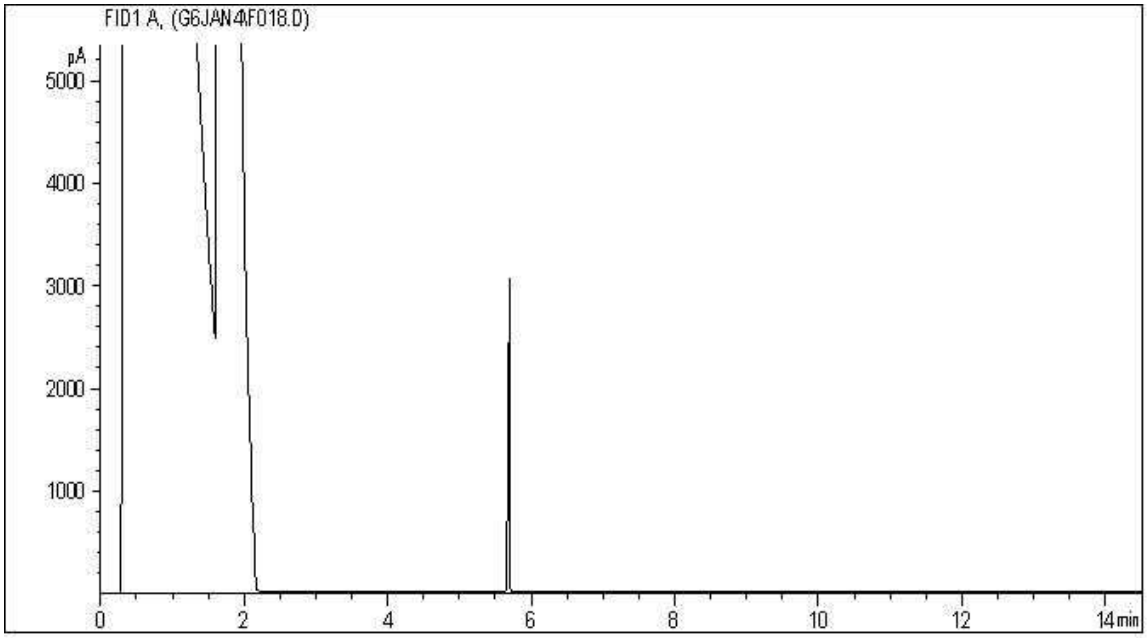


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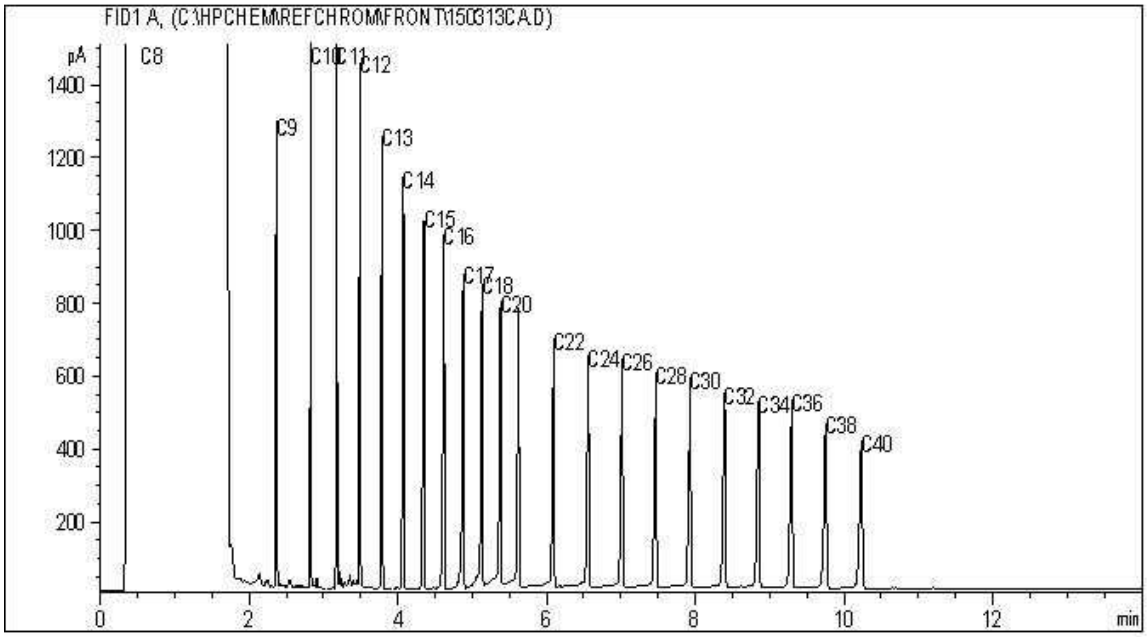


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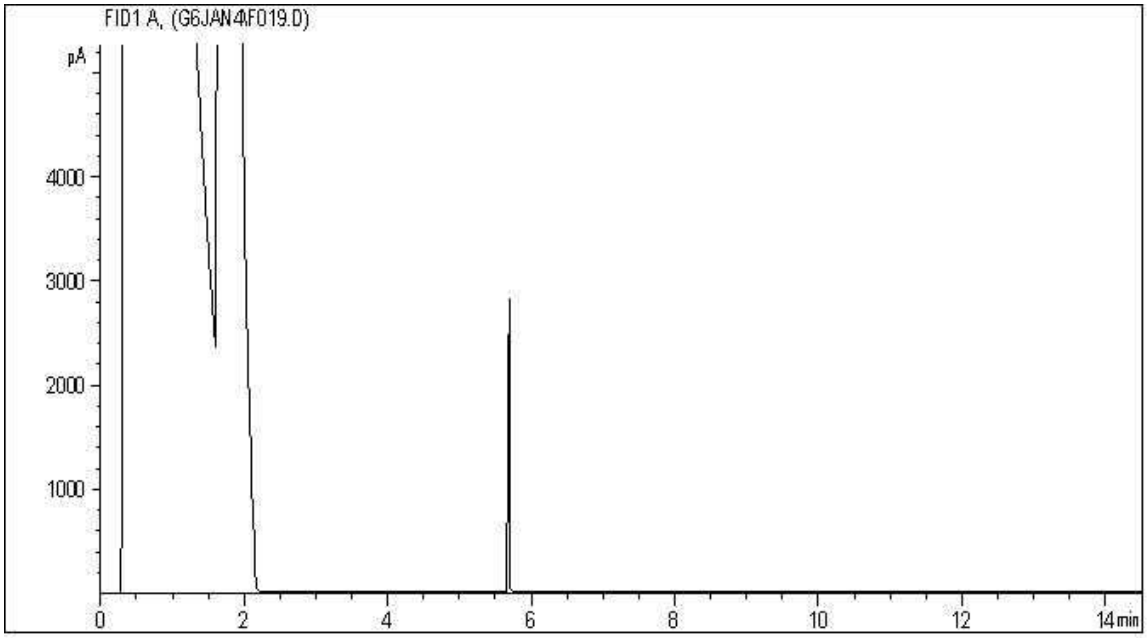


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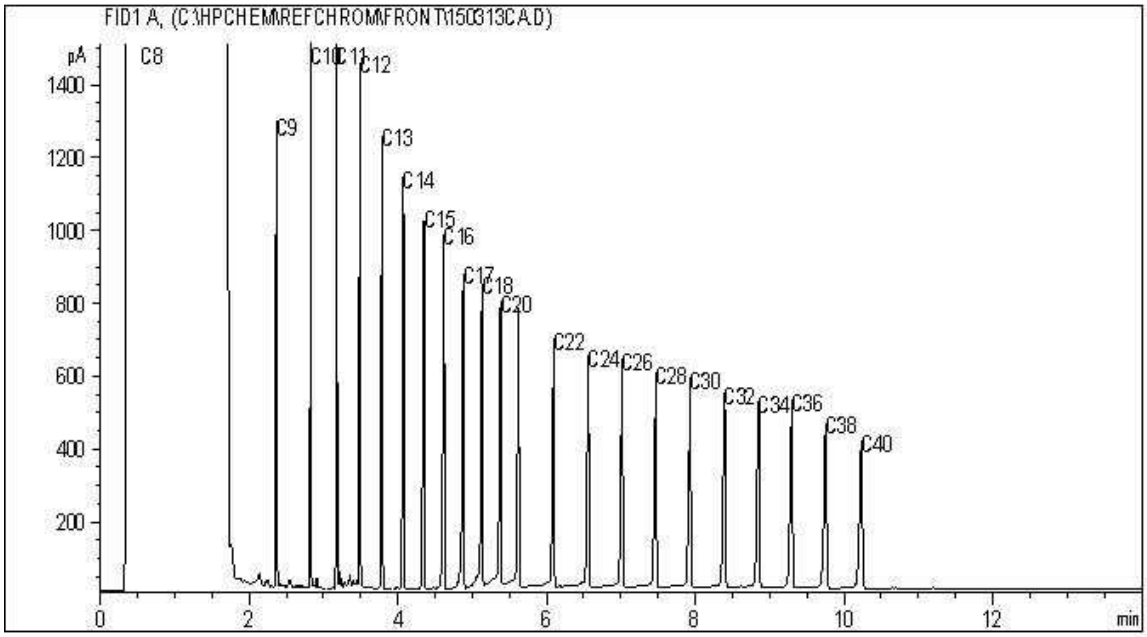


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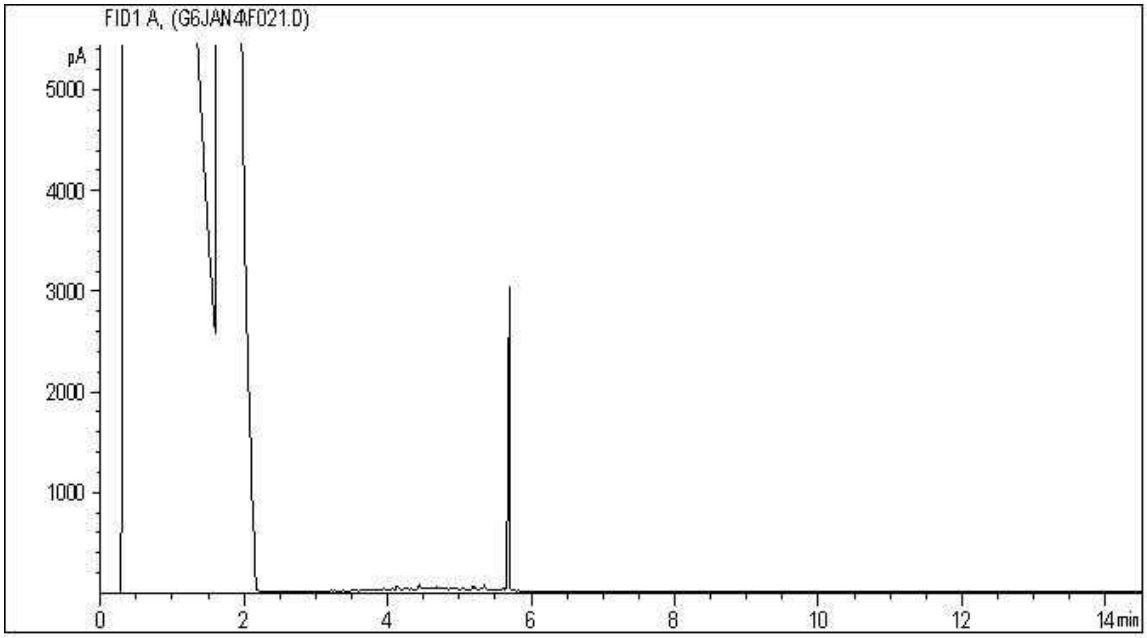


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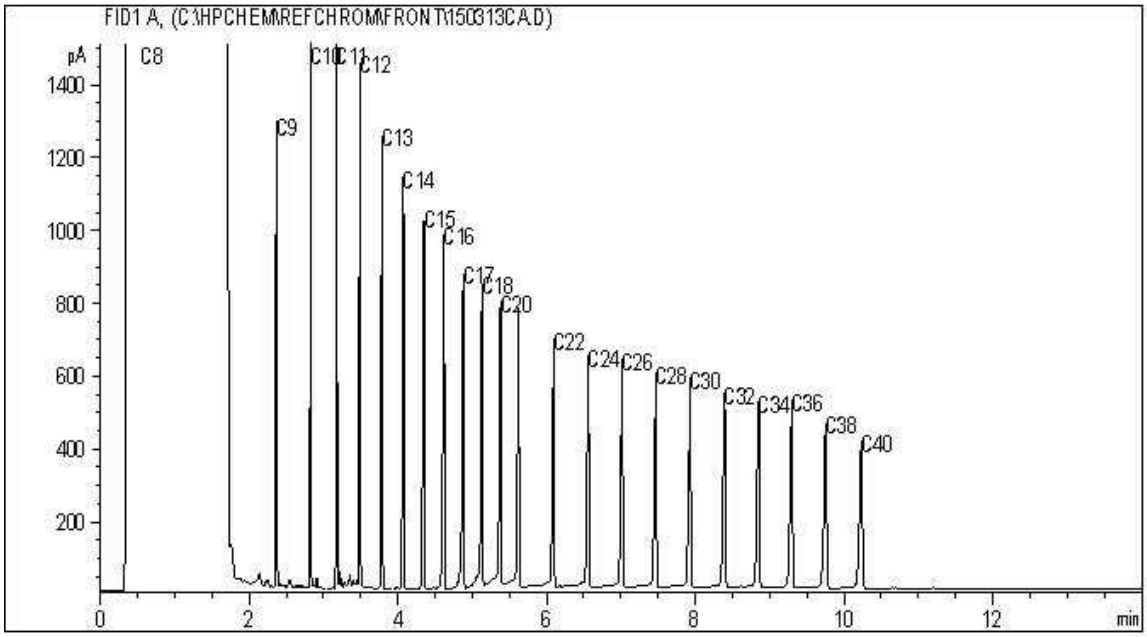


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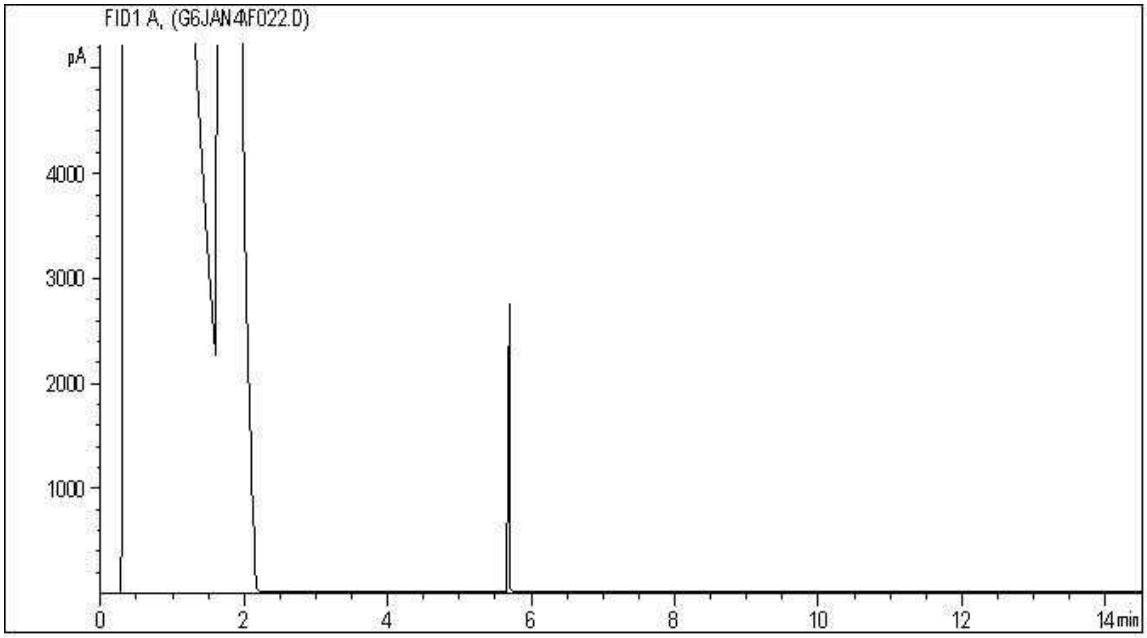


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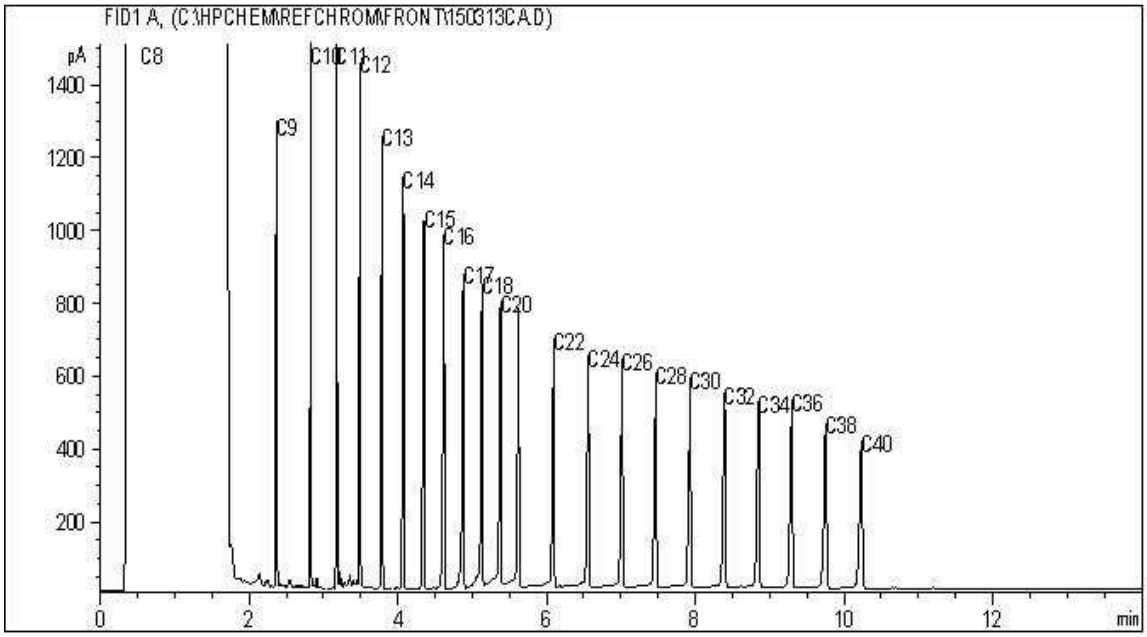


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