



# Phase II Environmental Site Assessment

480 Lucas Avenue  
R.M. of Rosser, MB

Prepared for:

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## EXECUTIVE SUMMARY

Pinchin Ltd. (Pinchin) was retained by Wayne Hekle of Rothwell Development Corporation (Client) to conduct a Phase II Environmental Site Assessment (ESA) of the property located at 480 Lucas Avenue in R.M. of Rosser, MB (hereafter referred to as the Site).

The Site is developed with a one-storey office building ("Site Building").

Pinchin was advised by the Client that the purpose of the Phase I ESA was to assess potential issues of environmental concern in relation to the potential financing of the Site.

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

- The retail fuel outlet (RFO) located approximately 30 m east of the Site which has been in operation since approximately 1960. Given that some remedial activities have been conducted, this property may represent a reduced risk to the Site; however, a Phase II ESA would be required to confirm or deny the presence of subsurface impacts at the Site.

Based on the above-mentioned finding, Pinchin recommended that a Phase II ESA be conducted at the Site in order to assess for the presence of environmental impacts.

The Phase II ESA was completed at the Site by Pinchin between September 9, 2014 and September 16, 2014, and consisted of the advancement of three boreholes, all of which were completed as groundwater monitoring wells.

Select "worst case" soil samples collected during the borehole drilling program were submitted for laboratory analysis of benzene, toluene, ethylbenzene and xylenes (BTEX) and petroleum hydrocarbons (PHCs) in the F1 through F4 fraction ranges (F1-F4). Groundwater samples collected from the newly installed monitoring wells were submitted for laboratory analysis of BTEX and PHCs (F1-F4).

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 September, 2014 and the CCME "*Canada-Wide Standards for Petroleum Hydrocarbons in Soil*", dated 2008 (hereafter collectively referred to as the "CCME Soil Guidelines").

The CCME does not provide groundwater criteria for non-potable groundwater conditions and Manitoba Conservation and Water Stewardship does not specify which guidelines to use for non-potable groundwater conditions. As such, groundwater quality was assessed based on the Ontario Ministry of Environment (MOE) guidelines.



- Reported concentrations in the soil and groundwater samples submitted for analysis of BTEX and PHCs (F1-F4) satisfied their respective CCME Soil Guidelines and MOE Groundwater Guidelines.

Based on the findings of this Phase II ESA, it is Pinchin's opinion that no further subsurface investigation is required for the Site in relation to the findings of the Phase I ESA.

*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 Wayne Hekle of Rothwell Development Corporation (Client) to conduct a Phase II Environmental Site Assessment (ESA) of the property located at 480 Lucas Avenue in R.M. of Rosser, 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 one-storey office building ("Site Building").

Pinchin was advised by the Client that the purpose of the Phase II ESA was to assess potential issues of environmental concern in relation to the potential financing 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 (*CSA Phase II ESA Standard*).

### 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, 480 Lucas Avenue, R.M. of Rosser, Manitoba*", dated December 31, 2012. The results of the Phase I ESA completed by Pinchin identified the following area which could result in potential subsurface impacts at the Site:

- The retail fuel outlet (RFO) located approximately 30 m east of the Site which has been in operation since approximately 1960. Given that some remedial activities have been conducted, this property may represent a reduced risk to the Site; however, a Phase II ESA would be required to confirm or deny the presence of subsurface impacts at the Site.

Based on the above-mentioned finding, it was Pinchin's recommendation that a Phase II ESA be conducted at the Site in order to assess the potential subsurface impacts at the Site.

### 1.2 Scope of Work

The scope of work completed by Pinchin, as outlined in the Pinchin proposal entitled "*Phase II Environmental Site Assessment Proposal, 480 Lucas Avenue, RM of Rosser, Manitoba*" submitted to the Client on August 20, 2014 included the following:

- Advancement of three boreholes following the clearance of underground services, all of which were to be instrumented with a monitoring well;
- Submission of select "worst case" soil samples for laboratory analysis of benzene, toluene, ethylbenzene and xylenes (BTEX) and petroleum hydrocarbons (PHCs) in the F1 to F4 fraction range (F1-F4);



- Collection of groundwater samples from each of the newly installed monitoring wells, following well development and purging, for laboratory analysis of BTEX and PHCs (F1-F4);
- Completion of depth to groundwater measurements for the newly installed monitoring wells;
- 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.

## 2.0 METHODOLOGY

The investigation methodology was conducted in general accordance with Manitoba Conservation and Water Stewardship's "Guideline for Environmental Site Investigations in Manitoba," dated 1998 (revised 2002) (*Manitoba Conservation and Water Stewardship Guideline*) and Pinchin's standard operating procedures (SOPs).

### 2.1 Borehole Investigation

Pinchin retained Maple Leaf Drilling to complete the borehole drilling program at the Site on September 9, 2014 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 4.26 meters below ground surface (mbgs) using a truck mounted solid stem auger drilling rig. Soil samples were collected at regular 0.76 meter (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 petroleum-derived vapour concentrations in soil headspace using a photoionization detector (PID) and a hydrocarbon surveyor operated in methane elimination mode (RKI Eagle).

The 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) and BH3 (MW3) to enable groundwater monitoring and sampling. The monitoring wells were constructed with 5.2 cm inner diameter (ID) flush-threaded Schedule 40 polyvinyl chloride (PVC) risers, followed by a length of 5.2 cm ID No. 10 slot PVC screen that intersected the suspected static groundwater level.

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 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 and Elevation Survey**

The water levels within the monitoring wells were measured on September 16, 2014 using an interface probe. The presence/absence of non-aqueous phase liquid (NAPL) was also assessed during groundwater monitoring using the interface probe and dedicated bailers.

### **2.4 Sampling and Laboratory Analysis**

#### *2.4.1 Soil*

One most apparent “worst case” soil sample, based on vapour concentrations as well as visual and/or olfactory considerations, recovered from each borehole was submitted for laboratory analysis of BTEX and PHCs (F1-F4).

The borehole locations are shown on Figure 2. Table 1 provides a summary of the soil samples submitted for laboratory analysis.

#### *2.4.2 Groundwater*

On September 9, 2014, all newly installed groundwater monitoring wells were developed by removing three to five well casing volumes, or were purged until dry, in accordance with Pinchin's SOPs.

On September 16, 2014 newly installed groundwater monitoring wells BH1 (MW1), BH2 (MW2) and BH3 (MW3) were purged prior to sampling by removing three to five well casing volumes, or were purged until dry, in accordance with Pinchin's SOPs. Upon groundwater recovery, groundwater samples were collected from these monitoring wells and submitted for laboratory analysis of BTEX and PHCs (F1-F4).

All monitoring well development, purging and sampling activities were conducted using dedicated disposable PVC bailers to draw groundwater to the surface.

The 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, MB 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 (i.e., interface probe and soil knife) were 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 and Water Stewardship Guideline* 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, an evaluation of relative percent difference (RPD) calculations for laboratory duplicate samples, and an evaluation of surrogate recoveries.

## 2.6 Site Condition Standards

Manitoba Conservation and Water Stewardship 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 and the CCME “*Canada-Wide Standards for Petroleum Hydrocarbons in Soil*” dated 2008. These guidelines are collectively referred to as the “CCME Soil Guidelines”.

For properties where groundwater is considered non-potable, Manitoba Conservation and Water Stewardship designates that groundwater quality be assessed based on Table 3 of the Ontario Ministry of the Environment (MOE) “*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*” dated April 15, 2011 (MOE Guidelines).

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. For example, if the site is covered with asphalt or concrete, access to the soil is limited and the human health guideline for soil ingestion is not applicable because there is no pathway for humans to come into contact with the soil if the cover is maintained. 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; and
- 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 loose gravel and grass and, therefore, the environmental health soil contact, human health ingestion and human health dermal contact pathways are considered to be applicable to 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 and all groundwater analytical results have been compared to the MOE Groundwater Guidelines for commercial land use and fine-grained soils, excluding the protection of potable groundwater, livestock watering and freshwater aquatic life.

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 borehole BH1 (MW1) consisted of fill material comprised of granular fill to a depth of approximately 0.46 meters below ground surface (mbgs). In borehole BH1 (MW1) and BH2 (MW2) there was no fill material and instead went straight into natural material consisting of brown damp clay of moderate plasticity for borehole BH1 (WM1) and black damp organic clay of moderate plasticity for borehole BH2 (MW2).

Native subsurface material underlying the fill material was observed to generally consist of brown, damp clay of moderate plasticity followed by brown moist silty clay that extended to the maximum borehole completion depth of 4.26 mbgs. Moist to wet soil conditions were generally observed between 0.45 and 4.26 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 0.61 mbgs at monitoring well BH1 (MW1) to 0.91 mbgs at monitoring well BH3 (MW3) measured on September 16, 2014.

The east branch of Colony Creek is located approximately 350 m west of the Site. Colony Creek flows southeast and discharges into the Assiniboine River, located approximately 6.7 kilometers (km) south of the Site. The Red River is located approximately 8.5 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 northeast based on the findings of the Phase I ESA completed by Pinchin.

### **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<sub>v</sub>) to a maximum of 65 ppm<sub>v</sub> in soil sample BH2 S3 collected at a depth of 2.13 to 2.29 mbgs in borehole BH2 (WM2).

### **3.3 Field Observations**

No odours or staining were observed in the soil samples collected during the borehole drilling program.

### **3.4 Analytical**

#### *3.4.1 Soil*

As indicated in Table 3, reported concentrations of BTEX and PHCs (F1-F4) in the soil samples submitted for analysis met 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 Table 4, reported concentrations in the groundwater samples submitted for analysis of BTEX and PHCs (F1-F4) met the MOE Groundwater Guidelines.

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 Drilling to advance three boreholes at the Site on September 9, 2014. The boreholes were advanced to a maximum depth of 4.26 mbgs using a truck mounted solid stem auger drilling rig. All of the boreholes were instrumented with monitoring wells to enable groundwater monitoring and sampling;
- The soil stratigraphy at borehole BH1 (MW1) consisted of gravel overlying granular fill material to a depth of approximately 0.46 mbgs overlying native soil comprised of brown damp clay of moderate plasticity followed by brown moist silty clay that extended to the maximum borehole completion depth of 4.26 mbgs. In borehole BH1 (MW1) and BH2 (MW2) there was no fill material and instead went straight into natural material consisting of brown damp clay of moderate plasticity for borehole BH1 (MW1) and black damp organic clay of moderate plasticity for borehole BH2 (MW2). The soil was generally observed to be moist to wet between 0.45 and 4.26 mbgs;
- Groundwater levels at the Site measured on September 16, 2014 varied between 0.61 mbgs at BH1 (MW1) and 0.91 mbgs at BH3 (MW3). Inferred groundwater flow is expected to be towards the northeast based on the findings of the Phase I ESA completed by Pinchin;
- Based on Site specific information, the soil quality was assessed based on the CCME Guidelines for commercial land use, fine-textured soils excluding the protection of potable water, livestock watering and aquatic life;
- Based on Site specific information, the groundwater quality was assessed based on the MOE Groundwater Guidelines for commercial land use, fine-textured soils excluding the protection of potable water, livestock watering and aquatic life;
- One “worst case” soil sample based on the results of field screening was submitted for laboratory analysis of BTEX and PHCs (F1-F4);
- Groundwater samples were collected from monitoring wells BH1 (MW1), BH2 (MW2) and BH3 (MW3) installed by Pinchin on September 9, 2014 and sampled on September 16, 2014 and were submitted for laboratory analysis of BTEX and PHCs (F1-F4);
- Reported concentrations in the soil samples submitted for analysis of BTEX and PHCs (F1-F4) satisfied their respective CCME Soil Guidelines; and
- Reported concentrations in the groundwater samples submitted for analysis BTEX and PHCs (F1-F4) satisfied their respective MOE Groundwater Guidelines.



Based on the findings of this Phase II ESA, it is Pinchin's opinion that no further subsurface investigation is required for the Site in relation to the findings of the Phase I ESA.

## 5.0 DISCLAIMER

This Phase II ESA was performed for Rothwell Development Corporation (Client) in order to investigate potential environmental impacts at 480 Lucas Avenue, R.M of Rosser, MB (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.



The liability of Pinchin or our officers, directors, shareholders or staff will be limited to the lesser of the fees paid or actual damages incurred by the Client. 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 Pinchin date upon which the claim is discovered (Claim Period), to commence legal proceedings against 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.

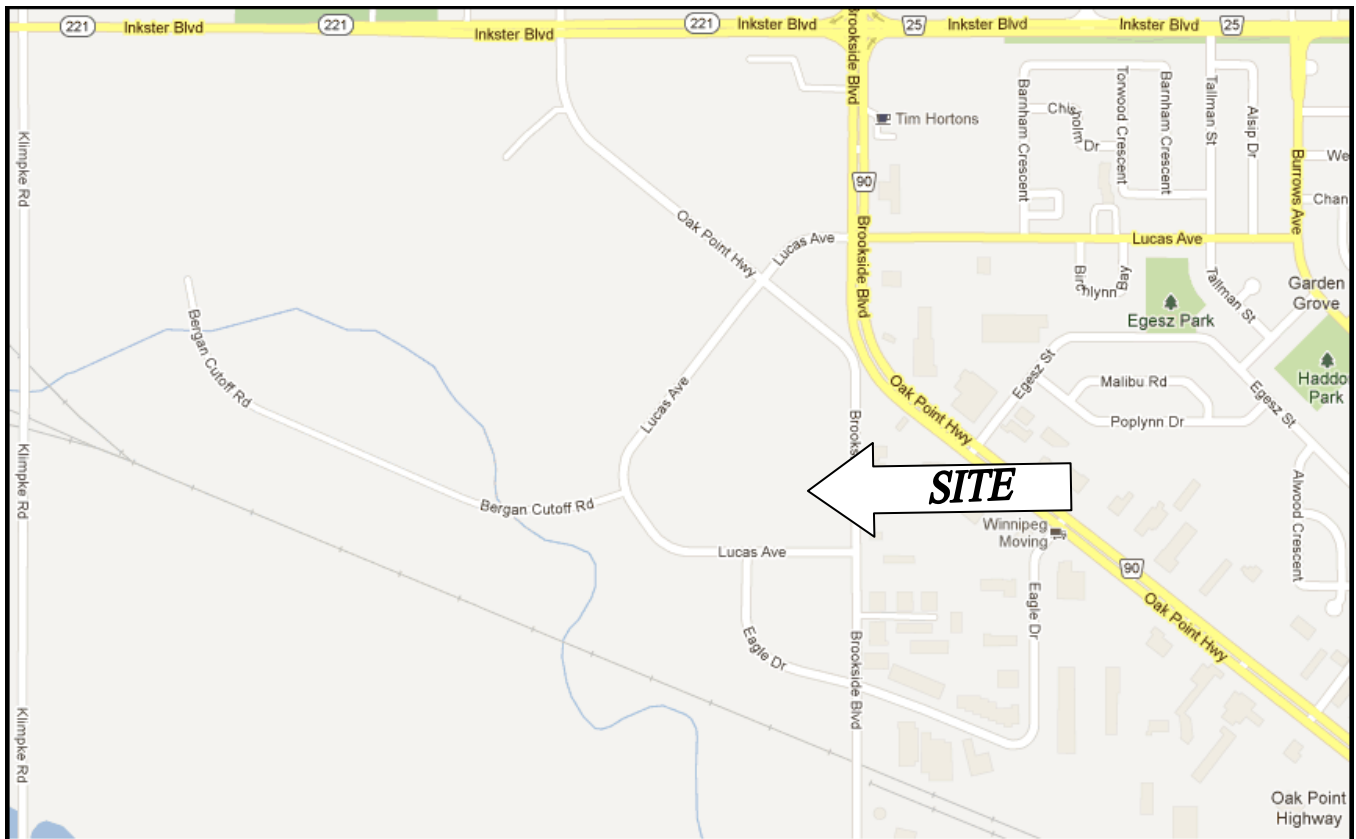
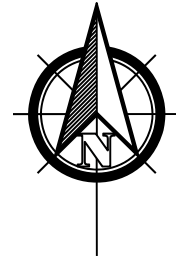
Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect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

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Template: Master Report for Phase II ESA - Stage 2 PSI, EDR, September 17, 2014


**APPENDIX I**  
**Figures**

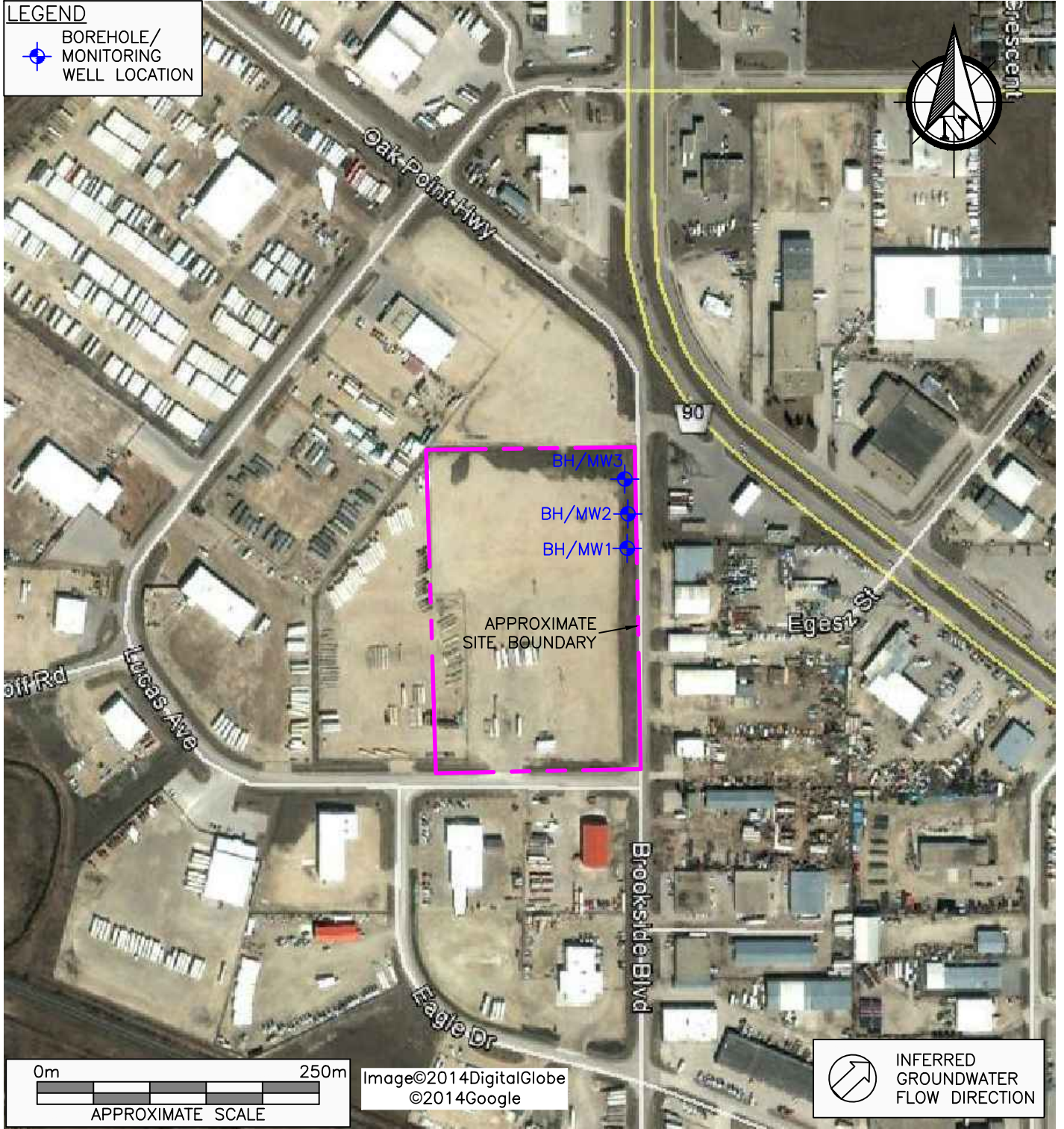




PROJECT NAME			
<b>PHASE II ENVIRONMENTAL SITE ASSESSMENT</b>			
CLIENT NAME			
<b>ROTHWELL DEVELOPMENT CORPORATION</b>			
PROJECT LOCATION			
<b>480 LUCAS AVENUE, R.M. OF ROSSER, MANITOBA</b>			
DRAWING NAME			FIGURE NO.
<b>KEY MAP</b>			<b>1</b>
SCALE	PROJECT NO.	DATE	
<b>NTS</b>	<b>80038.001</b>	<b>SEPT. 2014</b>	

**LEGEND**

 BOREHOLE/  
MONITORING  
WELL LOCATION



PROJECT NAME			
PHASE II ENVIRONMENTAL SITE ASSESSMENT			
CLIENT NAME			
ROTHWELL DEVELOPMENT CORPORATION			
PROJECT LOCATION			
480 LUCAS AVENUE, R.M. OF ROSSER, MANITOBA			
FIGURE NAME			FIGURE NO.
BOREHOLE/MONITORING WELL LOCATION PLAN			2
APPROXIMATE SCALE	PROJECT NO.	DATE	
AS SHOWN	80038.001	SEPT. 2014	

**APPENDIX II**  
**Borehole Logs**



**Project No:** 80038.001

**Borehole: BH1 (MW1)**

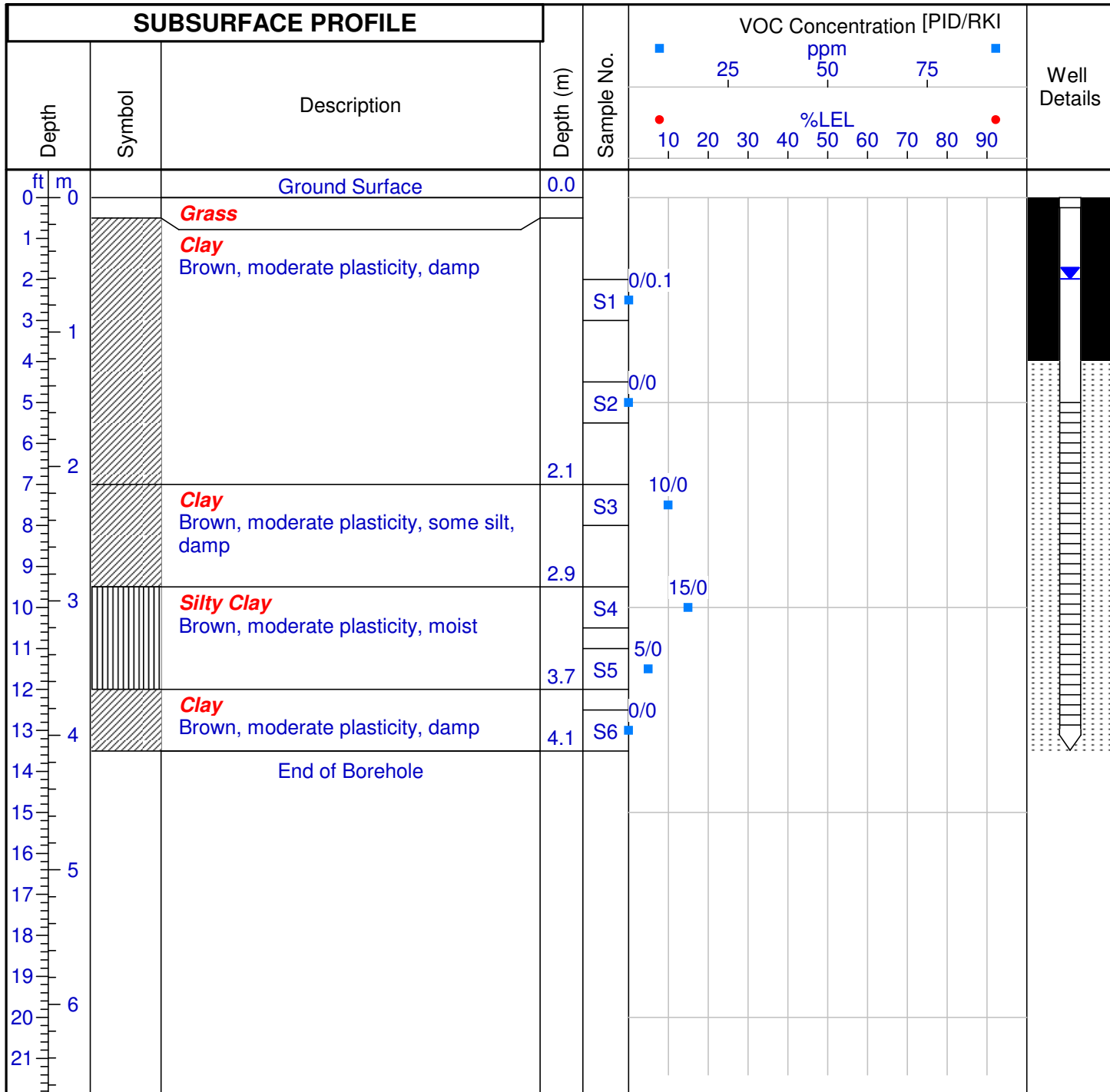
**Project:** Phase II Environmental Site Assessment

**Client:** Rothwell Development Corporation

**Logged By:** RS

**Location:** 480 Lucas Avenue, R.M of Rosser, MB

**Entered By:** RS



Drill Method: Solid Stem Auger

Datum: Ground Level

Drilled By: Maple Leaf Drilling

Checked by: GEE

Drill Date: September 9, 2014

Sheet: 1 of 1



**Project No:** 80038.001

## Borehole: BH2 (MW2)

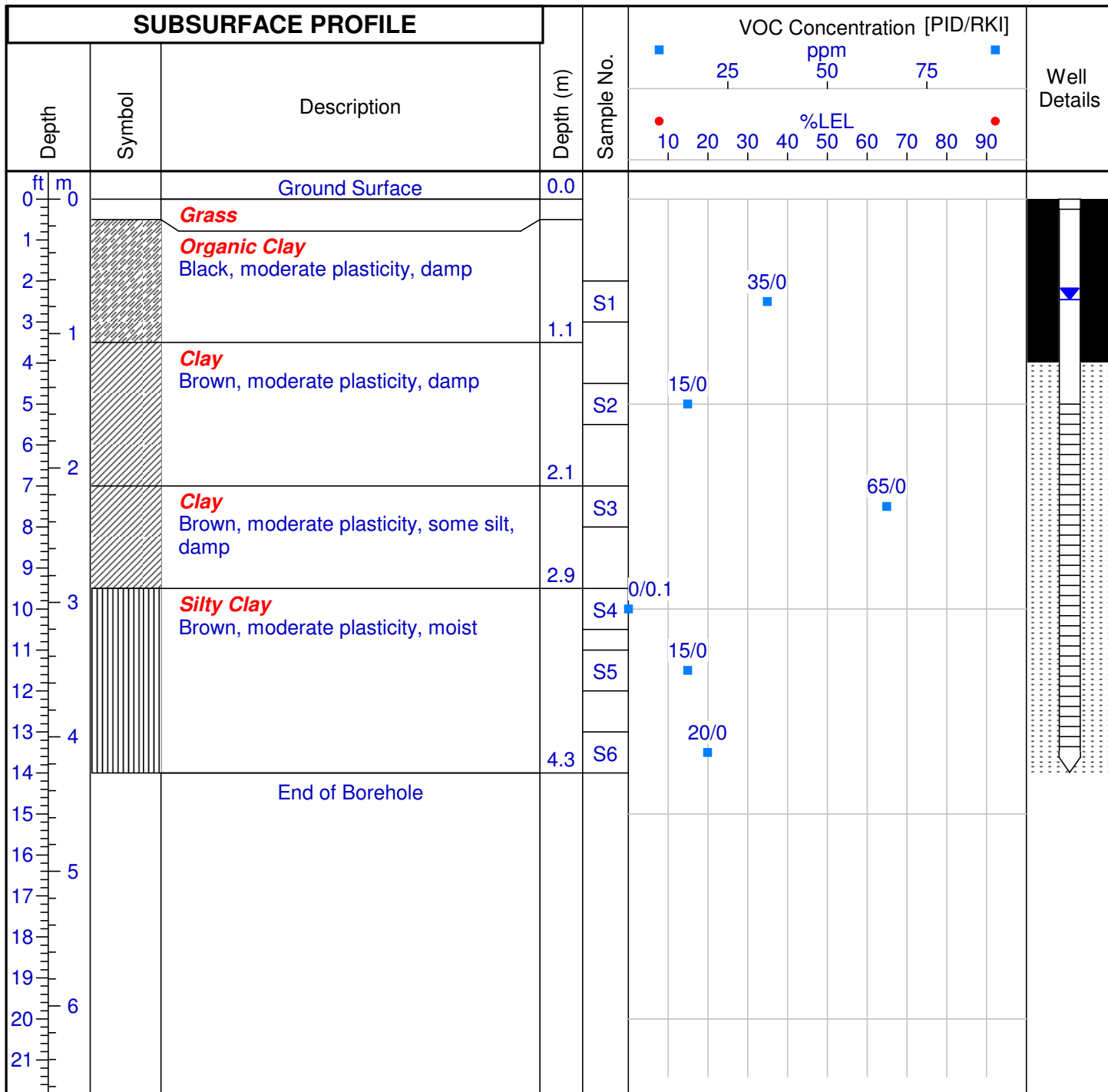
**Project:** Phase II Environmental Site Assessment

**Client:** Rothwell Development Corporation

**Logged By:** RS

**Location:** 480 Lucas Avenue, R.M of Rosser, MB

**Entered By:** RS



Drill Method: Solid Stem Auger

Datum: Ground Level

Drilled By: Maple Leaf Drilling

Checked by: GEE

Drill Date: September 9, 2014

Sheet: 1 of 1





Project No: 80038.001

## Borehole: BH3 (MW3)

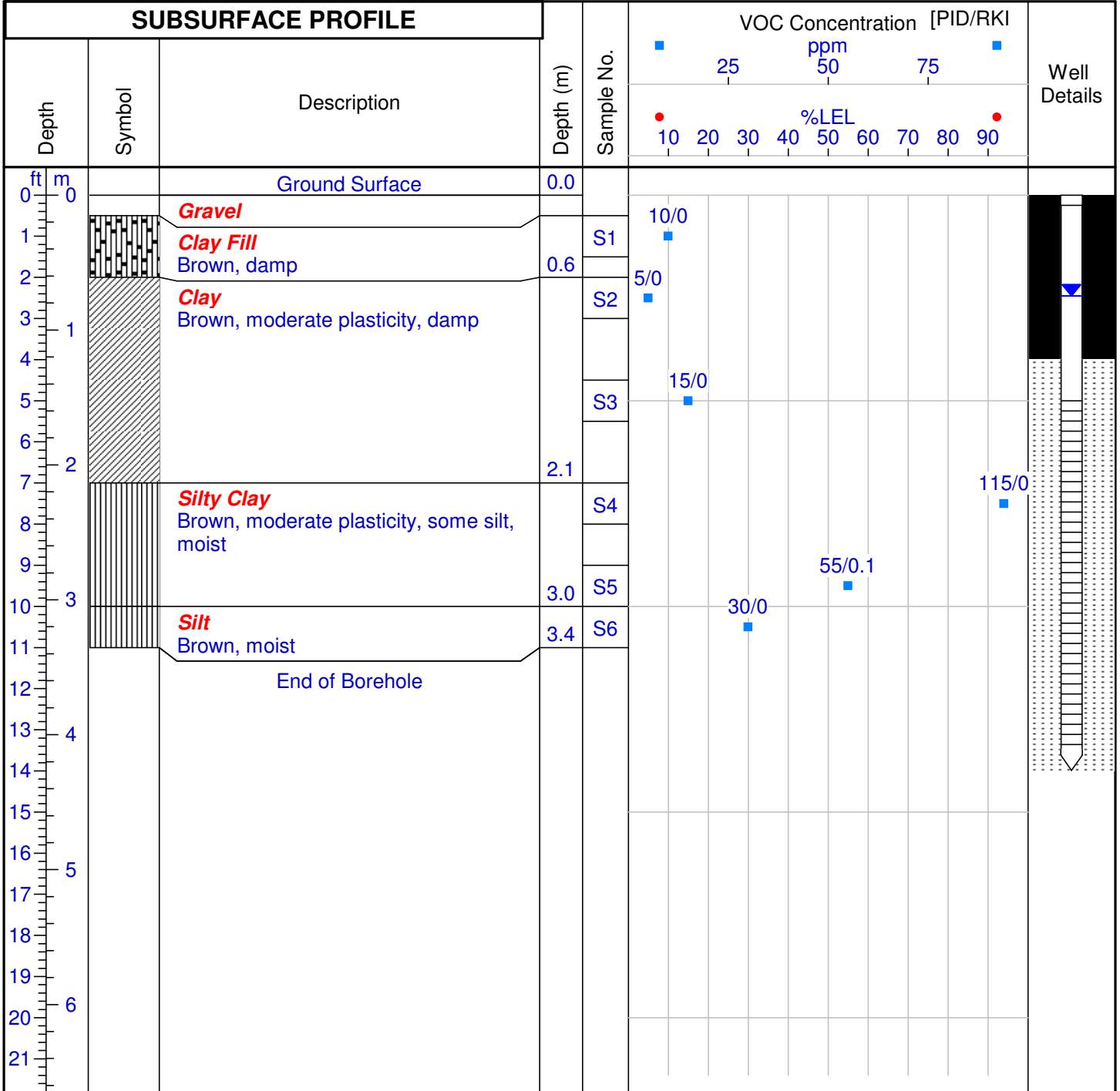
Project: Phase II Environmental Site Assessment

Client: Rothwell Development Corporation

Logged By: RS

Location: 480 Lucas Avenue, R.M of Rosser, MB

Entered By: RS



Drill Method: Solid Stem Auger

Datum: Ground Level

Drilled By: Maple Leaf Drilling

Checked by: GEE

Drill Date: September 9, 2014

Sheet: 1 of 1

**APPENDIX III**  
**Summary Tables**

**Table 1**  
**Samples Submitted for Laboratory Analysis**  
**Phase II Environmental Site Assessment**  
**480 Lucas Avenue**  
**R.M. of Rosser, MB**

<b>Samples</b>			<b>Parameters</b>											<b>Rationale</b>		
<b>Sample Location</b>	<b>Sample Identifier</b>	<b>Sample Depth (mbgs)</b>	<b>SOIL SAMPLES</b>							<b>GROUNDWATER SAMPLES</b>						
			PHCs (F1 - F4)	BTEX	Metals	VOCs	PAHs	Grain Size Analysis	TCLP VOCs	TCLP Metals	PHCs	BTEX	VOCs	PAHs	Metals	
BH1	BH1 S4	2.9	●	●												Assess soil conditions in relation to historic off-Site RFO.
	MW1	-									●	●				Assess groundwater conditions in relation to historic off-site RFO.
BH2	BH2 S3	2.13	●	●												Assess soil conditions in relation to historic off-Site RFO.
	MW2	-									●	●				Assess groundwater conditions in relation to historic off-site RFO.
BH3	BH3 S4	2.13	●	●												Assess soil conditions in relation to historic off-Site RFO.
	MW3	-									●	●				Assess groundwater conditions in relation to historic off-site RFO.

Notes:

- mbgs Metres Below Ground Surface
- PHCs Petroleum Hydrocarbons
- BTEX Benzene, Toluene, Ethylbenzene, and Xylenes
- PAH Polycyclic Aromatic Hydrocarbons
- VOCs Volatile Organic Compounds
- TCLP Toxicity Characteristic Leaching Procedure
- RFO Retail Fuel Outlet



**Table 2**  
**Groundwater Level Data**  
**Phase II Environmental Site Assessment**  
**480 Lucas Avenue**  
**R.M. of Rosser, MB**

<b>Well Number</b>	<b>Date (dd/mm/yyyy)</b>	<b>NAPL Level Measurement from TOC (m)</b>	<b>Water Level Measurement from TOC (m)</b>	<b>Water Level Measurement from Ground (mbgs)</b>	<b>Product Thickness (m)</b>
MW1	16/09/2014	ND	0.51	0.61	ND
MW2	16/09/2014	ND	0.71	0.76	ND
MW3	16/09/2014	ND	0.83	0.91	ND

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

<p align="center"><b>Table 3</b>  <b>Petroleum Hydrocarbon and BTEX Analysis for Soil</b>  <b>Phase II Environmental Site Assessment</b>  <b>480 Lucas Avenue</b>  <b>R.M. of Rosser, MB</b></p>						
Parameter		Sample Identification			CCME Guidelines <sup>a</sup>	
		BH1 S4	BH2 S3	BH3 S4	Surface (< 1.5 mbgs)	Subsoil (> 1.5 mbgs)
		2.9 mbgs	2.13 mbgs	2.13 mbgs		
		Fine	Fine	Fine		
<b>BTEX</b>	Benzene	<0.0050	<0.0050	<0.0050	2.88 <sup>b</sup>	2.9
	Toluene	<0.020	<0.020	<0.020	330 <sup>b</sup>	660
	Ethylbenzene	<0.010	<0.010	<0.010	430 <sup>b</sup>	860
	Xylenes	<0.040	<0.040	<0.040	230 <sup>b</sup>	460
<b>PHCs</b>	F1 (C6-C10)	<10	<10	<10	320 <sup>c</sup>	800
	F2 (C10-C16)	<20	<20	<20	260 <sup>c</sup>	1,000
	F3 (C16-C34)	<20	<20	<20	2,500 <sup>c</sup>	5,000
	F4 (C34-C50)	<20	<20	<20	6,600 <sup>c</sup>	10,000

**Note:**

- All concentrations in milligrams 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 S4 = sample was collected from Borehole 1, Sample Number 4
- 2.9 mbgs = sample was collected at 2.9 meters below ground surface
- CCME = Canadian Council of the Ministers of the Environment
- <sup>a</sup> Referenced from the CCME Canadian Environmental Quality Guidelines, Accessed On-Line in September, 2014
- 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 4**  
**Petroleum Hydrocarbon and BTEX Analysis for Groundwater**  
**Phase II Environmental Site Assessment**  
**480 Lucas Avenue**  
**R.M. of Rosser, MB**

Parameter	Sample Identification			MOE Guidelines <sup>a</sup>	
	MW1	MW2	MW3		
<b>BTEX</b>	Benzene	<0.4	<0.4	<0.4	44 <sup>b</sup> 430 <sup>c</sup>
	Toluene	<0.4	<0.4	<0.4	18,000
	Ethylbenzene	<0.4	<0.4	<0.4	2,300
	Xylenes	<0.8	<0.8	<0.8	4,200
<b>PHCs</b>	F1 (C6-C10)	<300	<300	<300	750
	F2 (C10-C16)	<150	<150	<150	150
	F3 (C16-C34)	<150	<150	<150	500
	F4 (C34-C50)	<150	<150	<150	500

**Note:**

- All concentrations in micrograms per litre (µg/L) unless otherwise noted
- NA = Not Analyzed
- 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 1
- <sup>a</sup> Referenced from the Ontario Ministry of the Environment Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
- <sup>b</sup> Value listed represents the most stringent criteria for all property types, coarse-grained soils excluding protection of potable water and aquatic life (Table 3)
- <sup>c</sup> Value listed represents the most stringent criteria for all property types, fine-grained soils excluding protection of potable water and aquatic life (Table 3)
- Concentrations in **BOLD** print indicates concentration exceeds referenced guideline

**APPENDIX IV**  
**Laboratory Certificates of Analysis**

Your Project #: 80038.001  
Your C.O.C. #: N000734

**Attention:SEAN MULVEY**

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

**Report Date: 2014/09/16**  
Report #: R1643426  
Version: 1

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B480386**

**Received: 2014/09/11, 12:00**

Sample Matrix: Soil  
# Samples Received: 3

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
BTEX/F1 by HS GC-MS/FID (MeOH extract) (1)	3	2014/09/12	2014/09/12	WINSOP-00054 WINSOP-00055	EPA8260C/CCME PHCCWS
CCME Hydrocarbons (F2-F4 in soil) (2)	3	2014/09/12	2014/09/15	WINSOP-00056	CCME PHC-CWS
Moisture	3	N/A	2014/09/15	WIN SOP-00060	Carter Method 51.2

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

- (1) 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.
- (2) 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.

**Encryption Key**

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

Janelle Kochan, B.Sc., Project Manager

Email: JKochan@maxxam.ca

Phone# (204)772-7276 Ext:2209

=====

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 #: B480386  
Report Date: 2014/09/16

PINCHIN ENVIRONMENTAL LTD  
Client Project #: 80038.001

**RESULTS OF CHEMICAL ANALYSES OF SOIL**

Maxxam ID		KO4500	KO4501	KO4502		
Sampling Date		2014/09/09 10:00	2014/09/09 11:00	2014/09/09 12:00		
COC Number		N000734	N000734	N000734		
	Units	BH1 S4	BH2 S3	BH3 S4	RDL	QC Batch
<b>Physical Properties</b>						
Moisture	%	9.2	9.6	11	0.3	7634941
RDL = Reportable Detection Limit						

Maxxam Job #: B480386  
Report Date: 2014/09/16

PINCHIN ENVIRONMENTAL LTD  
Client Project #: 80038.001

**PETROLEUM HYDROCARBONS (CCME)**

Maxxam ID		KO4500	KO4501	KO4502		
Sampling Date		2014/09/09 10:00	2014/09/09 11:00	2014/09/09 12:00		
COC Number		N000734	N000734	N000734		
	Units	BH1 S4	BH2 S3	BH3 S4	RDL	QC Batch
<b>Ext. Pet. Hydrocarbon</b>						
F2 (C10-C16 Hydrocarbons)	mg/kg	<20	<20	<20	20	7634940
F3 (C16-C34 Hydrocarbons)	mg/kg	<20	<20	<20	20	7634940
F4 (C34-C50 Hydrocarbons)	mg/kg	<20	<20	<20	20	7634940
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	N/A	7634940
<b>Surrogate Recovery (%)</b>						
O-TERPHENYL (sur.)	%	87	88	82		7634940
RDL = Reportable Detection Limit						
N/A = Not Applicable						

Maxxam Job #: B480386  
Report Date: 2014/09/16

PINCHIN ENVIRONMENTAL LTD  
Client Project #: 80038.001

**VOLATILE ORGANICS BY GC-MS (SOIL)**

Maxxam ID		KO4500	KO4501	KO4502		
Sampling Date		2014/09/09 10:00	2014/09/09 11:00	2014/09/09 12:00		
COC Number		N000734	N000734	N000734		
	Units	BH1 S4	BH2 S3	BH3 S4	RDL	QC Batch
<b>Volatiles</b>						
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	0.0050	7634939
Toluene	mg/kg	<0.020	<0.020	<0.020	0.020	7634939
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	0.010	7634939
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	0.040	7634939
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	0.040	7634939
o-Xylene	mg/kg	<0.020	<0.020	<0.020	0.020	7634939
Methyl-tert-butylether (MTBE)	mg/kg	<0.10	<0.10	<0.10	0.10	7634939
F1 (C6-C10) - BTEX	mg/kg	<10	<10	<10	10	7634939
(C6-C10)	mg/kg	<10	<10	<10	10	7634939
<b>Surrogate Recovery (%)</b>						
4-Bromofluorobenzene (sur.)	%	111	110	110		7634939
D10-ETHYLBENZENE (sur.)	%	126	125	129		7634939
D4-1,2-Dichloroethane (sur.)	%	118	121	121		7634939
D8-TOLUENE (sur.)	%	96	96	96		7634939
RDL = Reportable Detection Limit						



Maxxam Job #: B480386  
Report Date: 2014/09/16

PINCHIN ENVIRONMENTAL LTD  
Client Project #: 80038.001

### GENERAL COMMENTS

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

Maxxam Job #: B480386  
Report Date: 2014/09/16

**QUALITY ASSURANCE REPORT**

PINCHIN ENVIRONMENTAL LTD  
Client Project #: 80038.001

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7634939	4-Bromofluorobenzene (sur.)	2014/09/12	114	60 - 140	114	60 - 140	112	%		
7634939	D10-ETHYLBENZENE (sur.)	2014/09/12	129	50 - 130	123	50 - 130	122	%		
7634939	D4-1,2-Dichloroethane (sur.)	2014/09/12	117	60 - 140	115	60 - 140	117	%		
7634939	D8-TOLUENE (sur.)	2014/09/12	95	60 - 140	95	60 - 140	96	%		
7634940	O-TERPHENYL (sur.)	2014/09/15	84	50 - 130	97	50 - 130	92	%		
7634939	(C6-C10)	2014/09/12	102	60 - 140	131	60 - 140	<10	mg/kg	NC	50
7634939	Benzene	2014/09/12	98	60 - 140	91	60 - 140	<0.0050	mg/kg	NC	50
7634939	Ethylbenzene	2014/09/12	99	60 - 140	91	60 - 140	<0.010	mg/kg	NC	50
7634939	F1 (C6-C10) - BTEX	2014/09/12					<10	mg/kg	NC	50
7634939	m & p-Xylene	2014/09/12	94	60 - 140	85	60 - 140	<0.040	mg/kg	NC	50
7634939	Methyl-tert-butylether (MTBE)	2014/09/12	128	60 - 140	117	60 - 140	<0.10	mg/kg		
7634939	o-Xylene	2014/09/12	100	60 - 140	93	60 - 140	<0.020	mg/kg	NC	50
7634939	Toluene	2014/09/12	93	60 - 140	86	60 - 140	<0.020	mg/kg	NC	50
7634939	Xylenes (Total)	2014/09/12					<0.040	mg/kg	NC	50
7634940	F2 (C10-C16 Hydrocarbons)	2014/09/15	94	50 - 130	111	70 - 130	<20	mg/kg	NC	50
7634940	F3 (C16-C34 Hydrocarbons)	2014/09/15	96	50 - 130	112	70 - 130	<20	mg/kg	NC	50
7634940	F4 (C34-C50 Hydrocarbons)	2014/09/15	91	50 - 130	107	70 - 130	<20	mg/kg	NC	50
7634941	Moisture	2014/09/15					<0.3	%	3.7	20

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 Job #: B480386  
Report Date: 2014/09/16

PINCHIN ENVIRONMENTAL LTD  
Client Project #: 80038.001

### 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

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



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

**CHAIN OF CUSTODY RECORD**

Page 1 of 1

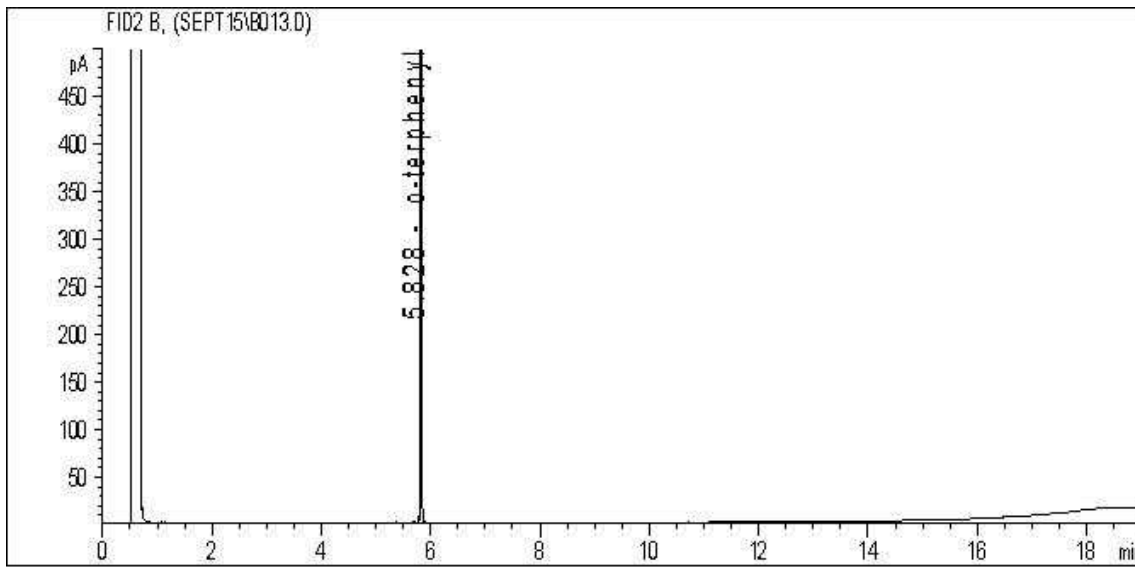
<b>INVOICE INFORMATION</b>		<b>REPORT INFORMATION (if different from invoice)</b>		<b>PROJECT INFORMATION</b>		<b>MAXXAM JOB NUMBER</b>	
Company Name: <u>PINCHU</u>		Company Name: _____		Quotation #: _____		B480386	
Contact Name: <u>SEAN MULVEY</u>		Contact Name: <u>rslater@pinchu.com</u>		P.O. #: _____		CHAIN OF CUSTODY #	
Address: <u>54 TERRON PL</u> <u>WINNIPEG</u>		Address: _____		Project #: <u>80038.001</u>		N 000734	
Phone: <u>452 0983</u> Fax: _____		Phone: _____ Fax: _____		Project Name: _____			
Email: <u>smulvey@pinchu.com</u>		Email: _____		Location: _____			
				Sampled By: _____			

<b>REGULATORY REQUIREMENTS SERVICE REQUESTED:</b>					<b>ANALYSIS REQUESTED (Please be specific)</b>										<b>TURNAROUND TIME (TAT) REQUIRED</b>							
<input checked="" type="checkbox"/> CCME <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> Other: _____					Drinking Water? (Y / N)										<b>PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS.</b> Regular (Standard) TAT: <input checked="" type="checkbox"/> 5 to 7 Working Days Rush TAT: <input type="checkbox"/> 1 day <input type="checkbox"/> 2 days <input type="checkbox"/> 3 days DATE Required: _____ TIME Required: _____ TATs for certain tests are > 5 days. Please contact your Project Manager for details							
Special Instructions:					Coliforms: Total <input type="checkbox"/> Fecal <input type="checkbox"/> E. coli <input type="checkbox"/> MF <input type="checkbox"/> MPN <input type="checkbox"/> QT <input type="checkbox"/> Dissolved Metals: Field Filtered? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Field Acidified? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Total Metal: Field Acidified? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> BTEX <input type="checkbox"/> BTEX / F1 <input type="checkbox"/> F2 - F4 <input type="checkbox"/> PCB <input type="checkbox"/> Biochemical Oxygen Demand <input type="checkbox"/>										<b>HOLD - DO NOT ANALYZE</b> # of Cont. COMMENTS / TAT COMMENTS							
<b>SAMPLES MUST BE KEPT COOL (&lt;10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM.</b>																						
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	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	K04500 BH1 S4	9/9/2014	10:00	Soil											X	X					2	
2	4501 BH2 S3		11:00												X	X						
3	4502 BH3 S4		12:00												X	X						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

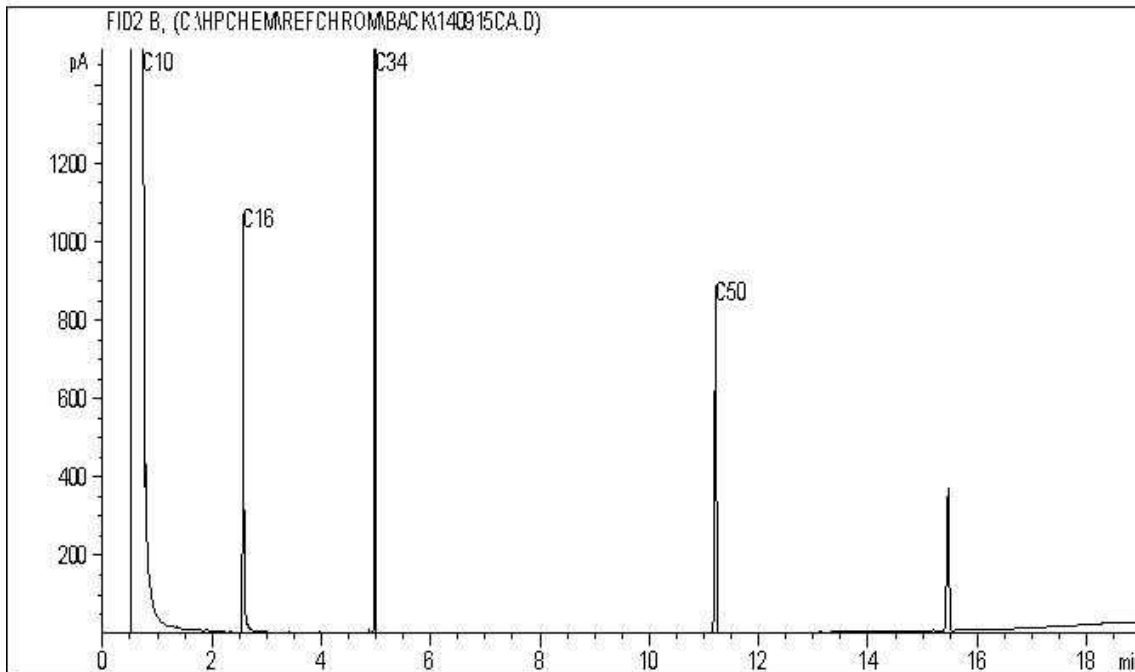
RELINQUISHED BY (Signature/Print)		RECEIVED BY (Signature/Print)		Date	Time	#JARS USED AND NOT SUBMITTED	Laboratory Use Only	
SEAN MULVEY <i>[Signature]</i>		Jennifer <i>[Signature]</i>		2014/09/12	1200		Temperature (°C) on Receipt 6.2, 4.8, 5.2	

**\*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



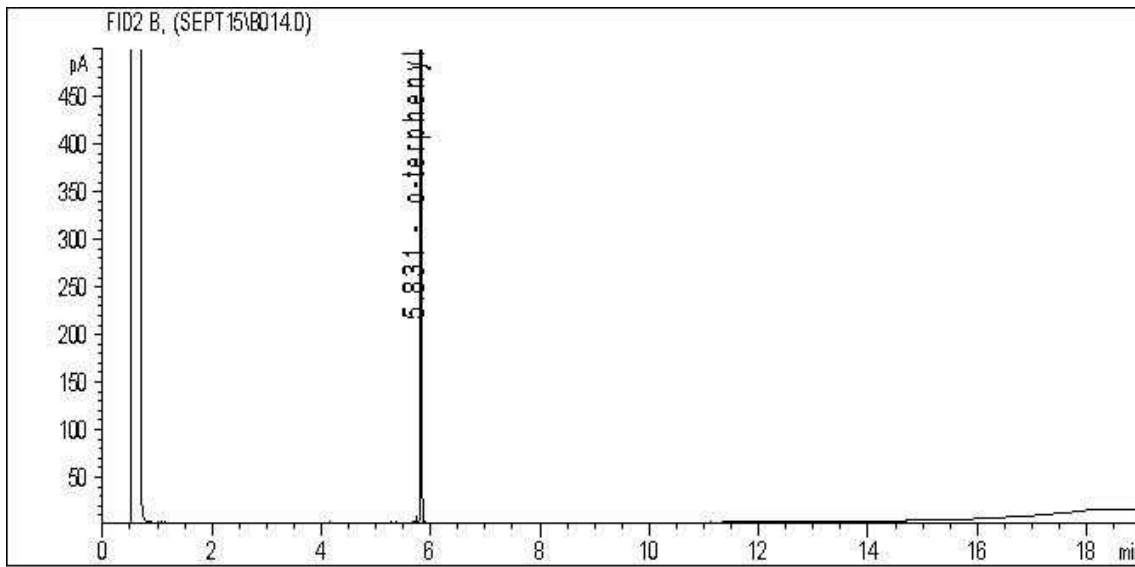
Carbon Range Distribution - Reference Chromatogram



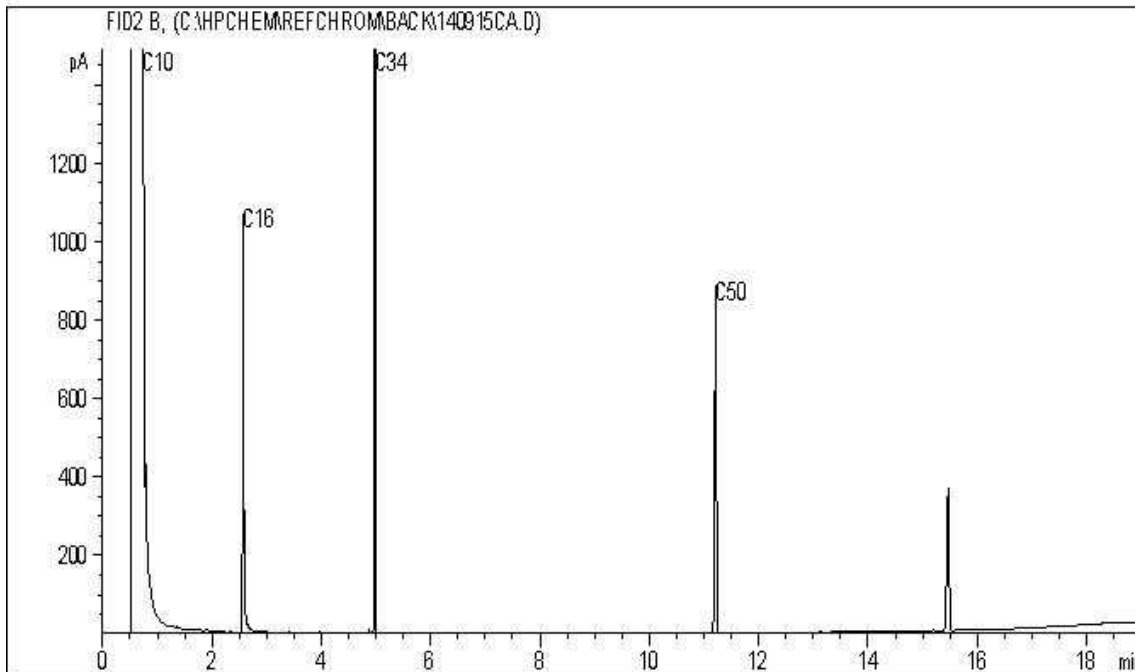
TYPICAL PRODUCT CARBON NUMBER RANGES

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



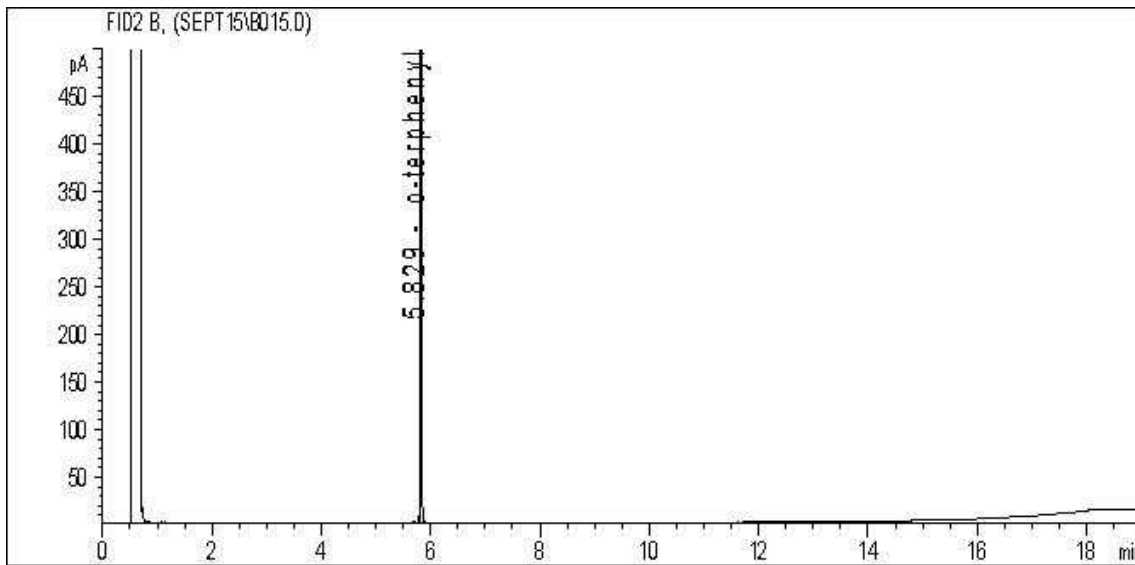
Carbon Range Distribution - Reference Chromatogram



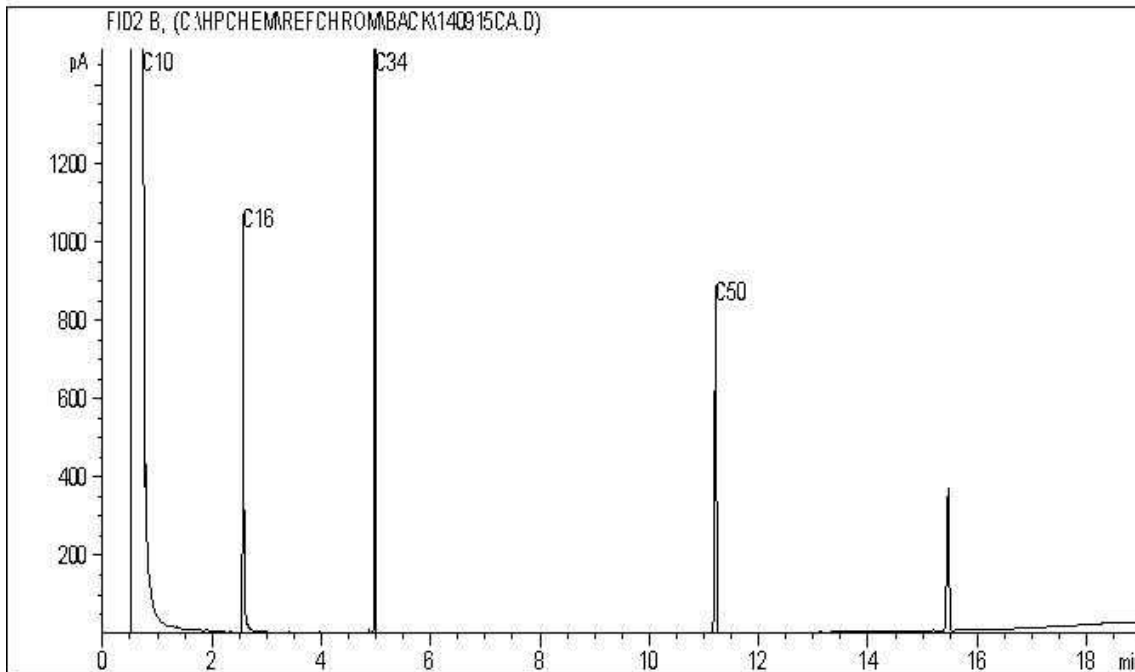
TYPICAL PRODUCT CARBON NUMBER RANGES

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



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

Your Project #: 80038.001  
Your C.O.C. #: N000722

**Attention:ROBERT SLATER**

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

**Report Date: 2014/09/24**

Report #: R1648406

Version: 1

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B482541**

**Received: 2014/09/17, 14:30**

Sample Matrix: Water  
# Samples Received: 3

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
BTEX/F1 in Water by HS GC/MS	3	N/A	2014/09/22	WINSOP-00054 WINSOP-00055	EPA8260C/CCME PHCCWS
CCME Hydrocarbons (F2-F4 in water)	3	2014/09/19	2014/09/19	WINSOP-00056	CCME PHC-CWS

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

**Encryption Key**

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

Janelle Kochan, B.Sc., Project Manager

Email: JKochan@maxxam.ca

Phone# (204)772-7276 Ext:2209

=====  
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Maxxam Job #: B482541  
Report Date: 2014/09/24

PINCHIN ENVIRONMENTAL LTD  
Client Project #: 80038.001  
Sampler Initials: RS

**PETROLEUM HYDROCARBONS (CCME)**

Maxxam ID		KP8032	KP8033	KP8034		
Sampling Date		2014/09/16 10:30	2014/09/16 10:45	2014/09/16 11:00		
COC Number		N000722	N000722	N000722		
	Units	MW1	MW2	MW3	RDL	QC Batch
<b>Ext. Pet. Hydrocarbon</b>						
F2 (C10-C16 Hydrocarbons)	mg/L	<0.15	<0.15	<0.15	0.15	7644702
F3 (C16-C34 Hydrocarbons)	mg/L	<0.15	<0.15	<0.15	0.15	7644702
F4 (C34-C50 Hydrocarbons)	mg/L	<0.15	<0.15	<0.15	0.15	7644702
Reached Baseline at C50	mg/L	Yes	Yes	Yes	1.0	7644702
<b>Surrogate Recovery (%)</b>						
O-TERPHENYL (sur.)	%	98	105	105		7644702
RDL = Reportable Detection Limit						

Maxxam Job #: B482541  
Report Date: 2014/09/24

PINCHIN ENVIRONMENTAL LTD  
Client Project #: 80038.001  
Sampler Initials: RS

**VOLATILE ORGANICS BY GC-MS (WATER)**

Maxxam ID		KP8032	KP8033	KP8034		
Sampling Date		2014/09/16 10:30	2014/09/16 10:45	2014/09/16 11:00		
COC Number		N000722	N000722	N000722		
	Units	MW1	MW2	MW3	RDL	QC Batch
<b>Volatiles</b>						
Benzene	ug/L	<0.4	<0.4	<0.4	0.4	7647930
Toluene	ug/L	<0.4	<0.4	<0.4	0.4	7647930
Ethylbenzene	ug/L	<0.4	<0.4	<0.4	0.4	7647930
o-Xylene	ug/L	<0.4	<0.4	<0.4	0.4	7647930
m & p-Xylene	ug/L	<0.8	<0.8	<0.8	0.8	7647930
Xylenes (Total)	ug/L	<0.8	<0.8	<0.8	0.8	7647930
Methyl-tert-butylether (MTBE)	ug/L	<4	<4	<4	4	7647930
F1 (C6-C10) - BTEX	ug/L	<300	<300	<300	300	7647930
(C6-C10)	ug/L	<300	<300	<300	300	7647930
<b>Surrogate Recovery (%)</b>						
4-Bromofluorobenzene (sur.)	%	104	90	101		7647930
D4-1,2-Dichloroethane (sur.)	%	102	98	104		7647930
D8-TOLUENE (sur.)	%	102	93	103		7647930
RDL = Reportable Detection Limit						

Maxxam Job #: B482541  
Report Date: 2014/09/24

PINCHIN ENVIRONMENTAL LTD  
Client Project #: 80038.001  
Sampler Initials: RS

**GENERAL COMMENTS**

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

Maxxam Job #: B482541  
Report Date: 2014/09/24

### QUALITY ASSURANCE REPORT

PINCHIN ENVIRONMENTAL LTD  
Client Project #: 80038.001  
Sampler Initials: RS

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7644702	O-TERPHENYL (sur.)	2014/09/19	108	50 - 130	112	50 - 130	106	%		
7647930	4-Bromofluorobenzene (sur.)	2014/09/22	105	60 - 140	106	60 - 140	101	%		
7647930	D4-1,2-Dichloroethane (sur.)	2014/09/22	99	60 - 140	96	60 - 140	103	%		
7647930	D8-TOLUENE (sur.)	2014/09/22	103	60 - 140	103	60 - 140	101	%		
7644702	F2 (C10-C16 Hydrocarbons)	2014/09/19	114	50 - 130	130	70 - 130	<0.15	mg/L	NC	40
7644702	F3 (C16-C34 Hydrocarbons)	2014/09/19	113	50 - 130	127	70 - 130	<0.15	mg/L	NC	40
7644702	F4 (C34-C50 Hydrocarbons)	2014/09/19	102	50 - 130	110	70 - 130	<0.15	mg/L	NC	40
7647930	(C6-C10)	2014/09/22	93	70 - 130	120	70 - 130	<300	ug/L	NC	40
7647930	Benzene	2014/09/22	99	70 - 130	99	70 - 130	<0.4	ug/L	NC	40
7647930	Ethylbenzene	2014/09/22	106	70 - 130	110	70 - 130	<0.4	ug/L	NC	40
7647930	F1 (C6-C10) - BTEX	2014/09/22					<300	ug/L	NC	40
7647930	m & p-Xylene	2014/09/22	111	70 - 130	116	70 - 130	<0.8	ug/L	NC	40
7647930	Methyl-tert-butylether (MTBE)	2014/09/22	106	70 - 130	105	70 - 130	<4	ug/L	NC	40
7647930	o-Xylene	2014/09/22	110	70 - 130	114	70 - 130	<0.4	ug/L	NC	40
7647930	Toluene	2014/09/22	102	70 - 130	105	70 - 130	<0.4	ug/L	NC	40
7647930	Xylenes (Total)	2014/09/22					<0.8	ug/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 Job #: B482541  
Report Date: 2014/09/24

PINCHIN ENVIRONMENTAL LTD  
Client Project #: 80038.001  
Sampler Initials: RS

### VALIDATION SIGNATURE PAGE

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



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Andy Lu, Data Validation Coordinator

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



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

**CHAIN OF CUSTODY RECORD**

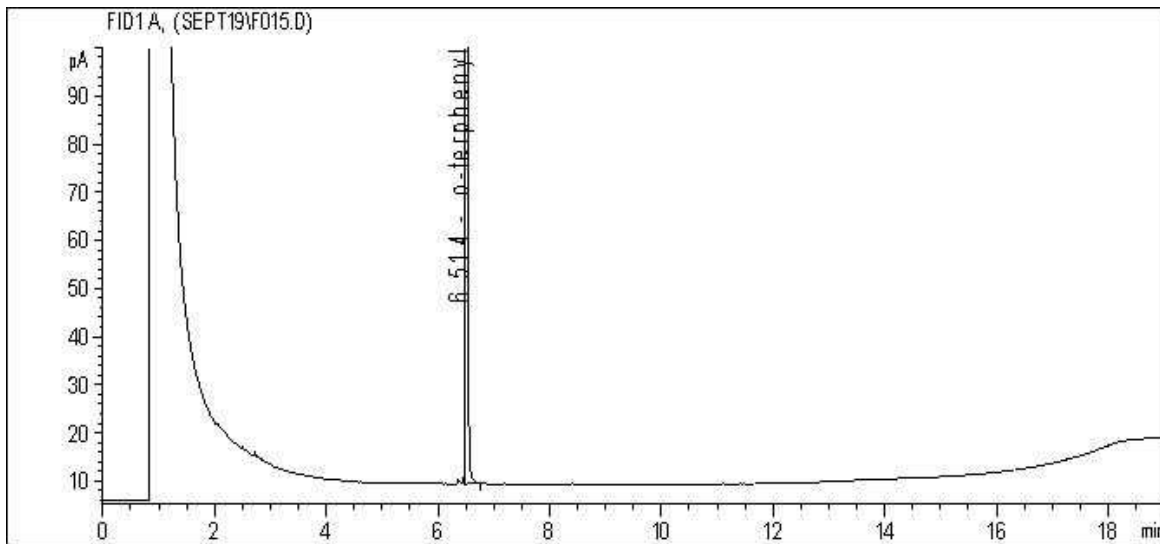
Page 1 of 1

<b>INVOICE INFORMATION</b>		<b>REPORT INFORMATION (if different from invoice)</b>		<b>PROJECT INFORMATION</b>		<b>MAXXAM JOB NUMBER</b>	
Company Name: <u>Pinchin Ltd.</u>		Company Name: _____		Quotation #: _____		B482541	
Contact Name: <u>Robert Slater</u>		Contact Name: _____		P.O. #: _____		CHAIN OF CUSTODY #	
Address: <u>54 Terracon Place</u>		Address: _____		Project #: <u>80038.001</u>		N 000722	
<u>Winnipeg, MB</u>		Phone: _____ Fax: _____		Project Name: _____			
Phone: <u>204520983</u> Fax: <u>204453 0788</u>		Email: _____		Location: _____			
Email: <u>rslater@pinchin.com</u>				Sampled By: <u>RS</u>			

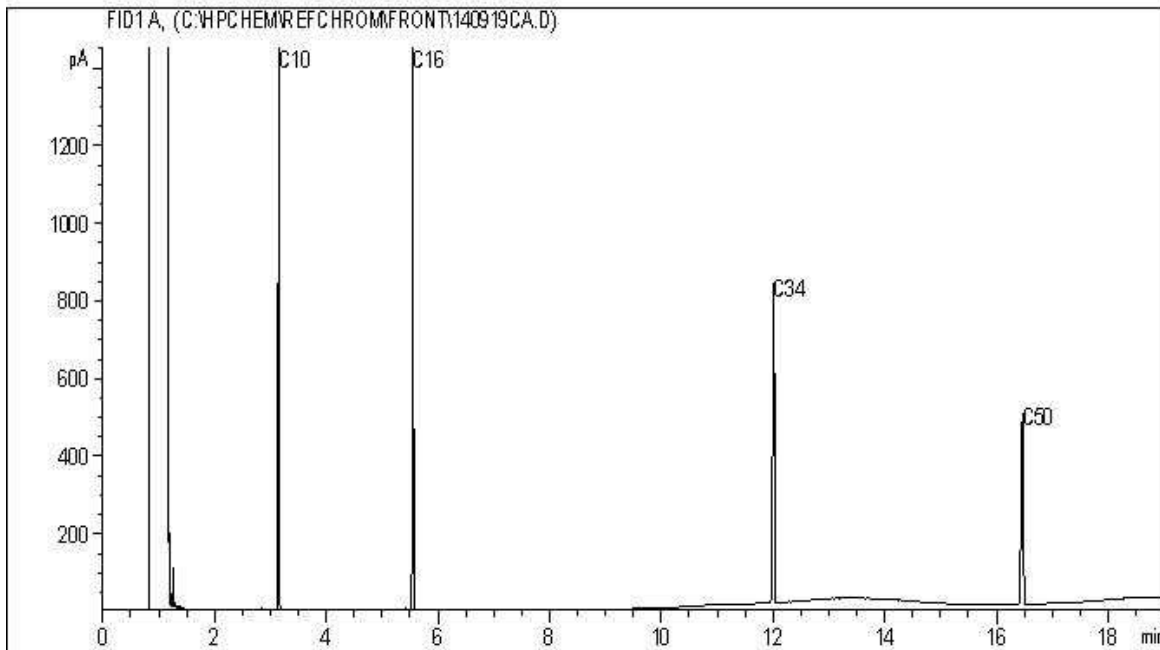
<b>REGULATORY REQUIREMENTS SERVICE REQUESTED:</b>						<b>ANALYSIS REQUESTED (Please be specific)</b>										<b>TURNAROUND TIME (TAT) REQUIRED</b>				
<input type="checkbox"/> CCME <input type="checkbox"/> DRINKING WATER <input checked="" type="checkbox"/> Other: <u>MOE Guidelines for groundwater</u>						<input type="checkbox"/> Total <input type="checkbox"/> Fecal <input type="checkbox"/> E. coli <input type="checkbox"/> MF <input type="checkbox"/> MPN <input type="checkbox"/> OT Field Filtered? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N Field Acidified? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N Field Acidified? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N Total Metal BTEX BTEX / F1 F2 - F4 PCB Biochemical Oxygen Demand										<b>PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS.</b> <b>Regular (Standard) TAT:</b> <input checked="" type="checkbox"/> 5 to 7 Working Days <b>Rush TAT:</b> <input type="checkbox"/> 1 day <input type="checkbox"/> 2 days <input type="checkbox"/> 3 days DATE Required: _____ TIME Required: _____ <small>TATs for certain tests are &gt; 5 days. Please contact your Project Manager for details.</small>				
<b>SPECIAL INSTRUCTIONS:</b>						<b>DRINKING WATER? (Y / N)</b>										<b>HOLD - DO NOT ANALYZE</b>				
<b>SAMPLES MUST BE KEPT COOL (&lt;10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM.</b>																				
	Lab Use	Sample Identification	Date Sampled	Time Sampled	Matrix (GW, SW, Soil etc)													# of Cont.	COMMENTS / TAT COMMENTS	
1	<u>KP8032</u>	<u>MW1</u>	<u>Sept 16</u>	<u>1030</u>	<u>GW</u>														5	
2	<u>↓ 33</u>	<u>MW2</u>	<u>↓</u>	<u>1045</u>	<u>↓</u>														5	
3	<u>↓ 34</u>	<u>MW3</u>	<u>↓</u>	<u>1100</u>	<u>↓</u>														5	
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
<b>RELINQUISHED BY (Signature/Print)</b>			<b>RECEIVED BY (Signature/Print)</b>			<b>Date</b>		<b>Time</b>		<b>#JARS USED AND NOT SUBMITTED</b>		<b>Laboratory Use Only</b>								
<u>Robert Slater</u>			<u>[Signature]</u>			<u>2014/09/17</u>		<u>14:30</u>				Temperature (°C) on Receipt <u>7.2, 9.2, 9.0 °C</u>								

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

CCME Hydrocarbons (F2-F4 in water) Chromatogram



Carbon Range Distribution - Reference Chromatogram

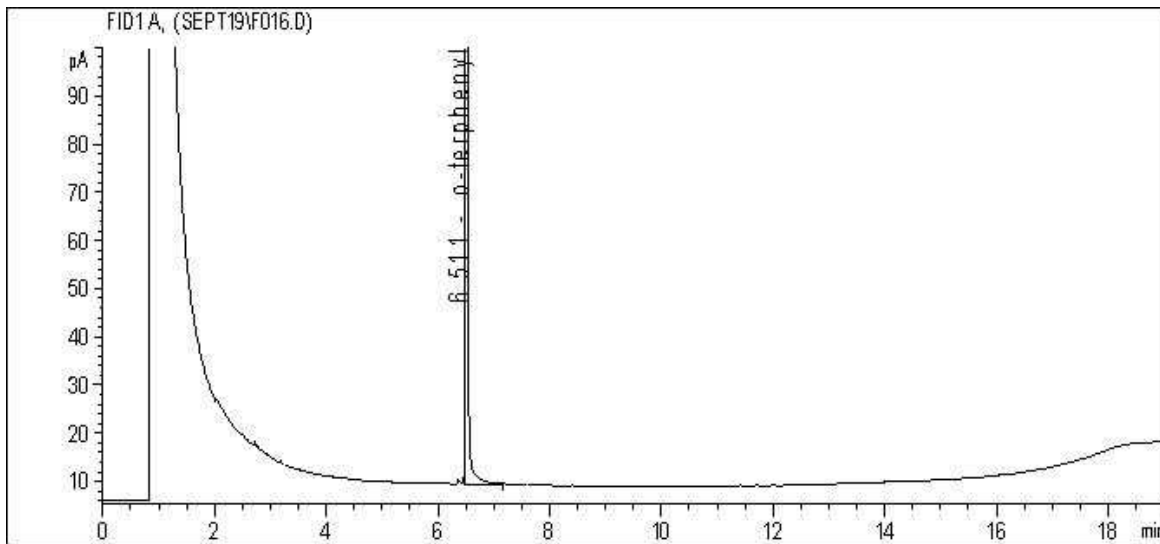


TYPICAL PRODUCT CARBON NUMBER RANGES

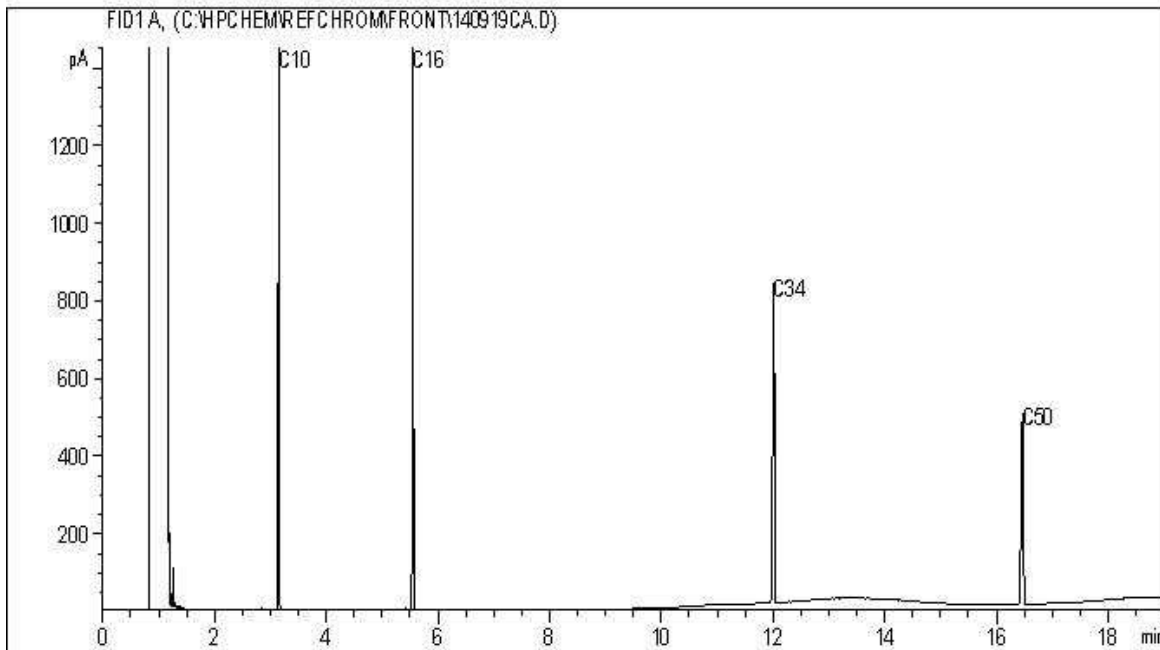
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40

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 water) Chromatogram



Carbon Range Distribution - Reference Chromatogram



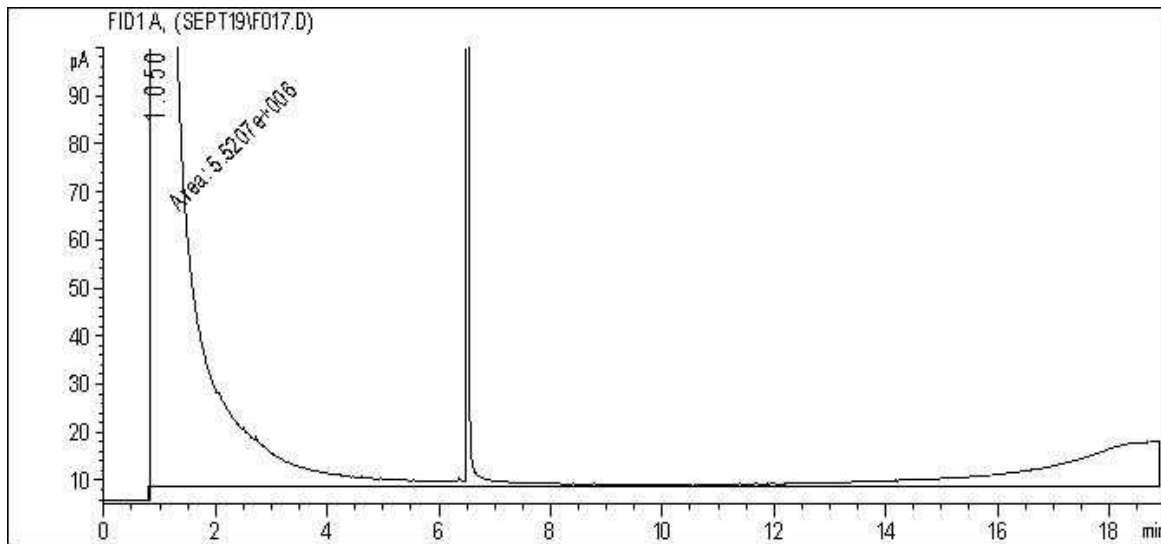
TYPICAL PRODUCT CARBON NUMBER RANGES

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

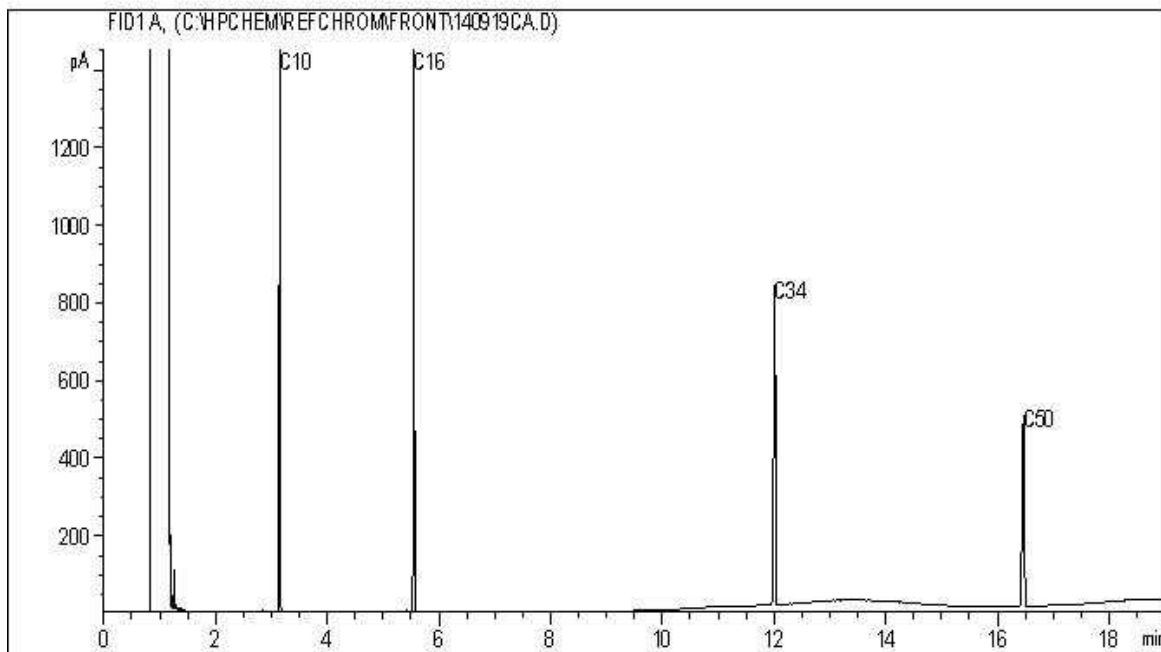
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.



CCME Hydrocarbons (F2-F4 in water) Chromatogram



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.