

Imperial Oil

Products and Chemicals Division Room 29007, 237 - 4th Ave SW Calgary, AB T2P 0H6 Andrew Hodgetts E.I.T. Site Remediation Specialist Engineering Maintenance & Remediation Tel: (403) 237-2852 Fax: (403) 237-2237 Cell: (403) 813-2614

March 30, 2005

IOL Site: 860265/ 88001943

Manitoba Conservation Environmental Operations Suite 160 - 123 Main Street Winnipeg, Manitoba R3C 1A5 Phone: (204) 945-7053

Att: Mr. Randy Webber



Re: Former Imperial Oil Limited Service Station Red River Esso 287 Main Street, Selkirk, Manitoba Underground Storage Tank Removal and Intrusive Assessment Report

These documents and the information contained in them are confidential - property of Imperial Oil and any disclosure of same is governed by the provisions of each of the applicable provincial or territorial Freedom of Information legislation, the Privacy Act (Canada) 1980-81-82-83, c.111, Sch. II "1" and the Access to Information Act (Canada) 1980-81-82-83, c.111, Sch. I "1", as such legislation may be amended or replaced from time to time.

Enclosed is one copy of the following report regarding the environmental investigation completed at the above noted property by Imperial Oil Limited's (IOL) consultant AMEC Earth & Environmental:

• Environmental Assessment Program, Former IOL Automotive Retail Station, 287 Main Street, Selkirk, Manitoba by AMEC Earth & Environmental dated October 22, 2004.

An excerpt report pertaining to the City of Selkirk property has been prepared for the above noted report. A copy of the off site excerpt report is not enclosed as all information is contained in the above noted report. Manitoba Conservation will be copied on the correspondence to the City of Selkirk c/o Steve Fedak.

Also included is one copy of following reports from previous environmental investigations and remedial excavations that were completed on the site:

- ♦ Phase II Environmental Assessment, Red River Esso Service Station, Site #860265, 287 Main Street, Selkirk, Manitoba by Aqua Terre Solutions Inc. dated October 15, 2003
- Intrusive Investigation report by O'Connor Associates Environmental Inc. dated January 3, 1989
- Intrusive Investigation report by O'Connor Associates Environmental Inc. dated December 22, 1988

The site soil has been characterized as fine-grained for surface and subsoils for risk assessment purposes. The apparent direction of groundwater flow is to the south. The site is considered a commercial location. The vapour inhalation and eco-contact pathways have been selected for reference purposes at this site.

Laboratory analyses of soil samples taken from boreholes, test pits and monitoring wells installed on-site indicate some residual hydrocarbon constituents exist in the soil at concentrations exceeding the reference criteria for the site. This condition appears to be contained to site.

Laboratory analyses of shallow groundwater samples taken from boreholes installed on-site did not identify residual hydrocarbon constituents at concentrations exceeding the reference criteria for the site. Liquid hydrocarbon product was not observed in any of the monitoring wells.

This site will now be placed into long term management.

If you have any further questions please call me at (403) 237-2852.

Andrew Hodgetts

Yours truly

CC (w/o enclosures):

♦ Salem Rizvi - Devon Estates Ltd. Calgary Alberta

FINAL

ENVIRONMENTAL ASSESSMENT PROGRAM

STORY

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FORMER IOL AUTOMOTIVE RETAIL STATION 287 MAIN STREET SELKIRK, MANITOBA 860265/88001943

NOTICE

ACCESS TO INFORMAT: ON ACT These documents and the information contained in them are

Submitted to:

IMPERIAL OIL LIMITED

237 Fourth Avenue SW

PO Box 2480, Station 'M'

Calgary, Alberta

T2P 0H6

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Attention: Mr. Andrew Hodgetts Site Remediation Specialist

Submitted by:

AMEC Earth & Environmental, a division of AMEC Americas Limited 440 Dovercourt Drive Winnipeg, Manitoba R3Y 1N4

Prepared by: Michael Bertram, P. Eng. Reviewed by: Mark Humbert, P. Eng.

22 October 2004

AMEC File no. WX05876

Dist: (3) Addressee (1) AMEC, Winnipeg





EXECUTIVE SUMMARY

Former IOL Automotive Retail Station, 287 Main Street (860265/88001943), Selkirk, Manitoba

Type of Facility	Vacant – former retail fuel and car wash, with
	propane tank and dispenser
Date of preliminary monitoring	30 June 2004
Date of UST pull observance and	12 – 13 July 2004
excavation sampling	
Date of test pitting	16 July 2004
Date of intrusive investigation soil	04 – 06 August 2004
sampling	
Date of monitoring	30 August 2004
Number of test holes drilled	10
Number of wells installed in boreholes	10
Number of test pits excavated	6
Type of OVM meter	Gastech 1238 ME
Land use adjacent to Site	West: Public lane followed by residences;
	North: Rosser Avenue followed by partially occupied
*	strip mall;
	South: Pacific Avenue followed by Co-op Gas Bar; and
	East: Main Street followed by mixed commercial /
	multi-family residential.
Aquifer usage within 100 m radius	No current use - potential for use unlikely due to
	water quality and presence of municipal water supply
	system.



IOL Former Automotive Retail Station, 287 Main Street (860265/88001943), Selkirk, Manitoba

	04-01	04-02	04-03	04-04	04-05	04-06	04-07	04-08	04-09	04-10	Comments
Well Installed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Depth of Test Hole	7.6 m	6.1 m	6.1 m	6.9 m	6.1 m	7.6 m	5.5 m	6.1 m	6.1 m	6.1 m	
Soil type from grade to between 0.9 and 1.5 m	granular fill	clay fill	clay fill	granular fill	granular fill	granular fill	granular fill	granular fill	granular fill	clay fill	Asphalt and/or concrete on grade at 04-03, 04-05, and 04-09
Soil type to between 3.4 and 5.2 m	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	
Soil type up to 7.6 m	Clay Till	Clay Till	Clay Till	Clay Till	Clay Till	Clay Till	Clay Till	Clay Till	Clay Till	Clay Till	
Refusal/ Bedrock	7.6 m	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Dominant soil type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	
Homogeneous	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Depth to water	1.78	1.36	'1.71	0.64	2.68	2.42	1.18	3.51	2.76	1.34	Water levels measured on 30 August 2004
Screen interval of well	6.7-7.6 m	3.1-6.1 m	3.1-6.1 m	6.0-6.9 m	3.1-6.1 m	6.7-7.6 m	4.5-5.5 m	3.1-6.1 m	3.1-6.1 m	3.1-6.1 m	7 tagast 2004
Exceeds referenced soil guideline	No	No	No	No	No	No	No	No	No	No	
Exceeds referenced water criteria	No	No	No	No	No	No	No	No	No	No	,
Vapours in adjacent manholes/sewers	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Maximum depth of soil hydrocarbon impact in excess of applicable guideline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Vertical soil delineation achieved	No	NA	NA	NA	NA	NA	NA	NA	NA	NA	



IOL Former Automotive Retail Station, 287 Main Street (860265/88001943), Selkirk, Manitoba

	TP01	TP02	TP03	TP04	TP05	TP06	Comments
Well Installed	No	No	No	No	No	No	
Depth of Test Pit	3.1 m	. 3.7 m	3.4 m	3.1 m	3.1 m	3.7 m	
Soil type from grade to between 0.6 and 2.4 m	Granular Fill	Granular, clay, and silt fill	Granular, clay, and silt fill	Granular, clay, and silt fill	Granular and clay fill	Granular and clay fill	Asphalt on grade at TP06
Soil type up to 3.7 m	Clay	Clay	Clay	Clay	Clay	Clay	
Refusal/ bedrock	NA	NA	NA	· NA	NA	NA	
Dominant soil type	Clay	Clay	Clay	Clay	Clay	Clay	-
Homogeneous	Yes	Yes	Yes	Yes	Yes	Yes	
Depth to water	NA	NA	NA	NA	NA	NA	
Screen interval of well	NA	NA NA	NA	NA	NA	NA	
Exceeds referenced soil guideline	No	Yes	No	No	No	Yes	
Exceeds referenced water criteria	NA	NA	NA .	NA	NA	NA	
Vapours in adjacent manholes/sewers	NA	NA	NA	NA	NA	NA	
Maximum depth of soil hydrocarbon impact in excess of applicable guideline	NA	3.7 m	NA	NA	NA	>3.7 m	
Vertical soil delineation achieved	NA	Yes	NA	NA ·	NA	No	



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1.0 INTRODUCTION

AMEC Earth & Environmental, a division of AMEC Americas Limited (AMEC) of Winnipeg, Manitoba was retained by Mr. Andrew Hodgetts of Imperial Oil Limited (IOL) to conduct an environmental assessment of a former automotive retail property located at 287 Main Street in Selkirk, Manitoba. The IOL property is subsequently referred to as the 'Site' in this report. A topographic representation of Selkirk and Surrounding area is shown on Figure 1. The location of the Site within the City of Selkirk is shown on Figure 2. The Site and adjacent land use properties are shown on Figure 3.

This report summarizes the results of the assessment conducted at the Site by AMEC from June to August 2004.

2.0 SCOPE

The scope of work included the supervision and project coordination of the environmental assessment conducted at the Site, and included the following tasks:

- Confirm the Site boundaries by legal survey and develop a Site plan that shows the property boundary and location of structures.
- Conduct a preliminary monitoring of existing groundwater wells to aid in refining the assessment program. Submit groundwater samples for petroleum hydrocarbon (PHC) analysis
- Observe and photograph removal and record ultimate disposal of underground storage tanks (USTs). Obtain soil samples from sidewalls and base of the UST excavations; submit soil samples for PHC analysis.
- Complete test pitting with backhoe in areas of suspected impact and submit soil samples for PHC analysis.
- Conduct an intrusive assessment to delineate on-site impacted areas identified during
 previous phases of work. Complete site sensitivity assessment. Collect soil and
 groundwater samples and submit for analysis of PHC, metals, glycol, and/or PAH's based on
 potential impact sources.
 - Complete assessment report summarizing the findings of the field programs, site sensitivity assessment, laboratory analysis and the soil and groundwater analytical data in comparison to the applicable hydrocarbon guideline.

There were no significant derivations from the scope of work during this project.



3.0 SITE DESCRIPTION AND BACKGROUND

3.1 GENERAL DESCRIPTION

Note that all directions stated in this report are in relation to "Report North" as shown on Figure 4. Report North is parallel to Main Street, approximately 45° clockwise from True North.

The Site is located on the western side of Main Street in the City of Selkirk, as shown on Figure 2. The Site was developed with a kiosk/convenience store and carwash buildings, pump islands and canopy, a propane dispensing unit and tank, and USTs. The Site ground surface consisted of asphalt paving. Concrete aprons were present around the pump islands and above the UST nest.

The four fibreglass (FRP) USTs were located south of the pump islands, which were located east of the kiosk. Each of the USTs stored gasoline, however diesel fuel may also have been historically dispensed at the Site. The vents for the USTs were located adjacent to the kiosk on the western portion of the Site.

At the time of the UST removal all utilities to the Site had been disconnected.

3.2 BACKGROUND

The earliest information regarding the Site obtained by AMEC was an air photo for 1966, in which the property appeared to house two single-family residential developments. The Site has been occupied by a service station with retail petroleum facilities since approximately 1972. IOL's purchase of the Site appears to have been conducted in approximately 1976. Based on drawings and reports obtained from IOL, the Site configuration in 1988 consisted of:

- a three bay service station (historical service station) centralized near the western boundary of the Site;
- five 5000 gallon (22750 L) steel USTs (historical UST nest) centralized in the southern portion, and
- two pump islands (historical pump islands) in the central portion of the Site.

A 500 gallon (2275 L) waste oil tank was also reported to be immediately north of the historical service station's footprint. The location of the historical structures and facilities are shown on Figure 4.

In May 1989, the five steel USTs were removed and the four 5000 gallon (22750 L) fibreglass USTs were installed immediately northeast of the previous USTs. On or about 1994, the service station was removed and the kiosk/convenience store was erected within the footprints of the former structure. As well, the newer pump islands and canopy were installed, the carwash was erected on the southern portion of the Site, and the residential property west of the car wash



location was purchased and redeveloped into the car wash entrance. The configuration of the newer developments, prior to demolition, are shown on Figure 4.

During the course of the assessment and decommissioning activities in 2004, all structures at the Site were decommissioned and removed. All of the former retail petroleum handling and storage facilities were likewise removed.

3.3 SITE TOPOGRAPHY AND DRAINAGE

The Site was relatively flat lying with drainage expected to be directed towards catch basins located onsite and the outlying streets.

3.4 SURFACE WATER

The nearest surface water body is the Red River, located approximately 340 m northeast of the Site.

3.5 DRINKING WATER SUPPLY

According to the City of Selkirk, water in the Selkirk area is provided by the treated municipal system that draws its water from four municipal wells located approximately 1 km north and east of the Site. According to the water well records, the municipal well depths range from 26 m to 83 m below grade and draw water from the Carbonate Aquifer located in the limestone bedrock.

Provincial well records indicate that there are approximately 20 domestic groundwater wells located within the City of Selkirk. The nearest well identified appears to be approximately 350 m upgradient of the Site, based on the shallow groundwater flow direction. The City of Selkirk is not aware of any properties within city limits that are not connected to the municipal supply. Given that the City has a domestic water supply, it is doubtful that the groundwater wells identified are presently in use for domestic purposes.

3.6 SITE PREVIOUS INVESTIGATIONS

Previous investigations at the Site have been reported in the following:

- 1988, August through October O'Connor Associates Environmental Inc. (O'Connor) monitoring of UST nest piezometers and VES.
- 1988, November O'Connor intrusive assessment, included eleven (11) boreholes with monitor wells (BH1 to BH11).
- 1989, January O'Connor eastern remedial trench installation, included six (6) piezometer (PZ12 to PZ17) and one (1) recovery well (RW1).
- 1989, February O'Connor western remedial trench installation, included five (5) piezometer (PZ18 to PZ22) and one (1) recovery well (RW2).



- 1989, March through April O'Connor monitoring of boreholes, trench and tank nest piezometers and multiple VES.
- 1989, May O'Connor tank removal assessment, included eight (8) piezometer (PZ23 to PZ26, PZ28 to PZ31) installed in excavations (new and old tank nests) and at pump islands. VES headers attached to all piezometers.
- 1989, July through 1998, May O'Connor monitoring of boreholes, trench and tank nest piezometers and multiple VES.
- 2003 Aqua Terre Solutions Inc. (Aqua Terre) intrusive assessment, included seven (7) boreholes with monitor wells (MW32 to MW38).

The O'Connor monitoring reports indicate that 243 L of free product were manually bailed from various boreholes or piezometers between 1988 and 1998. In addition, the equivalent of 3573 L of free product were removed through vapour extraction. The groundwater gradient measured over the monitoring period was generally to the east or southeast.

4.0 INVESTIGATIVE METHODOLOGY

4.1 SURROUNDING LAND USE

A visual survey of the surrounding land uses was conducted during the course of AMEC's Site investigation. The purpose of the survey was to identify specific land uses (i.e. agricultural, residential, commercial or industrial) adjacent to the Site in order to assess potential sensitivities to soil and groundwater impacts. The surrounding land uses are detailed in Section 6.1 and are shown on Figure 3.

4.2 CONTAMINANTS OF CONCERN SELECTION

Based on past operations and storage practices conducted at the Site and adjoining properties, the following potential impact originating sources were identified and the respective contaminants of concern were selected for the assessment program.

- Historical and former USTs and pumps The main operation of these facilities was the storage and dispensing of gasoline (and possibly diesel). The potential contaminants of concern associated with these facilities are PHCs (BTEX, F1 – F4) and lead (as the storage and handling of gasoline was conducted prior to 1989).
- Service station and waste oil UST The main operation of these facilities was the
 servicing of automobiles and storage of waste fluids, including oil and coolant handling.
 The potential contaminants of concern associated with these facilities are PHCs (BTEX,
 F1 F4), PAH's (indicator PAH's benzo(a)pyrene and naphthalene have been selected
 as a preliminary screen), glycol, and metals (arsenic, barium, chromium, copper, lead,
 and zinc selected based on content concentration in motor oil and toxicological
 properties).



Car Wash - The main operation of this facility was the cleaning of automobiles, which
may have resulted in the release of oil residue or sludge into the wash sump. The
potential contaminants of concern associated with this facility are PHCs (BTEX, F1 – F4)
and metals (arsenic, barium, chromium, copper, lead, and zinc selected based on
content concentration in motor oil and toxicological properties).

4.3 HAZARD ASSESSMENT AND SERVICE LOCATIONS

AMEC was present for the safety kick-off meeting initiating the UST removal program (which included the test pitting), which was conducted by HAZCO Environmental Services Ltd (HAZCO) on 12 July 2004. As well, AMEC signed-off on the daily safe work permit for each day AMEC was present at the Site.

In accordance with IOL's Safety Program for Contractors, prior to the start of the intrusive investigation program, AMEC completed a hazard assessment, prepared an emergency action plan, and held a safety kick-off meeting. The IOL project manager, AMEC field staff and the drilling subcontractor were in attendance at the kick-off meeting, conducted 04 August 2004.

As part of the hazard assessment for the intrusive investigation, AMEC contacted the local utility service providers to identify and mark their respective underground utility locations. Manitoba Telecommunications System (MTS), Manitoba Hydro / Centra Gas, Shaw Cable and the City of Selkirk were contacted and conducted underground line locates prior to the start of the drilling program.

To discuss and identify project risks during the intrusive investigation, tailgate meetings were held, daily safe work permits were issued and planned job observations and last minute risk assessments were conducted.

4.4 LEGAL SITE SURVEY

AMEC contracted Pollock & Wright Land Surveyors (Pollock and Wright) to conduct a legal survey of the Site. The survey was conducted on 5 August 2004. A copy of the legal survey plan is included in Appendix A.

4.5 PRELIMINARY SITE MONITORING

On 30 June 2004, AMEC monitored and sampled each of the accessible monitoring wells previously installed at or near the Site. The monitoring program included the following (in order):

- Measurement of monitor well vapour concentration;
- Determination of presence and thickness of free product;
- Determination of groundwater level;
- Development and purging of the well;



- Measurement of groundwater vapour concentration; and
- Collection of groundwater samples for laboratory analysis.

Vapour concentrations were measured with a GasTech combustible vapour analyzer set in the no methane response mode and liquid levels were measured with an electronic interface probe. Sampling was conducted with a dedicated PVC bailer in accordance with standard monitoring and sampling procedures.

Groundwater samples were placed in clean certified bottles provided by the laboratory and stored in an insulated cooler while on Site and during transport to the laboratory. The field protocols and QA/QC procedures utilized by AMEC during the preliminary Site monitoring were in accordance with IOL standards and industry protocols.

4.6 UST REMOVAL PROGRAM

AMEC's involvement in the UST removal program occurred between 13 to 16 July 2004. AMEC conducted Site visits to witness the excavation and extraction of each UST in order to photograph and document the condition of the USTs. The excavation was conducted by HAZCO. Ms. Andrea Hachkowski, E.I.T. of AMEC conducted the Site visits.

Following removal of the USTs from the Site, soil samples were collected from the excavated soils, the final excavation walls and from the base for field screening. Soil samples were classified according to the Modified Unified Soil Classification system and observed for visual evidence of hydrocarbon impacts. Soil samples were field screened for volatile hydrocarbon vapours using ambient temperature headspace (ATH) techniques and a hexane calibrated, GasTech combustible vapour analyzer set in the no methane response mode. Vapours were measured in parts per million (up to 500 ppm_v) and percent lower explosive limit (%LEL) above 500 ppm_v. The ATH test results provide an indication of the presence of volatile hydrocarbons in the soil samples, and aid in the selection of appropriate samples for laboratory analysis. The field protocols and QA/QC procedures utilized by AMEC were in accordance with standard industry and IOL protocols.

Duplicate soil samples, for possible submission for laboratory analysis, were placed in labelled glass jars with teflon-lined lids and stored in a cooler at the Site. Based on the ATH test results, selected samples were transported in iced coolers to the laboratory. The sample shipment was accompanied by an appropriately completed chain-of-custody form.

The extent of the UST removal excavation is shown on Figure 5 and the location of soil samples obtained from the final limits of the excavation and the associated ATH vapour concentrations are shown on Figure 6. Samples submitted for laboratory analysis are also identified on Figure 6.



4.7 TEST PITTING PROGRAM

Following the UST removal program, test pitting was conducted in locations of potential impact sources; including at the pump bases, carwash drain, and UST nest. A total of six test pits (TP01 to TP06) were advanced at the Site. The backhoe was supplied and operated by HAZCO. Ms. Andrea Hachkowski, E.I.T., of AMEC supervised the test pitting program on 16 July 2004. The location and orientation of the test pits are shown on Figure 7.

Soil samples were obtained from the backhoe bucket at 0.7 m depth intervals as well as zones of visual impacts and/or at each stratigraphic change. As with the UST removal sampling program, soil samples were classified according to the Modified Unified Soil Classification system and observed for visual evidence of hydrocarbon impacts. Soil samples were field screened for volatile hydrocarbon vapours using ambient temperature headspace (ATH) techniques and a hexane calibrated, GasTech combustible vapour analyzer set in the no methane response mode. Vapours were measured in parts per million (up to 500 ppm_v) and percent lower explosive limit (%LEL) above 500 ppm_v. The ATH test results provide an indication of the presence of volatile hydrocarbons in the soil samples, and aid in the selection of appropriate samples for laboratory analysis. The field protocols and QA/QC procedures utilized by AMEC were in accordance with standard industry and IOL protocols.

Soil samples were placed in labelled glass jars with teflon lined lids and stored in a cooler at the site and during transport to the laboratory. The sample shipment was accompanied by an appropriately completed chain-of-custody form.

The test pits were backfilled with the excavated materials and were horizontally located in relation to a fixed benchmark. Test pit logs are provided in Appendix B.

4.8 INTRUSIVE ASSESSMENT PROGRAM

4.8.1 Drilling and Soil Sampling Program

The test hole drilling program was conducted on 4 to 6 August 2004 and consisted of a total of ten (10) test holes (04-01 to 04-10) advanced at the Site. The drill rig was supplied and operated by Maple Leaf Drilling Ltd. Ms. Andrea Hachkowski, E.I.T., of AMEC supervised the drilling program on a full time basis. Test hole locations, as shown on Figure 7, were selected based on the results of the UST removal and test pit sampling programs, previous environmental investigations, and field conditions encountered. Test hole logs are provided in Appendix B.

At each of the test holes locations, soil samples were recovered from augers as grab samples or from split spoon samplers on a continuous basis up to a depth of 6.1 m below grade. Grab samples were generally collected only to a depth of 1.5 m but extended to up to 6.1 m in test holes 04-1, 04-6, 04-8 due to the presence of large rocks or concrete in the test holes. Disturbed soils from the outside of the grab and spoon samples were removed to minimize potential cross contamination. Soil samples were also obtained in zones of visual impacts



and/or at each stratigraphic change. Augers were cleaned between holes and split spoons were cleaned between sample locations.

As with the previous assessment tasks, soil samples were classified according to the Modified Unified Soil Classification system and observed for visual evidence of hydrocarbon impacts. Soil samples were field screened for volatile hydrocarbon vapours using ambient temperature headspace (ATH) techniques and a hexane calibrated, GasTech combustible vapour analyzer set in the no methane response mode. Vapours were measured in parts per million (up to 500 ppm_v) and percent lower explosive limit (%LEL) above 500 ppm_v. The ATH test results provide an indication of the presence of volatile hydrocarbons in the soil samples, and aid in the selection of appropriate samples for laboratory analysis. The field protocols and QA/QC procedures utilized by AMEC were in accordance with standard industry protocols.

Soil samples were placed in labelled glass jars with teflon-lined lids and stored in a cooler at the site and during transport to the laboratory. The sample shipment was accompanied by an appropriately completed chain-of-custody form.

The test holes and monitor wells were horizontally and vertically located in relation to a fixed benchmark. Ground surface and monitor well elevations were referenced to the top of nut of a fire hydrant located near the southeast corner of the property, with an assumed elevation of 100.00 m.

Drill cuttings were placed into mega bags and have been scheduled for collection and disposal.

4.8.2 Monitoring Well Installation and Return Groundwater Sampling Program

As part of the intrusive assessment, monitoring wells were installed at each test hole locations. Each well was installed in order to monitor subsurface vapour concentrations, establish the groundwater conditions and to allow for groundwater sampling. The monitoring wells were constructed with 50 mm diameter Schedule 40 PVC, number 10 slot well screen and 50 mm diameter Schedule 40 PVC solid riser pipe to the surface. The monitor well construction details are shown on the applicable test hole logs (Appendix B).

On 30 August 2004, AMEC monitored and sampled each of the newly installed wells. The monitoring program included the following (in order):

- Measurement of monitoring well vapour concentrations;
- Determination of presence and thickness of free product:
- Determination of groundwater levels;
- Development and purging of the wells;
- Determination of groundwater vapour concentrations; and
- Collection of groundwater samples for laboratory analysis; and
- Measurement of hydraulic conductivities on two of the monitoring wells



Groundwater samples were obtained from the new wells and from those wells that were not sampled during the preliminary monitoring program, as well as from one well (BH10) sampled from the preliminary monitoring program to provide correlation between the two events.

Vapour concentrations were measured with a GasTech combustible vapour analyzer set in the no methane response mode and liquid levels were measured with an electronic interface probe. Due to the slow recharge rate, monitoring wells were not purged prior to sampling. Sampling was conducted with a dedicated PVC bailer in accordance with standard monitoring and sampling procedures.

Groundwater samples were placed in clean certified bottles provided by the laboratory and stored in an insulated cooler while on Site and during transport to the laboratory. As with the previous soil sampling programs, the field protocols and QA/QC procedures utilized by AMEC during Site monitoring were in accordance with standard industry protocols.

4.8.3 LABORATORY ANALYSIS

Soil and groundwater samples were submitted for laboratory analysis at PSC Analytical Services in Burnaby, BC. In total 32 soil samples, including QA/QC samples, were submitted for analysis of BTEX, fractional petroleum hydrocarbons (F1-F4) and lead based on an evaluation of the field observations, headspace vapour concentrations, location, depth and soil type. In addition, two soil samples were analyzed for the metals arsenic, barium, chromium, copper, lead, and zinc, as well as glycol (ethylene, diethylene, and propylene), and two soil samples were analyzed for PAH's benzo(a)pyrene and naphthalene. Two additional soil samples were selected for grain size analysis. In total 26 groundwater samples from the existing and newly installed monitoring wells, including QA/QC samples, were submitted for analysis of BTEX, volatile hydrocarbons (F1), semi-volatile hydrocarbons (F2), and lead.

A summary of the laboratory analysis level of effort is included in Table 1, appended to this report. The laboratory Certificates of Analysis and AMEC's Data Quality Review Checklists are provided in Appendix C.

5.0 REFERENCED GUIDELINE CRITERIA

AMEC completed a detailed assessment of the applicable guidelines and criteria typically utilized within the Province of Manitoba, to assess guideline values for comparison of analytical data. These criteria include:

- 1999 CCME Environmental Quality Guidelines (EQG) for soil (Updated 2003);
- 2001 CCME Canada Wide Standards for Hydrocarbons in Soil (CWS PHC); and
- 1997 Ontario Ministry of Environment (MOE) Guideline for Use at Contaminated Sites



The above documents were considered relative to the Site's potential commercial land use, as well as the adjacent commercial and residential land uses. An evaluation of potential receptors and pathways was undertaken as part of the assessment programs. The assessment of the applicable exposure pathways is summarized in Tables D1 to D5, Appendix D. The referenced guideline criteria for the Site and adjacent property to the north are summarized as follows:

5.1 EXPOSURE PATHWAYS

Groundwater

<u>Groundwater Ingestion:</u> The sensitivity ranking for groundwater was non-potable for the following reasons:

- 1) The City of Selkirk has a municipal water supply to the Site and surrounding properties. The source of the municipal system is approximately 0.6 km from the Site.
- 2) The hydraulic conductivity of the near surface groundwater was measured to be 3.2 x 10⁻⁶ cm/sec, which is less than the 10⁻⁴ cm/sec minimum value specified by CCME in CWS PHC for the aquifer to be considered a potential drinking water pathway. The CWS indicates that a drinking water pathway is assumed to be applicable only if groundwater is available at sufficient yield.
- 3) A potential domestic use aquifer (DUA) would appear to be present in the area at depths below 25 m below the ground surface. Shallow groundwater impacts appear to be separated from the underlying DUA by greater than 5 m of soil with bulk hydraulic conductivities ranging from 3.2 x 10⁻⁶ cm/sec to 2.6 x 10⁻⁷ cm/sec.
- 4) According to a search of the water well records for the City of Selkirk, there appears to be no known potable wells within 500 m downgradient of the Site.

In summary, the groundwater at the Site is considered to be non-potable. Given that neither Manitoba Conservation nor CCME have developed non-potable groundwater guidelines, AMEC has referenced the non-potable groundwater guidelines established by MOE.

<u>Freshwater Aquatic Life Pathway:</u> When a surface water body is located within 10 m from a property designated as fine-grained under CCME definition, protection against the discharge of impacted groundwater to the water body has to be considered in the selection of guideline criteria. Since there are no surface water bodies located within a 10 m radius of the Site, the protection of groundwater for aquatic life pathway is not applicable.

<u>Irrigation and Livestock Watering:</u> There are no sources of irrigation or livestock watering within 500 m of the Site. As such, the protection of groundwater for irrigation or livestock watering is not applicable.



Soil :

Tables D1 through D4, Appendix D summarize potential exposure pathways (Site and off-Site) and indicate the limiting pathways above and below 1.5 m. AMEC has determined that the following exposure scenarios are applicable:

At and above 1.5 m:

 vapour inhalation (slab-on-grade) and ecological soil contact as the prevailing exposure pathways.

Below 1.5 m:

• vapour inhalation (slab-on-grade) as the prevailing exposure pathway.

5.2 LAND USE DESIGNATION

Residential properties are present approximately 10 m west of the Site property boundary. However, the CCME model for vapour inhalation assumes that the impacts are present below or have the potential to migrate below the structure being assessed. Under the current Site scenario, the potential for the existing impacts to migrate to below the residential properties is considered negligible, based on the following:

- The source of impacts, comprising of four USTs, associated pumps and piping, and waste oil UST, has been removed from the Site, negating further impact origination;
- The existing impacts have been delineated on-site or immediately off-site to the east during AMEC's Intrusive Environmental Assessment; and
- Site monitoring data from 1988 to present indicates that the residential areas are upgradient of the shallow groundwater flow direction.

The zoning designations for the Site and surrounding properties are shown in Figure 2. Information regarding the land usage associated with the individual residential and commercial zoning designations is summarized in excerpts of the City of Selkirk Zoning By-Law 4968, included in Appendix E. The future use of the Site, based on the land zoning, will most likely be utilized as a commercial establishment. However, the Strip Commercial land zoning designation may also allow the development of Multi-Family Dwellings. Based on conversations with the City of Selkirk, the current vacancy rate for apartments is, and historically has been, high. A total of five apartments complexes have been developed in Selkirk since 1996, and all have been on previously undeveloped properties. As such, the probability of the Site converting to residential use is low. Therefore, guideline values were adopted employing the default parameters for commercial land use as put forward in CCME documentation.



5.3 GRAIN-SIZE DESIGNATION

Two soil samples from the environmental assessment program were submitted for grain size analysis. The results of the grain size analysis indicated that the soils were fine grained (70.0% and 60.2% passing the 75 μ m sieve, respectively). As such, the Site would considered to be fine-grained as per the CCME definition.

As well, the samples had approximately 58% and 51%, respectively, passing the 0.050 mm sieve, which equates to 42% and 49% of particles equal to or larger than 0.050 mm. Under MOE designation, a fine to medium grained material is classified as having <70% of the particles equal to or larger than 0.050 mm. Therefore, the samples are classified as fine to medium grained according to the MOE guidelines.

Details regarding the grain size analysis are discussed in Section 11.2 of this report

5.4 SUMMARY

The associated assessment guideline values based on the exposure scenarios, land use designations and soil grain size have been adopted for assessment purposes only:

Soil:

- The Tier 1 CCME commercial soil quality guidelines for surface soils (≤ 1.5 m depth) based on fine grained soils and non-potable groundwater conditions, with vapour inhalation (slabon-grade) and ecological soil contact as the prevailing exposure pathways.
- The Tier 1 or generic CCME commercial soil quality guidelines for subsurface soil (> 1.5 m depth) based on fine-grained soils and non-potable groundwater conditions, with vapour inhalation (slab-on-grade) as the prevailing exposure pathway.

Groundwater:

Non-potable groundwater criteria for fine to medium grained soils.

The referenced assessment guidelines are summarized in Table 2, appended to this report.

6.0 SITE AND AREA DESCRIPTION

6.1 SITE AND SURROUNDING LAND USE

The Site and the neighbouring properties to the north (across Rosser Avenue), south (across Pacific Avenue), and east (across Main Street) were zoned for commercial use with properties to the west zoned for residential use.

The surrounding land uses observed at the time of the test drilling program are summarized in Table 3, appended to this report, and are shown on Figure 4.



6.2 SERVICE LOCATIONS

On-site utilities servicing the kiosk/convenience store and car wash were located and disconnected by the excavation contractor in preparation of the UST removal and site structure demolition, with exception of the onsite storm water collection system. All on-site utilities; including water, sanitary sewer, MTS, and natural gas; were removed and capped by Hazco at the property boundaries. The respective utility representatives cleared each disconnection. The Manitoba Hydro overhead power line was disconnected at the hydro pole off-site to the west of the former kiosk location. Electrical, water, sewer (sanitary and storm) and natural gas main lines run parallel to the property boundary east of the Site. Sewer and water also run parallel to the property boundaries north and south of the Site and natural gas also runs parallel to the property boundaries north and south of the Site. Aboveground power and MTS lines run along the north side of the public lane (perpendicular to the west side of the Site). The locations of the remaining utilities, following decommissioning, are shown on Figure 4.

6.3 SOIL CONDITIONS

6.3.1 Local Geology

The City of Selkirk is located in the Red River floodplain, which is the historic basin of glacial Lake Agassiz in east-central Manitoba. Locally, the landform is relatively flat, with a more regional gradient towards the Red River. Based on available geological maps and water well records provided by the Water Resources Branch of Manitoba Conservation, the surficial soils in this area of Manitoba normally consist of glacio-lacustrine (Lake Agassiz) deposits consisting of clay and silt underlain by silty clay or silt till deposits. The well logs for the area of the Site also indicate that there are discontinuous sand and silt seams located immediately above the bedrock. Bedrock was not encountered during the intrusive environmental assessment. Available maps indicate that the underlying bedrock in this area of the province is of the Red River Formation and largely consists of dolomite and limestone with minor shale interbeds. Bedrock is estimated to occur at depths greater than 25 m below grade.

6.3.2 Stratigraphy

General soil conditions observed at the UST nest excavation sidewalls and test hole locations consisted of granular or clay fill up to depths of 1.5 m below grade. The fill materials were underlain by high plastic clay that extended to depths of between 3.4 m to 5.2 m below grade. Glacial till was present below the high plastic clay to the termination depth of the test holes. Exceptions to the general stratigraphy were observed in test pit locations conducted at the pump islands and historical UST nest locations, in which fill materials extended up to 2.4 m.

Seepage and sloughing was not encountered in any of the test holes, at the completion of drilling and prior to monitoring well installation.



The subsurface soil stratigraphy encountered at the test pit and test hole locations is summarized in detail on the logs in Appendix B.

6.4 GROUNDWATER CONDITIONS

6.4.1 Regional Hydrogeology

The Site was relatively flat lying and slightly elevated as compared to the adjacent streets. Surface drainage appeared to be directed to municipal catchbasins located on the Site and along the adjacent roadways. The general topography of the area surrounding the Site appeared to be slightly sloped towards the Red River located to the east.

Fractured zones in the bedrock comprise the major aquifer, which is employed mainly for industrial purposes in the Selkirk area. While there are zones of perched groundwater located in the silts and clays overlying the bedrock, these groundwater zones are discontinuous and not of usable quality.

As a result of the low to moderately permeable soils overlying the bedrock aquifer in the Selkirk area, the area of the Site has not been identified as a groundwater pollution hazard area as per the Department of Mines, Resources and Environmental Management's Ground Water Pollution Hazard Map (Province of Manitoba, 1978).

7.0 LEGAL SITE SURVEY

Prior to conducting the legal survey, Pollock and Wright conducted a search of the Certificate of Title to determine the legal boundaries of the Site. During the legal survey on 25 August 2004, Pollock and Wright located the corner property pins and marked the Site property boundaries. A copy of the legal site survey plan is included in Appendix A.

8.0 PRELIMINARY SITE MONITORING PROGRAM

The results of the Preliminary Site Monitoring, conducted on 30 June 2004, are summarized in Table 4. Monitoring wells installed at the Site from previous investigations and not reported as destroyed in past monitoring events by others included:

- BH1, BH4, BH9, BH10, BH11
- PZ12, PZ13, PZ15, PZ16, PZ22, PZ27, PZ28, PZ29, PZ30, PZ31
- RW1, RW2
- MW32, MW33, MW34, MW35, MW36, MW37, MW38

Of these wells, only BH1, BH9 through BH11, PZ28 through PZ31, and MW32 through MW38 could be located. PZ15 was located but observed to be infilled with gravel.



A maximum well headspace vapour concentration of 80 ppm_v was measured in MW32 and a maximum groundwater headspace vapour concentration of 5 %LEL was measured in MW36. No free product was apparent on the groundwater surface.

8.1 LABORATORY RESULTS - GROUNDWATER

The results of the groundwater laboratory analyses are summarized in Table 5 and shown on Figure 11. Copies of the detailed analytical reports are provided in Appendix C.

The dissolved PHC concentrations of the groundwater samples submitted for analysis during the preliminary monitoring were below the non-potable assessment criteria.

9.0 UST REMOVAL PROGRAM

9.1 UST CONDITIONS AND EXCAVATION LIMITS

AMEC's field personnel arrived at the Site on 12 July 2004, to witness the removal of the four 22750 L USTs from the Site. Prior to removal, the USTs were air purged. AMEC observed the air purging for one UST. All the USTs were extracted from the UST nest on 12 July 2004. The USTs were observed to be in good condition with no visible perforations aside from damage incurred during removal.

After removal from the UST nest, each UST was then destroyed onsite and the debris transported offsite for disposal. A copy of the contractor's certificate of assurance regarding the destruction of the USTs is included in Appendix F.

The UST nest excavation had dimensions of approximately 12.4 m by 12.6 m at grade and was approximately 3.2 m deep. The excavation was backfilled with the excavated material and imported pit run gravel and topped with crushed limestone. The boundary between the excavated material fill and imported clean fill was demarked by the placement of snow fence sections. The final extent of the excavation is shown on Figure 5.

Photographs taken at the time of the UST removal are appended to this submission.



9.2 SOIL MONITORING AND SAMPLING

The backfill material covering and surrounding the USTs consisted of pea gravel.

Soil monitoring and sampling activities were conducted on 13 July 2004 following the removal of the USTs. The general profile along the excavation sidewalls consisted of asphalt pavement and up to 1.2 m of granular and clay fill followed by high plastic native clay, which extended to the base of the excavation. The southeast portion of the UST nest excavation overlapped the historical UST nest. As such, the sidewalls in the southeastern corner did not extend to native soils. Native clay was present at the base of the excavation.

Soil vapours concentrations ranging from 5 ppm_v to >100% LEL were detected and PHC staining was observed on all four sidewalls and at the base of the UST excavation. The measured soil vapour concentrations in the UST backfill material ranged from 5 to 120 ppm_v. ATH vapour concentrations measured during the UST removal activities are shown on Figure 6.

9.3 LABORATORY RESULTS

After reviewing the ATH vapour test results, a total of ten soil samples were submitted for laboratory analysis of BTEX, F1-F4, and lead. Samples representative of each of the excavation sidewalls and base were submitted for analysis. The results of the analytical testing are presented in Table 6 and summarized in Figure 6, along with the applicable guidelines for comparison. The laboratory certificates of analysis are included in Appendix C.

The following soil samples had concentrations of PHC constituents above the current CCME (1999, updated 2003) referenced guidelines:

- S3 (2.1 m) –xylenes (21 μg/g);
- E20 (2.8 m) ethylbenzene (27 μg/g), xylenes (160 μg/g);
- WF2 (3.2 m) –xylenes (18 μg/g);
- WF3 (3.2 m) –xylenes (23 μg/g).

There were no exceedances of the CCME PHC (2001) referenced guidelines.

10.0 TEST PITTING PROGRAM

Test pitting was conducted on 16 July 2004. The locations of the test pits were chosen based on probable impacts origination; including below the four pump vaults, in the vicinity of the car wash sump, and in the area of the historical UST nest.



10.1 FIELD OBSERVATIONS AND TEST PIT SOIL VAPOUR CONCENTRATIONS

Soil vapour concentrations and field observations made during the test pit program are summarized on the test hole logs in Appendix B. The locations of the test holes are shown in Figure 7.

Staining was observed in TP06, within the historical UST nest, at depths ranging between 1.2 m and 3.2 m below grade, and at TP02, beneath the northwestern pump, at depths ranging between 1.5 and 2.4 m. A maximum soil vapour concentration of greater than 100% LEL (>12000 ppm_v) was identified in TP06 at a depth of 2.4 m below grade. Vapour concentrations in excess of 500 ppm_v were measured at TP06 (1.5 m to 3.1 m) and TP02 (2.4 – 3.1 m). The soil vapour concentrations at the remaining test pit locations were at or below 25 ppm_v.

10.2 LABORATORY RESULTS

The results of the PHC laboratory analysis conducted on the selected soil samples are presented in Table 7 and are summarized in comparison to the applicable guideline on Figure 8. Copies of the detailed analytical reports are provided in Appendix C.

The following soil samples had concentrations of PHC constituents above the current CCME (1999, updated 2003) referenced guidelines:

- TP02 at 2.4 m xylenes (18 μg/g);
- TP06 at 2.4 m ethylbenzene (21 μg/g) and xylenes (150 μg/g);
- TP06 at 3.7 m benzene (8.5 μg/g) and xylenes (30 μg/g).

There were no exceedances of the CCME PHC (2001) referenced guidelines.

11.0 INTRUSIVE ASSESSMENT PROGRAM

The test hole drilling program was conducted from 4 to 6 August 2004. A total of 10 test holes, were completed as monitoring wells.

Photographs taken at the time of the intrusive assessment are appended to this submission.

11.1 FIELD OBSERVATIONS AND TEST HOLE SOIL VAPOUR CONCENTRATIONS

Soil vapour concentrations and field observations made during the test hole drilling program are summarized on the test hole logs in Appendix B. The locations of the test holes are shown in Figure 7.

Staining was observed in 04-01 at depths between 2.9 and 3.2 m as well as 3.7 and 4.3 m below grade. A maximum soil vapour concentration of 500 ppm, was identified in 04-01 at depths of



3.1-3.8 m below grade. The soil vapour concentrations at the remaining test hole locations were at or below 150 ppm_v.

11.2 GRAIN SIZE ANALYSIS

Soil samples from TH4 at 1.5 m depth (clay) and 6.9 m depth (till) were submitted for grain size analysis. The resulting analysis indicates that the samples had 70.0% and 60.2%, respectively, passing the 0.075 sieve. Given that the median grain sizes were both less than 75 μ m, the samples are considered to be fine grained as per the CCME definition. In addition, >30% of the material had a particle size less than 0.050 mm, classifying the samples as fine to medium grained according to the MOE guidelines. A coarse grained material is classified by MOE as one having <70% of the particles equal to or larger than 0.050 mm.

The results of the grain size analysis are included in Appendix G.

11.3 LABORATORY RESULTS - SOIL

The results of the laboratory analysis conducted on the selected soil samples are presented in Table 8 and 9 and the PHC concentrations are summarized in comparison to the applicable guideline on Figure 9. Copies of the detailed analytical reports are provided in Appendix C.

There were no exceedances of the current CCME (1999, updated 2003) or CCME PHC (2001) referenced guideline for PHCs, metals, PAH's and glycol in the soil samples submitted for analysis.

11.4 RETURN MONITORING

The results of the Site monitoring, conducted on 30 August 2004, are summarized in Table 4.

A maximum well headspace vapour concentration within all monitoring wells and within just the newly installed monitoring wells was 80 ppm, measured in MW36 and 50 ppm, measured in 04-05, respectively. Groundwater vapour concentrations did not exceed 170 ppm, in any monitoring well. The groundwater gradient and flow direction was towards the southeast (equating to "True South") based on the Site monitoring conducted on 30 August 2004. Free product was not observed at the monitoring well locations. The groundwater elevations in all of the monitoring wells at the time of the monitoring event, as well as the flow direction are shown on Figure 10, appended to this report.

11.5 LABORATORY RESULTS - GROUNDWATER

The results of the PHC laboratory analysis conducted on the groundwater samples are summarized in Table 5 and on Figure 12. Copies of the detailed analytical reports are provided in Appendix C.



All groundwater samples submitted for PHC analysis had concentrations below the MOE non-potable referenced guidelines.

11.6 HYDRAULIC CONDUCTIVITY

Hydraulic conductivity testing, employing the falling head (slug) technique and interpreting the results with the Hvorslev method, was conducted at 04-03 (well completed in clay) and 04-06 (well completed in till). The calculated results of the tests indicated hydraulic conductivities are 3.2×10^{-6} cm/sec and 2.6×10^{-7} cm/sec, respectively. A geometric average hydraulic conductivity was not calculated as two separate stratiographic units were tested. As such, a default value for near surface groundwater bulk hydraulic conductivity is assumed to be the clay calculated value of 3.2×10^{-6} cm/sec.

The calculated bulk hydraulic conductivity at the Site is less than the 10⁻⁴ cm/s defined by the CCME as indicating a sustainable yield for a potable drinking water source.

Copies of the hydraulic conductivity test results and interpretation are included in Appendix H.

12.0 FIELD AND LABORATORY QA/QC

Laboratory and field duplicates as well as field and travel blanks were analyzed during this project. The results were compared to IOL's acceptance criteria and are summarized in the following sections.

Soil

One blind field duplicate sample was analyzed and the relative percent difference (RPD) between the respective original samples was within IOL's acceptance criteria for BTEX, and F1 to F4.

The field blank analytical results from the drilling program detected benzene (0.005 μ g/g) at 5 x detection limit and is just below IOL's alert limit. Ethylbenzene (0.008 μ g/g) was also detected in the field blank, but at <5 x detection limit. Based on PSC's reported QA/QC results, it is AMEC's opinion that the soil laboratory data is reliable.

Groundwater

Travel and field blank analytical results for BTEX and PHC were in accordance with IOL's acceptance criteria. Field duplicates were analyzed and found to have a relative percent difference within IOL's acceptance criteria. Based on PSC's reported QA/QC results, it is AMEC's opinion that the groundwater laboratory data is reliable.

Laboratory

The soil matrix spike sample recovery from TP06 at 3.7 m depth for benzene and toluene were reported as 200 %, exceeding the IOL acceptance criteria. A DQW was issued citing high



concentration of BTEX as the reason for deviation. A laboratory control soil sample (spiked blank sample) percent recovery for ethylbenzene from the 4 to 6 August 2004 drilling program was reported as 47 %, outside the IOL acceptance criteria. A DQW has been requested for this sample. A second laboratory control soil sample (spiked blank sample) percent recovery for toluene from the 13 July 2004 UST removal program was reported as 41 %, however, the spike concentration (0.043 μ g/g) was <2 x the blank concentration (0.026 μ g/g). The matrix duplicate soil sample for TP04 at 1.8 m depth had a RPD of 52.17 %, however, the sample and duplicate concentrations were <5 x detection limit.

Method blank analysis on soil blanks detected benzene (0.002 μ g/g), toluene (0.026 μ g/g), and ethylbenzene (0.006 μ g/g) during the UST removal program; benzene (0.002 μ g/g), toluene (0.026 μ g/g), ethylbenzene (0.006 μ g/g), and F1 (11 μ g/g) during the test pitting program; and benzene (0.003 μ g/g) and ethylbenzene (0.007 μ g/g) during the drilling program. All concentrations were within IOL's acceptance criteria (<5 x detection limit).

All groundwater blank and matrix spikes, lab duplicates and their surrogates were within IOL's acceptance criteria. AMEC considers all laboratory data to be reliable.

13.0 SUMMARY AND CONCLUSIONS

AMEC was retained by Mr. Andrew Hodgetts, P.Eng. of IOL to conduct an environmental assessment of a former automotive retail station located at 287 Main Street in Selkirk, Manitoba.

A legal survey to determine the Site legal property limits was subcontracted to Pollock & Wright Land Surveyors and was conducted on 25 August 2004.

A preliminary monitoring of accessible existing monitoring wells was conducted on 30 July 2004. Sixteen of the 24 monitoring wells not previously reported as destroyed were located and monitored as part of the preliminary program. A maximum well headspace vapour concentration of 80 ppm, was measured in MW32 and a maximum groundwater headspace vapour concentration of 5 %LEL was measured in MW36. No free product was apparent on the groundwater surface.

A UST removal program, in which AMEC's involvement occurred on 12 and 13 July 2004 was conducted as part of the Site facility and structure decommissioning. Following removal of the USTs from the Site, soil samples were collected from the excavated soils, from the final excavation walls and from the base for field testing. Soil vapours concentrations ranging from 5 ppm, to >100% LEL were detected and petroleum hydrocarbon (PHC) staining was observed on all four sidewalls and at the base of the UST excavation. The measured soil vapour concentrations in the UST backfill material ranged from 5 to 120 ppm,. Ten soil samples were selected for laboratory analysis, in which the concentration of select BTEX constituents in soil samples obtained from the southern and eastern sidewalls and base of the UST nest (S3, E20, WF2, and WF3) were in excess of referenced criteria.



A test pitting program was conducted on 16 July 2004. Six test pits were advanced at probable impacts origination locations. Staining was observed in TP06, within the historical UST nest, at depths ranging between 1.2 and 3.2 m below grade, and at TP02, beneath the northwestern pump, at depths ranging between 1.5 and 2.4 m. A maximum soil vapour concentration of greater than 100% LEL (>12000 ppm_v) was identified in TP06 at a depth of 2.4 m below grade. Vapour concentrations in excess of 500 ppm_v were measured at TP06 (1.5 to 3.1 m) and TP02 (2.4 to 3.1 m). The soil vapour concentrations at the remaining test pit locations were at or below 25 ppm_v. A total of eight soil samples were selected for laboratory analysis, in which the concentration of select BTEX constituents in soil samples obtained from TP02 (2.4 m depth) and TP06 (2.4 and 3.7 m depth) were in excess of referenced criteria.

A test hole drilling program was conducted from 4 to 6 August 2004 and consisted of a total of 10 test holes (04-01 to 04-10), with the installation of monitoring wells in each test hole. General soil conditions at the test hole locations consisted of granular or clay fill up to depths of 1.5 m below grade. The fill materials were underlain by high plastic clay that extended to depths between 3.4 and 5.2 m below grade. Glacial till was present below the high plastic clay to the termination depth of the test holes.

Staining was observed in 04-01 at depths between 2.9 and 3.2 m as well as 3.7 and 4.3 m below grade. A maximum soil vapour concentration of 500 ppm $_{\rm v}$ was identified in 04-01 at depths of 3.1 – 3.8 m below grade. The soil vapour concentrations at the remaining test hole locations were at or below 150 ppm $_{\rm v}$.

Eighteen soil samples (including one duplicate and field blank) obtained during the intrusive assessment were submitted for analysis of BTEX, F1 to F4, select metals, select PAH's, and/or glycols. An additional two samples were submitted for grain size analysis. All samples submitted for analysis did not contain the above constituents in excess of the referenced guideline. Grain size analysis confirmed that the soils are classified as fine-grained by both the CCME and MOE definitions.

Groundwater levels were measured approximately three weeks following installation of the new monitor wells. A maximum well headspace vapour concentration of 80 ppm, was measured in MW36 and 50 ppm,. The highest well headspace vapour concentration in the wells installed during the August 2004 intrusive investigation was 50 ppm, measured in 04-05. Groundwater vapour concentrations did not exceed 170 ppm, in any monitoring wells. The groundwater flow direction based on the Site monitoring conducted on 30 August 2004 was to the southeast.

Groundwater samples were obtained from the new wells and from those wells that were not sampled during the preliminary monitoring program, as well as from one well (BH10) sampled from the preliminary monitoring program to provide correlation between the two events. All groundwater samples submitted for PHC analysis had concentrations below the MOE non-potable referenced guidelines. Hydraulic conductivity testing performed during the return



monitoring indicate that the clay and clay till at the Site have conductivity values of 3.2×10^{-6} cm/sec and 2.6×10^{-7} cm/sec, respectively.



14.0 REFERENCES

- Canadian Council of Ministers of the Environment (CCME). 1999. Canadian Environmental Quality Guidelines.
- Canadian Council of Ministers of the Environment (CCME). 2001. Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil.
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- Ministry of Environment and Energy in Ontario. 1999. Guideline for Use at Contaminated Sites in Ontario.



15.0 LIMITATION OF LIABILITY, SCOPE OF REPORT AND THIRD PARTY RELIANCE

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Prepared by:

AMEC Earth & Environmental

Michael Bertram, P.Eng

Senior Environmental Engineer, Winnipeg Operations

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Reviewed by:

Mark Humbert, 19. Eng.

Manager, Saskatoon Operations





Table 1: Summary of Laboratory Analysis

Matrix	Number of Samples ¹	Type of analysis
Soil (UST removal)	10	BTEX, F1-F4, Lead
Soil (test pitting)	8 .	BTEX, F1-F4, Lead
	14	BTEX, F1-F4, Lead
Soil (intrusive	2	Grain Size Analysis
assessment)	2	Metals, Glycol
	2	PAH's
Groundwater (preliminary)	10	BTEX, F1-F2, Lead
Groundwater (return)	16	BTEX, F1-F2, Lead

Notes:

Table 2: Referenced Soil Tier I and Generic Guidelines and Non-Potable Groundwater Guidelines for Fine Grained Soil, Commercial Land Use

Analytical Parameters	Surface soil ¹ 0-1.5 m below grade mg/kg	Subsoil ² >1.5 m below grade mg/kg	Groundwater μg/L
Benzene	5	5	12000
Toluene	14	14	37000
Ethylbenzene	20	20	50000
Xylenes	17	17	35000
Lead	260	260	NG
PHC-F1	660	4800	NG
PHC-F2	1500	26000	NG
PHC-F3	2500	NG	NA
PHC-F4	6600	NG	NA
Arsenic	.12	12	NA
Barium	2000	2000	NA
Chromium	87	87	NA
Copper	91	91	NA
Lead	260	260	, NA
Zinc	360	360	NA
Benzo(a)pyrene	1.4	1.4	NA
Naphthalene	22	22	, NA
Ethylene Glycol	1800	1800	NA
Diethylene Glycol	NG	NG	NA
Propylene Glycol	NG	NG	NA

Notes:

NA - not analyzed

NG - no guideline available for reference

¹ Applicable pathway: Ecological soil contact

² Applicable pathway: Vapour inhalation

PHC – F1: fractional petroleum hydrocarbon C_6 - C_{10} ; corrected for BTEX

PHC – F2: fractional petroleum hydrocarbon C₁₀-C₁₆

PHC – F3: fractional petroleum hydrocarbon C₁₆-C₃₄

PHC - F4: fractional petroleum hydrocarbon C₃₄-C₅₀₊

^{1 -} including all QA/QC samples



Table 3: Surrounding Land Use

Direction		Approx Distance (m)
Site	Vacant (at the time of intrusive assessment)	·
West	Public lane followed by single family residences	Adjacent/5 m
North	Rosser Avenue followed by partially occupied strip mall	Adjacent/20 m
South	Pacific Avenue followed by Co-op Gas Bar	Adjacent/20 m
East	Main Street followed by mixed commercial/multi-family residential	Adjacent/60 m



Table 4: Summary Of Groundwater Monitoring

Monitor No.	Ground Elevation (m)	Top of Pipe Elevation (m)	Depth to Water (m B.TOP)	Free Product Thickness (mm)	Ground Water Elevation (m)	Combustible Vapours Well Headspace	Combustible Vapours Ground-water Headspace
			30 J	UNE 2004			
BH1	99.32	99.40	1.64	ND	97.68	NM	<5 ppm _v
BH9	98.98	98.92	1.31	ND	98.67	35 ppm _v	<5 ppm _v
BH10	99.02	98.90	1.24	ND	97.78	20 ppm _v	100 ppm _v
BH11	99.02	98.94	1.23	ND	97.79	75 ppm _v	<5 ppm _v
MW32	99.57	99.51	1.84	ND	97.73	80 ppm _v	10 ppm _v
MW33	99.60	99.53	1.92	ND	97.68	25 ppm _v	10 ppm _v
MW34	99.32	99.24	1.43	ND	97.89	30 ppm _v	350 ppm _v
MW35	99.53	99.46	1.88	ND	97.65	50 ppm _v	150 ppm _v
MW36	99.42	99.32	1.99	ND	97.43	<5 ppm _v	5% LEL
MW37	99.72	99.62	2.07	ND	97.65	75 ppm _v	240 ppm _v
MW38	NM	NM	1.63	ND	NM	25 ppm _v	<5 ppm _v
PZ28	99.45	99.30	1.73	ND	97.72	<5 ppm _v	25 ppm _v
PZ29	99.51	99.38	1.80	ND	97.71	25 ppm _v	25 ppm _v
PZ30				Inaccessible			
PZ31	99.66	99.46	1.88	ND	97.78	<5 ppm _v	10 ppm _v
			30 AL	IGUST 2004			
04-1	99.22	99.15	1.78	ND	97.37	<5 ppm _v	<5 ppm _v
04-2	99.48	99.56	1.36	ND	98.13	20 ppm _v	<5 ppm _v
04-3	99.55	99.89	1.71	ND	97.84	5 ppm _v	<5 ppm _v
04-4	99.60	99.65	0.64	ND	98.96	5 ppm _v	<5 ppm _v
04-5	98.85	98.98	2.68	ND	96.17	50 ppm _v	25 ppm _v
04-6	99.67	99.97	2.42	ND	97.25	<5 ppm _v	<5 ppm _v
04-7	99.52	99.70	1.18	ND	98.35	<5 ppm _v	<5 ppm _v
04-8	99.61	99.73	3.51	ND	96.10	5 ppm _v	<5 ppm _v
04-9	98.83	98.97	2.76	ND	96.07	25 ppm _v	30 ppm _v
04-10	99.31	99.41	1.34	ND	97.97	<5 ppm _v	<5 ppm _v
BH1	99.32	99.40	1.52	ND	97.88	NM	<5 ppm _v
ВН9	98.98	98.92	1.05	ND	97.87	35 ppm _v	25 ppm _v
BH10	99.02	98.90	1.26	ND	97.64	50 ppm _v	170 ppm _v
BH11	99.02	98.94	1.00	ND	97.94	15 ppm _v	45 ppm _v
MW32	99.57	99.51	1.81	ND	97.70	50 ppm _v	<5 ppm _v
MW33	99.60	99.53	2.27	ND	97.26	55 ppm _v	<5 ppm _v
MW35	99.53	99.46	2.08	ND	97.38	<5 ppm _v	<5 ppm _v
MW36	99.42	99.32	1.99	ND	97.33	80 ppm _v	<5 ppm _v
MW37	99.72	99.62	2.54	ND	97.08	75 ppm _v	5 ppm _v
MW38	NM	NM	1.51	ND	NM	<5 ppm _v	<5 ppm _v

- m B.TOP metres below top of well pipe
- ppm_v / %LEL parts per million / percent lower explosive limit
- ND not detected
- NM not monitored
- Elevations based on relative elevation established for a benchmark (top nut of fire hydrant near SE corner of Site) of 100.00 m.



Table 5: Summary Of Laboratory Testing - Groundwater Samples

				, ,				
Sample Location	Groundwater Vapour Concentration	Benzene	Toluene	Ethyl- Benzene	Xylenes	PHC F1 mg/L	PHC F2 mg/L	Lead ¹ mg/L
			JUNE	2004				
MW32	10 ppm _v	<0.5	<0.5	<0.5	<0.5	<0.1 `	<0.1	<0.0005
MW33	10 ppm _v	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.0005
MW34	350 ppm _v	6000	3500	370	2600	3.6	0.3	<0.0005
MW36	5% LEL	4200	52	250	270	1.0	0.2	<0.0005
MW37	240 ppm _v	1100	37	290	380	1.2	0.3	< 0.0005
MW38	<5 ppm _v	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.0005
BH10	100 ppm _v	490	4.4	57	31	1.6	0.3	<0.0005
Duplicate	100 ρριτίν						***************************************	
(MW34)		4600	2500	220	1700	<0.1	NA	NA
Field Blank		<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	NA
Travel Blank		<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	NA
			AUGUS	ST 2004				
04-1	<5 ppm _v	510	<5.0 ¹	29	36	<0.1	0.1	0.0033
04-2	<5 ppm _v	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.0005
04-3	<5 ppm _v	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	< 0.0005
04-4	<5 ppm _v	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	0.0016
04-5	25 ppm _v	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.0005
04-6	<5 ppm _v	<0.5	<0.5	<0.5	0.5	<0.1	<0.1	< 0.0005
04-7	<5 ppm _v	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	< 0.0005
04-8	<5 ppm _v	59	<0.5	7.8	6.4	0.1	<0.1	<0.0005
04-9	30 ppm _v	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.0005
04-10	<5 ppm _v	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	0.0010
BH9	25 ppm _v	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	< 0.0005
BH10	170 ppm _v	370	8.4	82	46	1.3	0.6	< 0.0005
BH11	45 ppm _v	8.6	<0.5	<0.5	<0.5	<0.1	<0.1	0.0011
Duplicate (04-2)		<0.5	<0.5	<0.5	<0.5	<0.1	NA	NA
Field - Blank		<0.5	<0.5	<0.5	<0.5	<0.1	NA	NA
Travel Blank		<0.5	<0.5	<0.5	<0.5	<0.1	NA	NA
MOE Criteria fo groundwater sit grained soils	r a Non-potable tuation for fine	12000	37000	50000	35000	NA	NA	NA ³

- Groundwater sample headspace vapour concentration measured with a Gastech Model 1238ME vapour analyzer, calibrated to hexane with methane exclusion.
- all concentrations in micrograms per litre (μg/L) except where noted
- TPH refers to Total Petroleum Hydrocarbons (C5-C30) and is the summation of Light Hydrocarbons (C5-C10) and Total Extractable Hydrocarbons (C10-C30).
- < less than the analytical detection limit
- NA not applicable/no guideline criteria established
- 1 Lead concentrations are reported as dissolved concentration
- 2 MDL raised due to sample dilution
- Not applicable as the guideline value is based on potential environmental impacts of impacted groundwater to surface water. Since this pathway is not applicable the guideline value is also not applicable.
- Not tested.
- Bold and underlined indicates constituent concentration exceeds the applicable criteria.
- MOE Criteria

 Non-potable groundwater criteria for fine-grained soils as outlined in the 1997 (reissued in 1999). Ontario Ministry of the Environment publication; Guideline for Use at Contaminated Sites in Ontario.
- See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis
 was performed by Philip Analytical Services.



Table 6: Summary of Laboratory Testing – Soil Samples (UST Removal Program)

CCME Comme	roial CWS PH	C fine gra	ined subsoi	le ³ />1 5m d	enth helow	grade)	4800	26000	NA	NA
CCME Comme	rcial EQG	5	14 ¹	20	17	260²		N	A	
WF3	350 ppm _v	0.40	0.28	4.3	23	14.4	160	<50	<50	<50
WF2	150 ppm _v	1.6	3.3	6.2	<u>18</u>	14.5	380	170	<50	<50
EF4	100 ppm _v	0.077	0.12	0.40	2.1	15.4	33	<50	<50	<50
EF1	10% LEL	0.037	0.055	0.52	1.8	11.0	41	<50	<50	<50
W12	55% LEL	0.062	0.037	1.4	1.5	15.1	51	<50	<50	<50
S3	>100% LEL	1.4	0.72	8.2	<u>21</u>	14.1	290	110	<50	<50
N20	>100% LEL	0.31	1.1	2.8	13	15.9	93	<50	<50	<50
N7	>100% LEL	1.1	0.32	5.0	11	13.0	120	100	<50	<50
E20	>100% LEL	0.32	3.1	<u>27</u>	160	2.3	2400	970	130	<50
E17	250 ppm _v	0.002	0.018	0.004	<0.1	2.0	<10	<50	<50	<50
Sample Location (Depth in m)	Soil Vapour Conc.	Benzene	Toluene	Ethyl Benzene	Xylenes	Lead	PHC F1	PHC F2	PHC F3	PHC F4

- Soil sample headspace vapour concentration measured with a Gastech Model 1238ME vapour analyzer, calibrated to hexane with methane exclusion
 - ppm_v parts per million
 - all concentrations in micrograms per gram (ug/g)
 - VPH (F1) volatile petroleum hydrocarbons (C6 C10); corrected for BTEX concentrations
 - EPH (F2) extractable petroleum hydrocarbons (C10 C16)
 - EPH (F3) extractable petroleum hydrocarbons (C16 C34)
 - EPH (F4) extractable petroleum hydrocarbons (C34 C50)
 - F2, F3, F4 concentrations reported have not been corrected for inclusion of PAH. Based on AMEC's understanding
 of the site history, PAH concentrations are expected to be insignificant compared to the extractable petroleum
 hydrocarbon concentration as a whole and therefore have not been analyzed separately.
 - 1 Toluene guideline revised to reflect lack of groundwater as domestic consumption pathway.
 - ² Tier I guideline based on soil ingestion
 - 3 Generic guideline for vapour inhalation (slab-on grade) pathway at a commercial land use
 - < less than the analytical detection limit
 - NA not applicable
 - Bold and underlined indicates constituent concentration exceeds the applicable guideline.
 - CCME EQG Guideline commercial land use guideline as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999.
 - CCME CWS PHC Guideline commercial land use guideline as outlined in the Canadian Council of the Ministers
 of the Environment (CCME) "Canada-Wide Standards for Hydrocarbons in Soil", 2000.
 - See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by Philip Analytical Services.



Table 7: Summary of Laboratory Testing – Soil Samples (Test Pitting Program)

Sample	Soil			* E	1645 15 15		DUG	PHC	PHC	PHC
Location	Vapour	Benzene	Toluene	Ethyl	Xylenes	Lead	PHC			
(Depth in m)	Conc.			Benzene			F1	F2	F3	F4
TP1 @ 3.1m	10 ppm _v	0.005	0.039	0.024	<0.1	NA	<10	<50	<50	<50
TP2 @ 2.4m	33% LEL	0.18	<0.10 ¹	5.0	<u>18</u>	NA	540	190	<50	<50
TP2 @ 3.7m	60 ppm _v	0.50	0.026	0.57	<0.1	NA	34	<50	<50	<50
TP3 @ 3.4m	10 ppm _v	0.005	0.030	0.008	<0.1	NA	<10	<50	<50	<50
TP4 @ 1.8m	25 ppm _v	0.002	0.029	<0.003	<0.1	NA	<10	<50	<50	<50
TP5 @ 3.1m	5 ppm _v	0.008	0.049	0.014	<0.1	NA	<10	<50	<50	<50
TP6 @ 2.4m	>100% LEL	1.4	12	<u>21</u>	<u>150</u>	NA	1800	1200	<50	<50
TP6 @ 3.7m	275 ppm _v	8.5	18	4.9	30	NA	190	<50	<50	<50
CCME Comme	CME Commercial EQG		14 ¹	20	17	260²		N	A	
CCME Comme	rcial CWS PH	IC – fine grai	ned subsoi	ls³ (>1.5m de	epth below	grade)	4800	26000	NA	NA

- Soil sample headspace vapour concentration measured with a Gastech Model 1238ME vapour analyzer, calibrated to hexane with methane exclusion
- ppm, parts per million
- all concentrations in micrograms per gram (ug/g)
- VPH (F1) volatile petroleum hydrocarbons (C6 C10); corrected for BTEX concentrations
- EPH (F2) extractable petroleum hydrocarbons (C10 C16)
- EPH (F3) extractable petroleum hydrocarbons (C16 C34)
- EPH (F4) extractable petroleum hydrocarbons (C34 C50)
- F2, F3, F4 concentrations reported have not been corrected for inclusion of PAH. Based on AMEC's understanding of the site history, PAH concentrations are expected to be insignificant compared to the extractable petroleum hydrocarbon concentration as a whole and therefore have not been analyzed separately.
- 1 Toluene guideline revised to reflect lack of groundwater as domestic consumption pathway.
- ² Tier I guideline based on soil ingestion
- 3 Generic guideline for vapour inhalation (slab-on grade) pathway at a commercial land use
- < less than the analytical detection limit
- NA not applicable
- Bold and underlined indicates constituent concentration exceeds the applicable guideline.
- CCME EQG Guideline commercial land use guideline as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999.
- CCME CWS PHC Guideline commercial land use guideline as outlined in the Canadian Council of the Ministers
 of the Environment (CCME) "Canada-Wide Standards for Hydrocarbons in Soil", 2000.
- See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by Philip Analytical Services.



Table 8: Summary of Laboratory Testing – Soil Samples (Intrusive Investigation Program)

Sample Location	Soil Vapour	Benzene	Toluene	Ethyl	Xylenes	Lead	PHC	PHC	PHC	PHC
(Depth in m)	Conc.	DONEONO	10,000,0	Benzene	, y, o, i, o		F1	F2	F3	F4
04-9 (1.5)	30 ppm _v	0.004	<0.010	0.007	<0.1	9.8	<10	<50	<50	<50
04-10 (0.8)	50 ppm _v	0.004	<0.010	0.006	<0.1	18.3	<10	<50	<50	<50
CCME Commer	cial EQG	5	14¹	20	17	260²		N	Α	
CCME Commer grade)	cial CWS PH	C – fine grai	ined surface	e soils³ (≤1.5	m depth be	low	660	1500	2500	6600
04-1 (3.8)	500 ppm _v	1.4	0.094	2.5	2.3	11.8	65	<50	<50	<50
04-1(4.6)	40 ppm _v	0.12	<0.010	0.037	<0.1	4.5	<10	<50	<50	<50
04-2(1.5-2.3)	30 ppm _v	0.006	<0.010	0.009	<0.1	12.4	<10	<50	<50	<50
04-3 (3.1-3.8)	25 ppm _v	0.006	<0.010	0.008	<0.1	13.2	<10	<50	<50	<50
04-4 (2.3-3.1)	40 ppm _v	0.005	<0.010	0.008	<0.1	12.1	<10	<50	<50	<50
04-5 (3.1-3.8)	40 ppm _v	0.008	<0.010	0.008	<0.1	10.1	<10	<50	<50	<50
04-6 (6.9)	75 ppm _v	0.003	<0.010	0.005	<0.1	3.5	<10	<50	<50	<50
04-7 (2.3-3.1)	30 ppm _v	0.006	<0.010	0.007	<0.1	12.2	<10	<50	<50	<50
04-8 (4.6)	150 ppm _v	1.3	0.094	0.34	1.1	12.9	77	<50	<50	<50
04-8 (5.3)	50 ppm _v	0.25	<0.010	0.13	<0.1	7.7	<10	<50	<50	<50
Duplicate 3 (04-1 at 3.8)		1.6	0.024	2.3	2.1	12.0	64	<50	<50	<50
Field Blank		0.005	<0.010	0.008	<0.1	1.8	<10	<50	<50	<50
CCME Commer	cial EQG	5	14 ¹	20	17	260²		N	Α	
CCME Commer	cial CWS PH	C – fine grai	ned subsoi	ls⁴ (>1.5m de	epth below	grade)	4800	26000	NA	NA

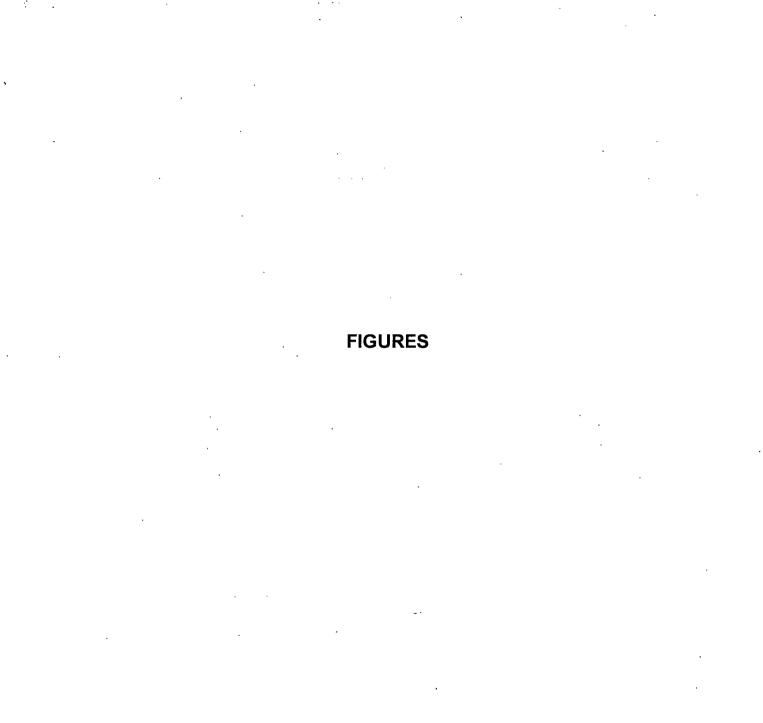
- Soil sample headspace vapour concentration measured with a Gastech Model 1238ME vapour analyzer, calibrated to hexane with methane exclusion
- ppm_v parts per million
- % LEL percent lower explosive limit
- all concentrations in micrograms per gram (ug/g)
- VPH (F1) volatile petroleum hydrocarbons (C6 C10); corrected for BTEX concentrations
- EPH (F2) extractable petroleum hydrocarbons (C10 C16)
- EPH (F3) extractable petroleum hydrocarbons (C16 C34)
- EPH (F4) extractable petroleum hydrocarbons (C34 C50)
- F2, F3, F4 concentrations reported have not been corrected for inclusion of PAH. Based on AMEC's understanding of the site history, PAH concentrations are expected to be insignificant compared to the extractable petroleum hydrocarbon concentration as a whole and therefore have not been analyzed separately.
- 1 Toluene guideline revised to reflect lack of groundwater as domestic consumption pathway.
- ² Tier I guideline based on soil ingestion
- 3 Tier I guideline for ecological soil contact pathway at a commercial land use
- 4 Generic guideline for vapour inhalation (slab-on grade) pathway at a commercial land use
- < less than the analytical detection limit
- NA not applicable
- Bold and underlined indicates constituent concentration exceeds the applicable guideline.
- CCME EQG Guideline commercial land use guideline as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999.
- CCME CWS PHC Guideline commercial land use guideline as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canada-Wide Standards for Hydrocarbons in Soil", 2000.
- See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by Philip Analytical Services.

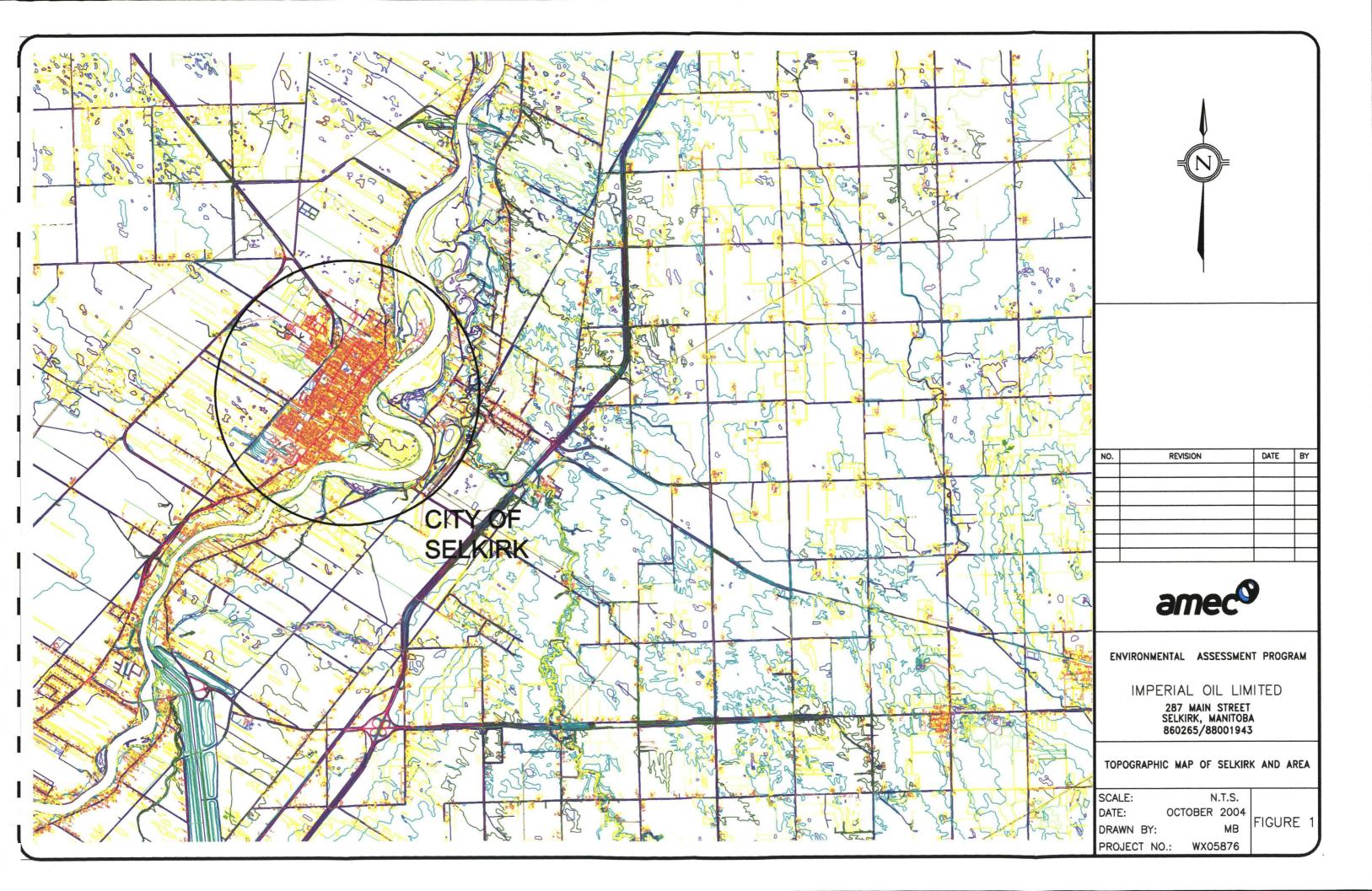


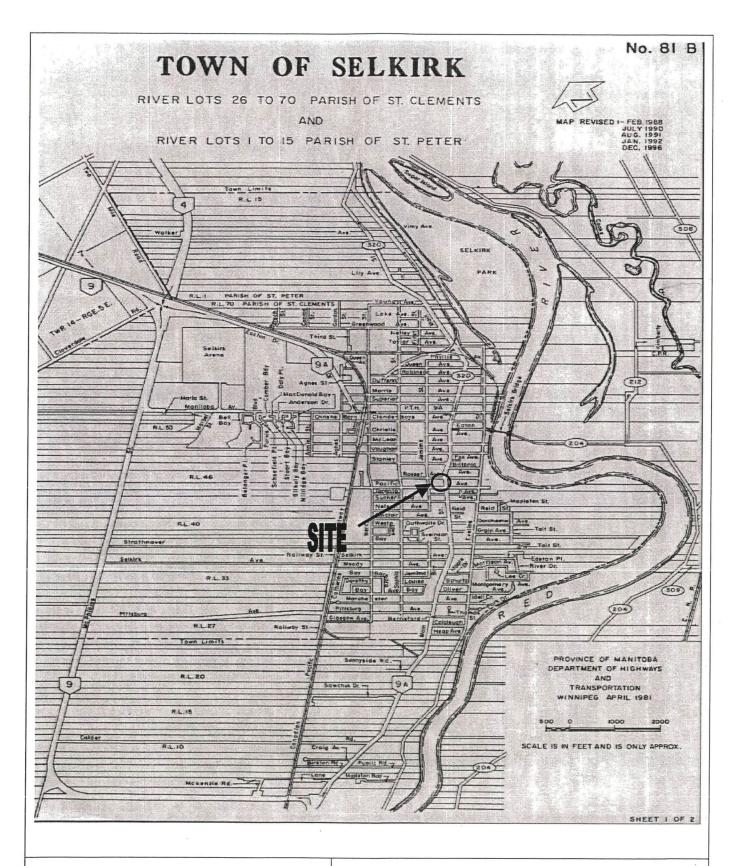
Table 9: Summary of Laboratory Testing - Metals, PAH's, Glycol in Soil

Parameter	04-4 (0.8m)	04-4(3.8m-4.6m)	04-8 (0.8m)	04-8 (4.6m)	CCME Guidelines
Trace Metals					
Arsenic	<0.2	NA	0.7	NA	12
Barium	9.9	NA	17.7	NA	2000
Chromium	3	NA	4	NA	87
Copper	3.5	NA	4.3	NA	91
Lead	2.4	NA	3.1	12.9	260
Zinc	7	NA	10	NA ^s	360
PAHs					
Benzo(a)pyrene	NA	<0.01	NA	<0.01	1.41
Naphthalene	NA	<0.01	NA	0.65	22
Glycols			12. 18.		
Ethylene Glycol	<5	NA	581	NA	1800
Diethylene Glycol	<5	NA	1630	NA	NG
Propylene Glycol	<5	NA	66.7	NA	NG

- All concentrations in micrograms per gram (ug/g) unless otherwise stated
- NG no guideline
- < less than the analytical detection limit
- CCME Canadian Council of Ministers of the Environment
- CCME EQG Guideline commercial land use guideline as outlined in the Canadian Council of the Ministers of the Environment (CCME) "Canadian Environmental Quality Guidelines", 1999.
- 1 Benzo(a)pyrene guideline revised to reflect lack of groundwater as domestic consumption pathway.
- See laboratory report for detection limits, testing protocols and QA/QC procedures. Laboratory analysis was performed by AMEC's Edmonton Laboratory.







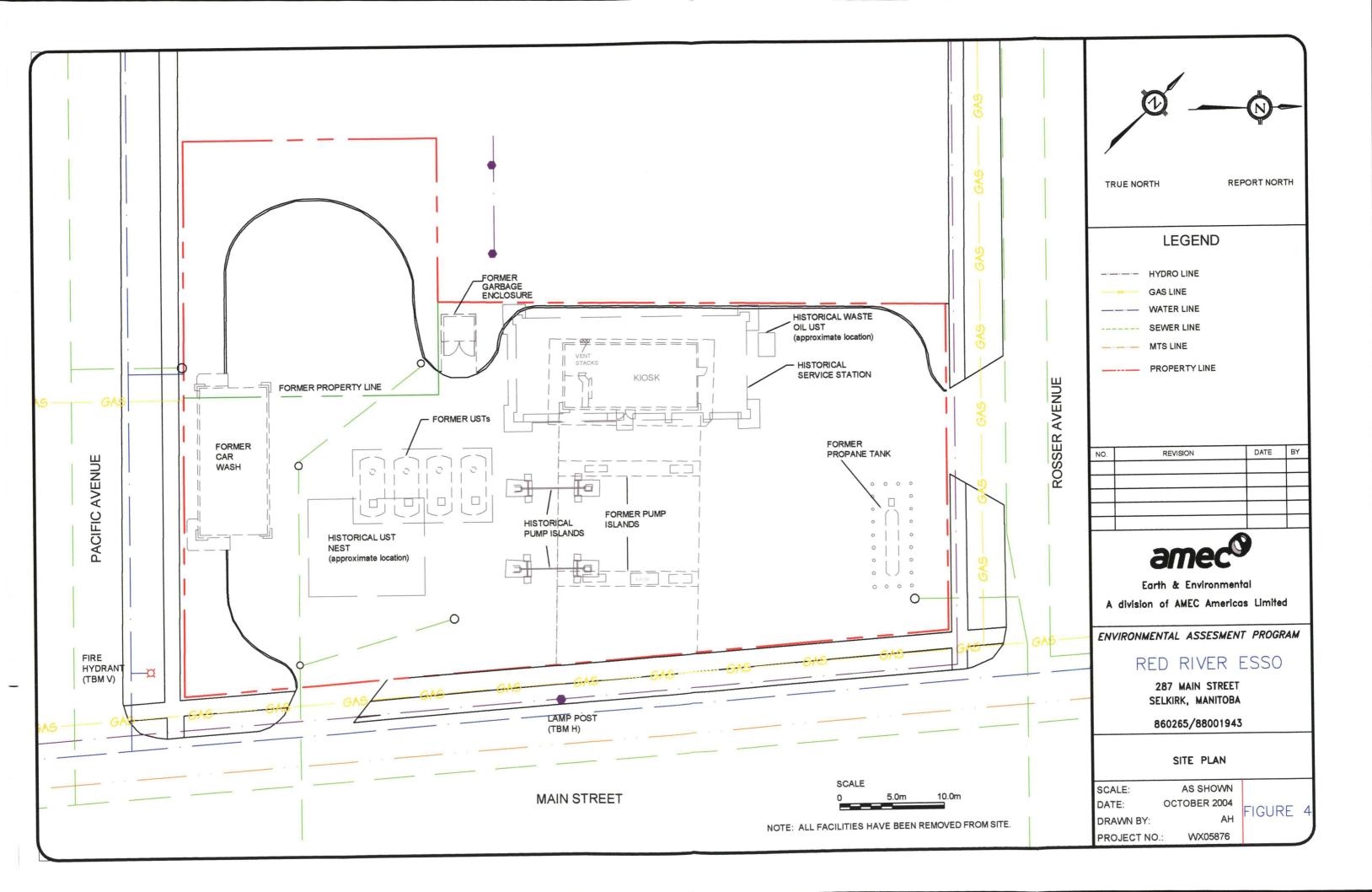


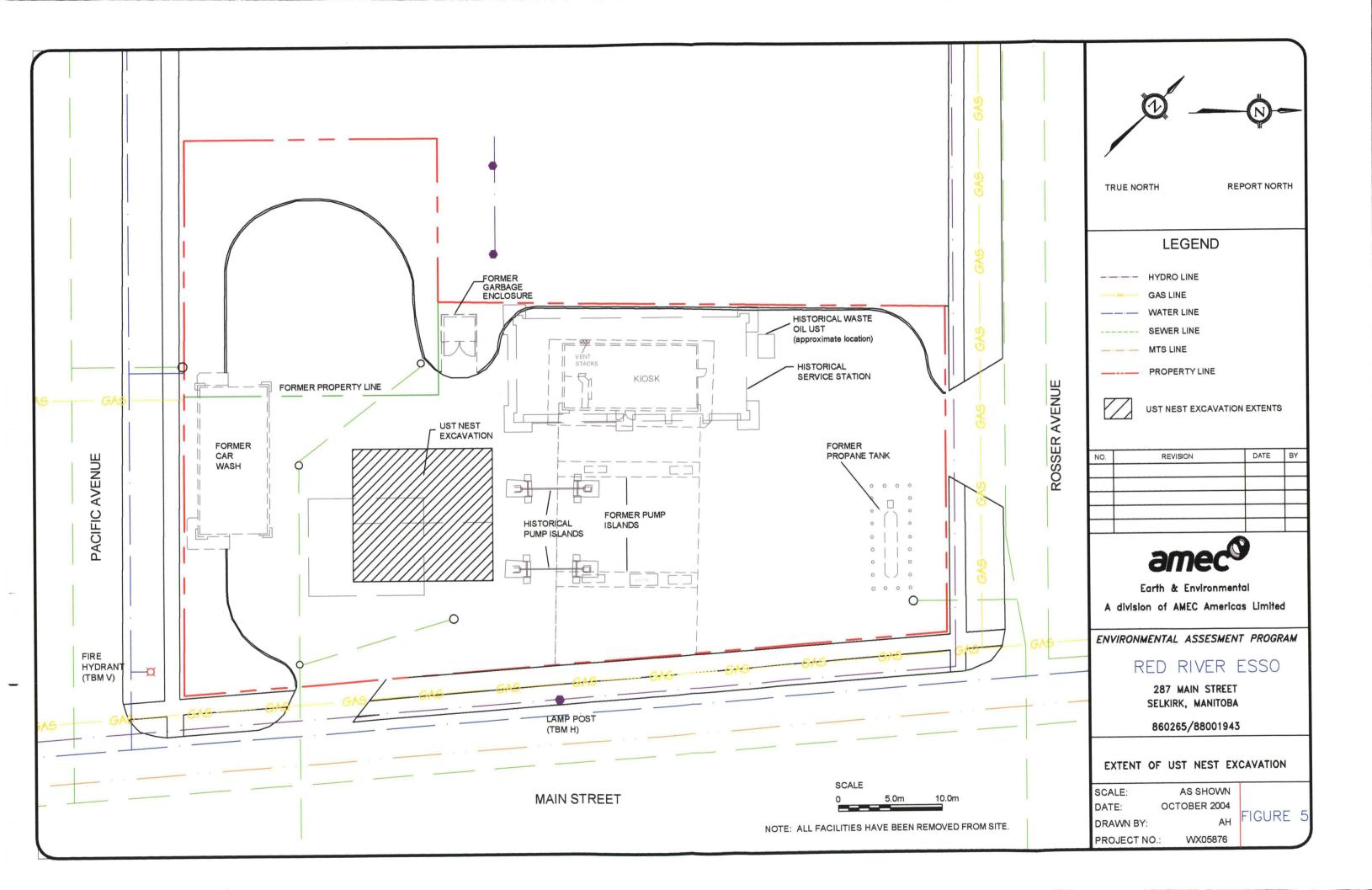
Earth & Environmental IMPERIAL OIL LIMITED

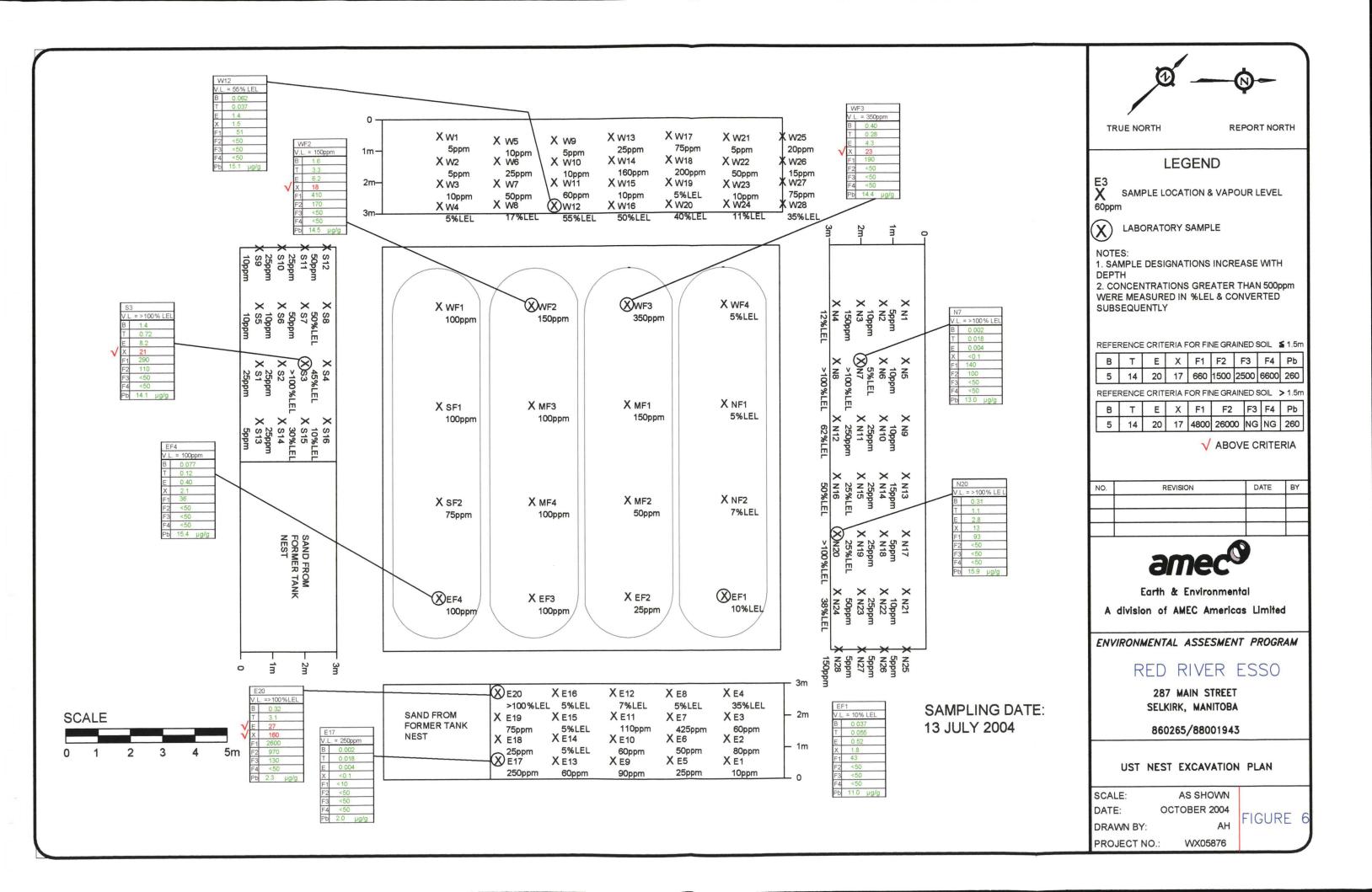
KEY MAP
ENVIRONMENTAL ASSESSMENT PROGRAM
860265 / 88001943
287 MAIN STREET
SELKIRK, MANITOBA

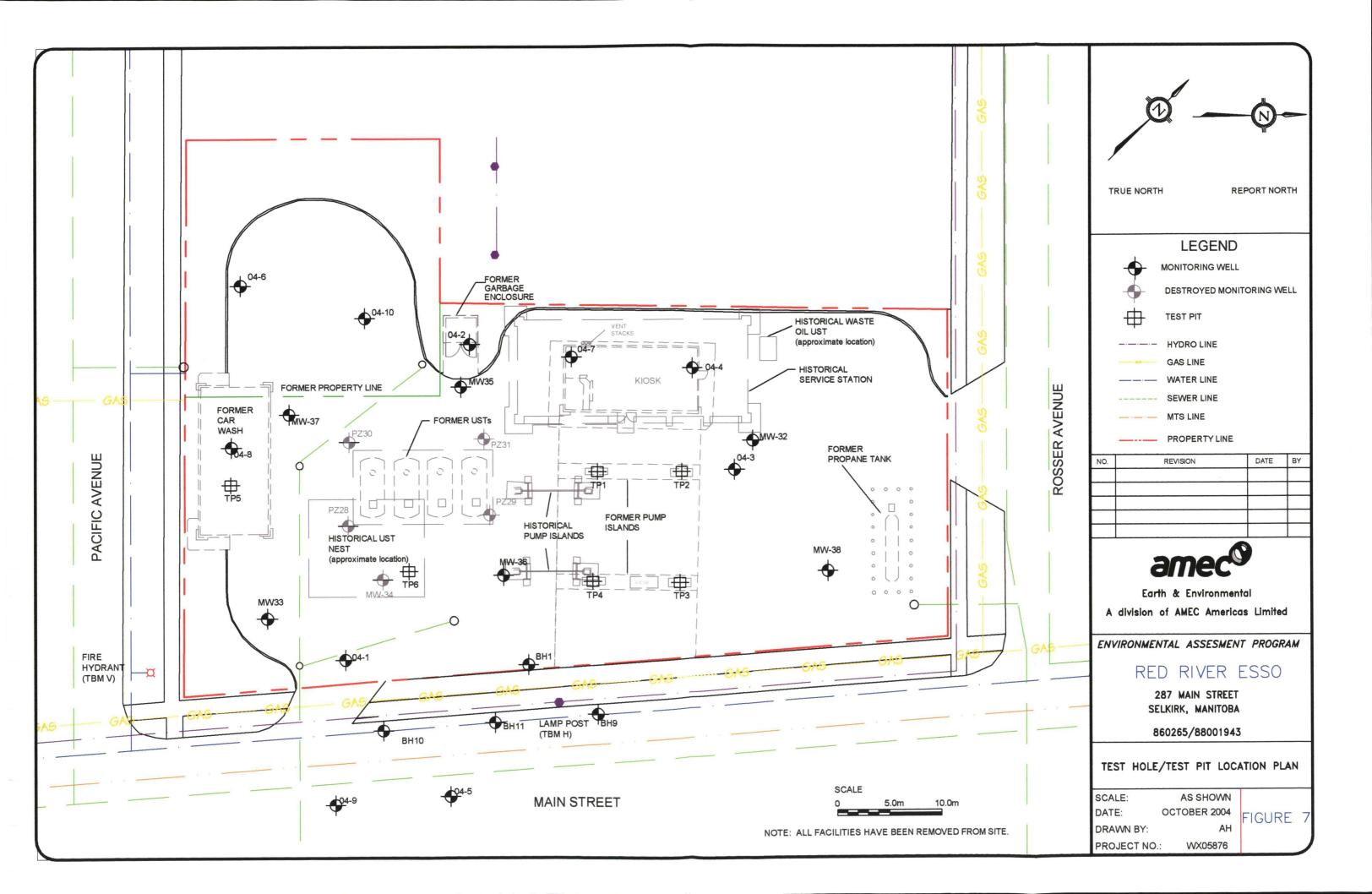
Drawn: N/A Scale: As Shown Date: OCT/04 Project No.: WX-05876 Figure: 2

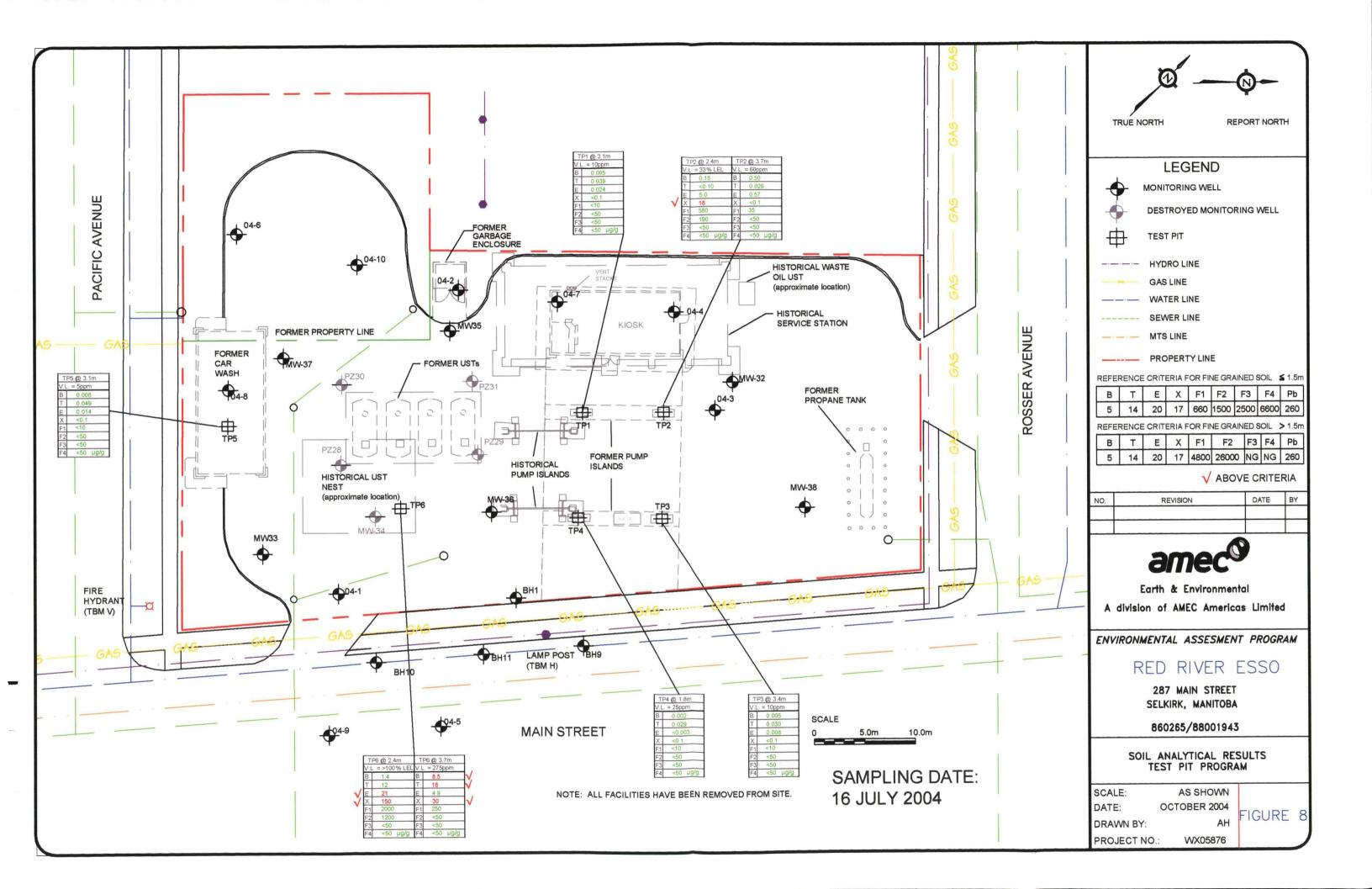


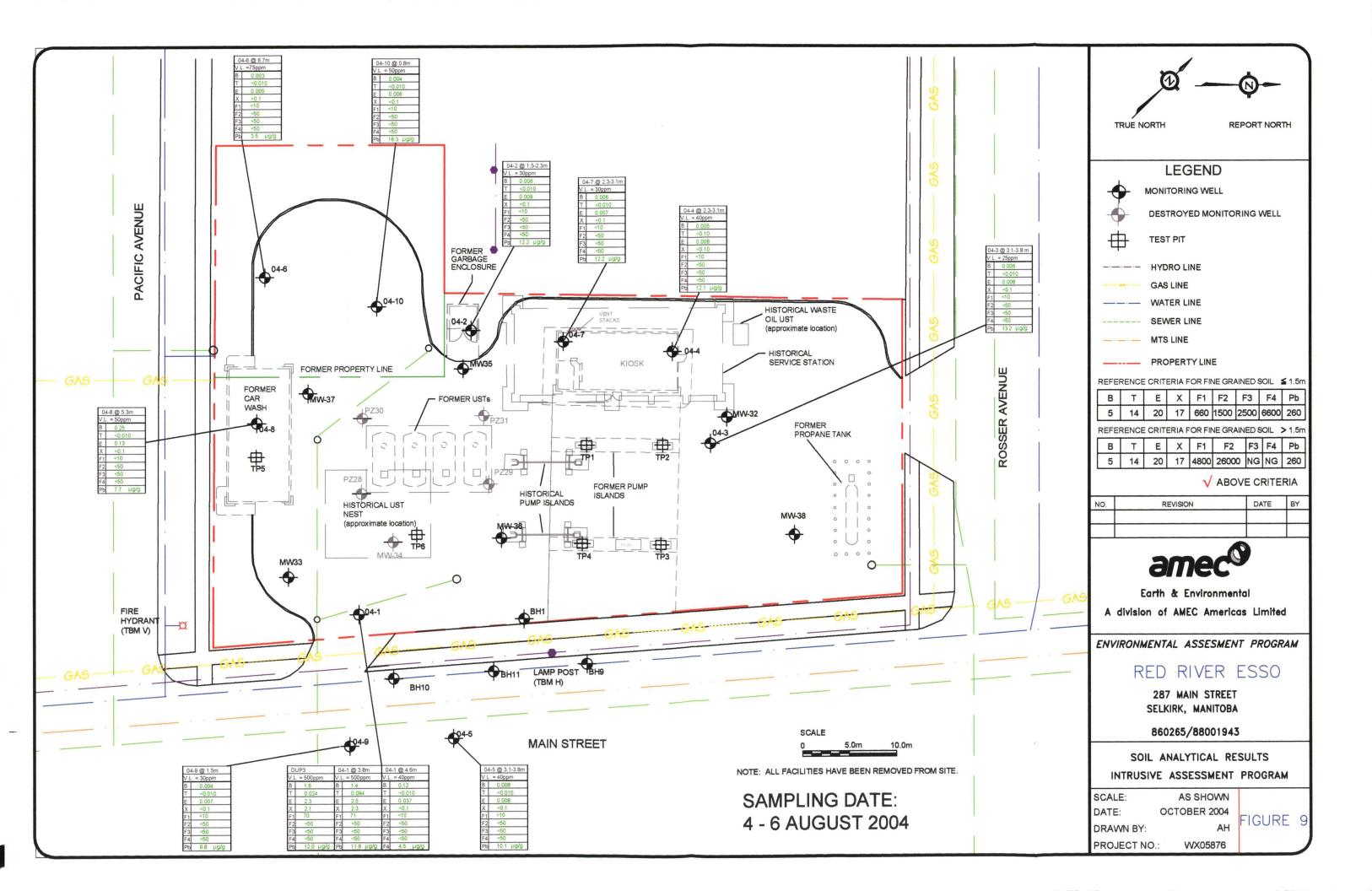


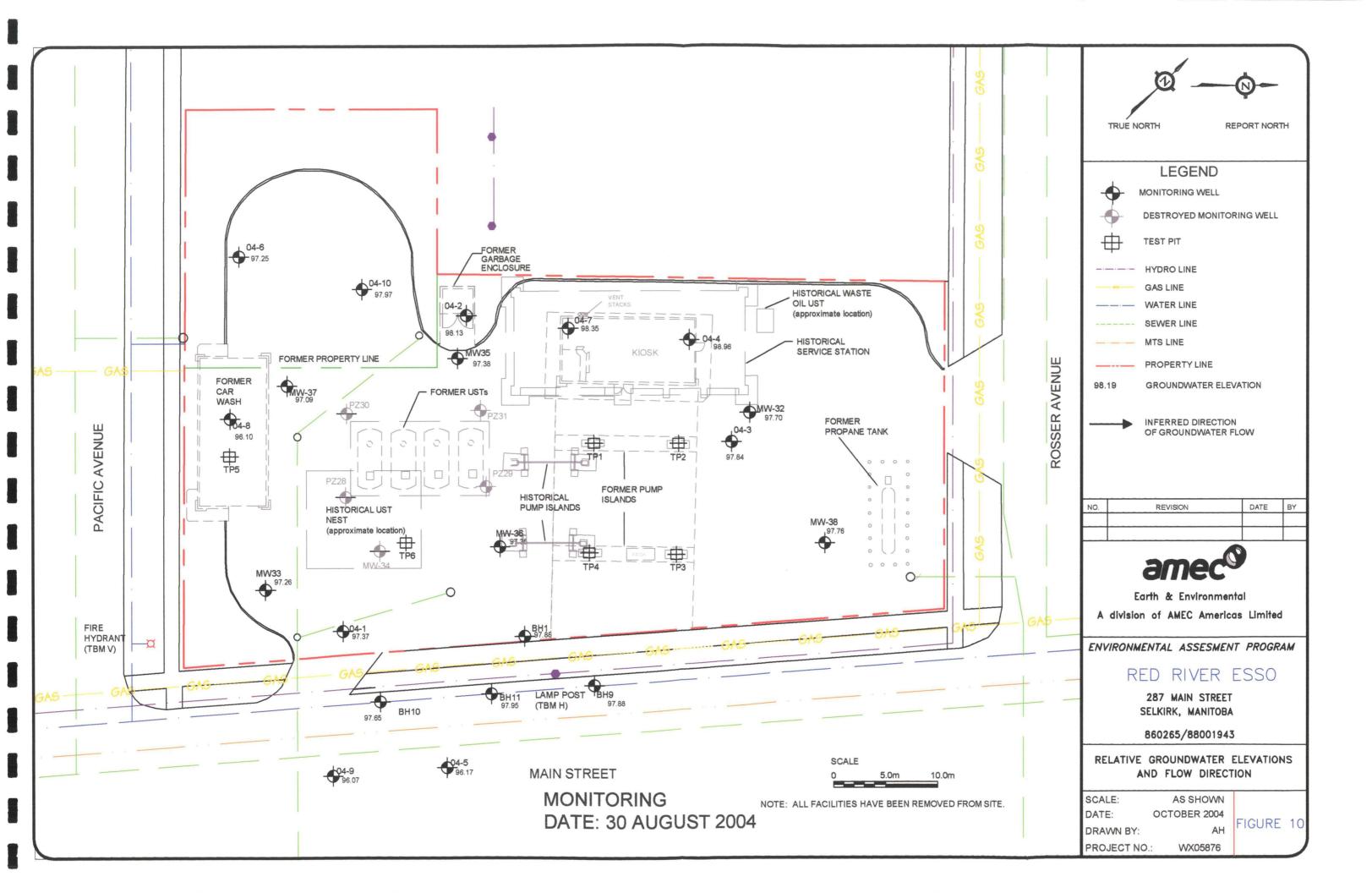


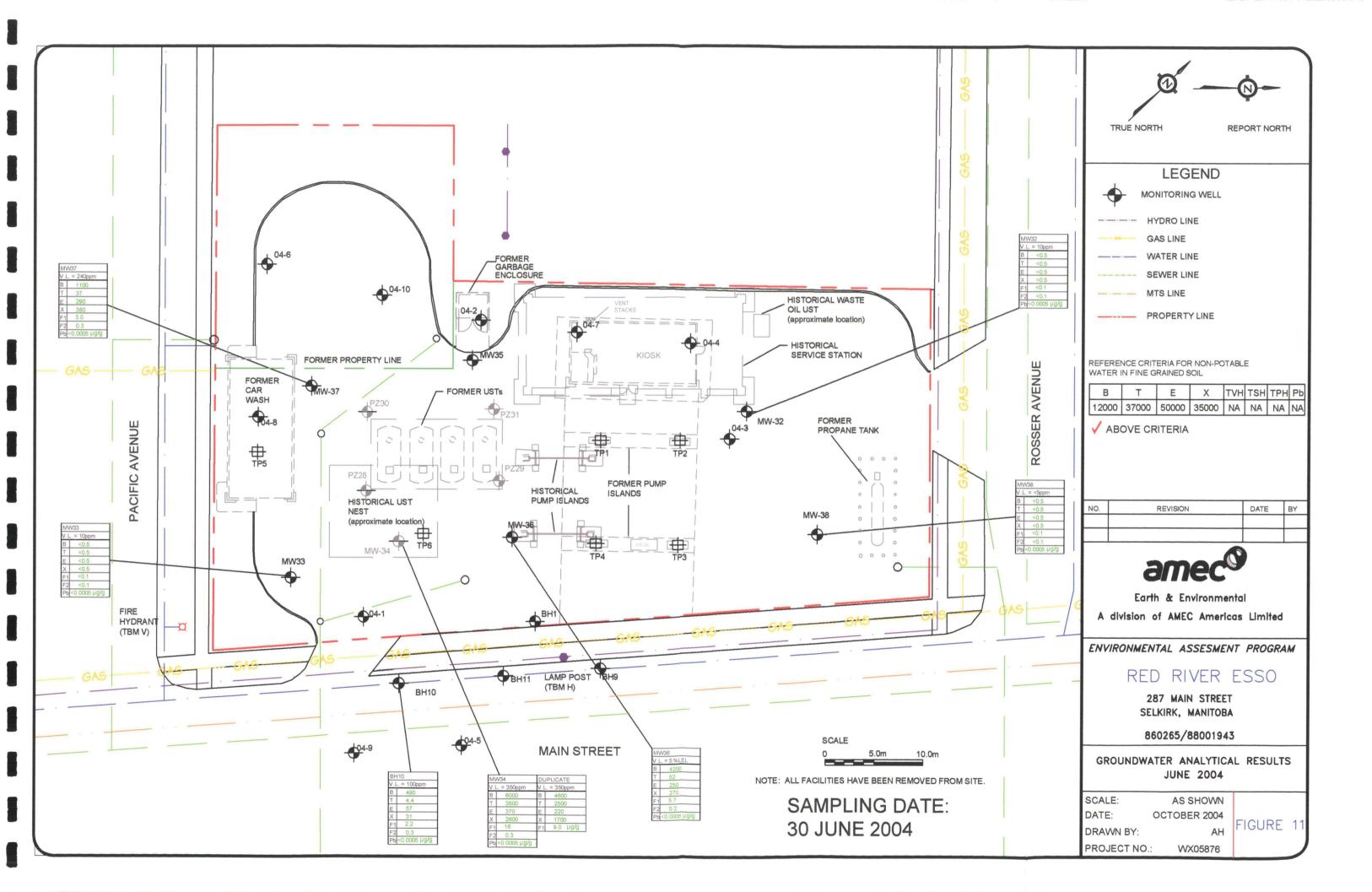


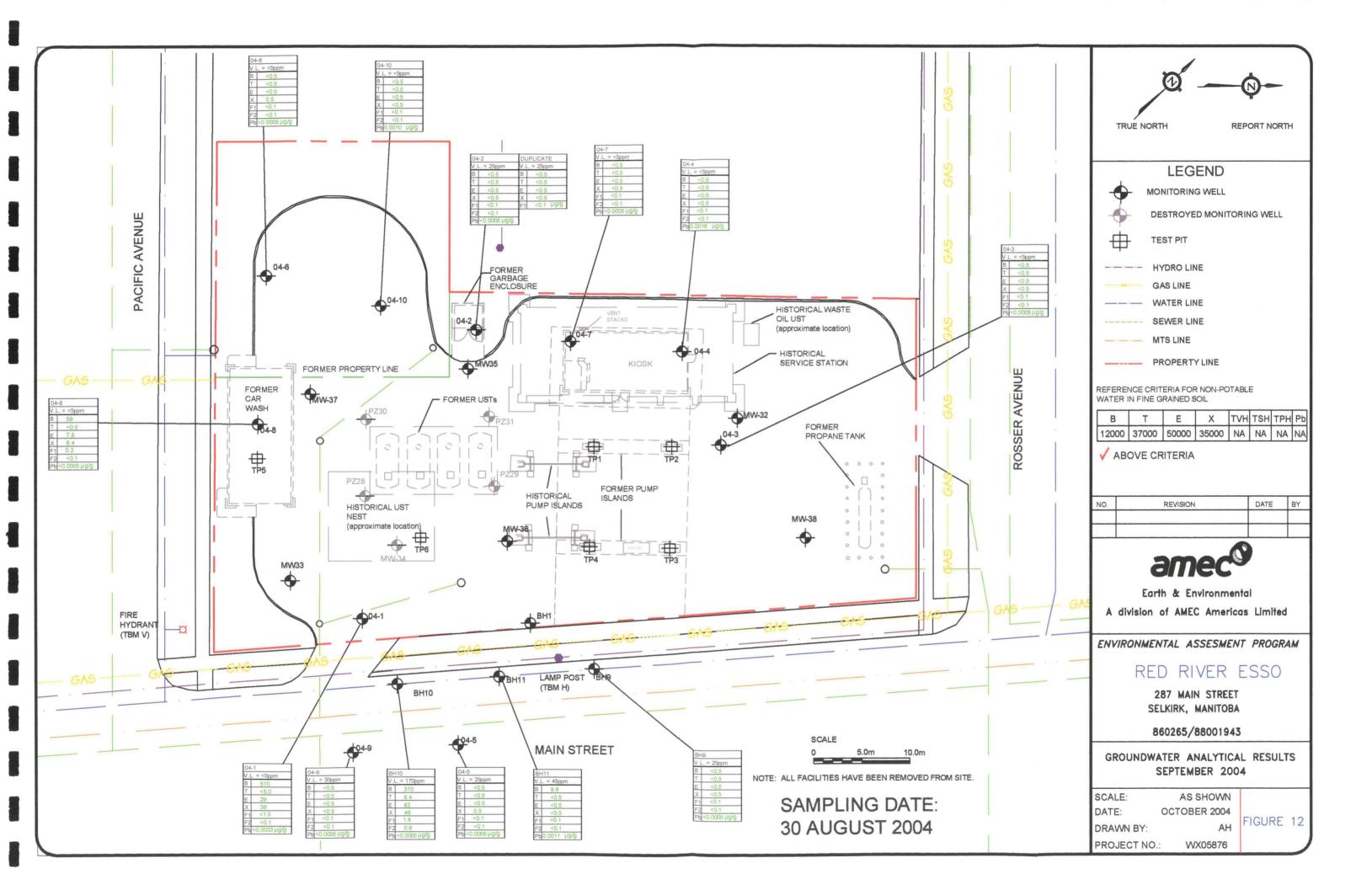


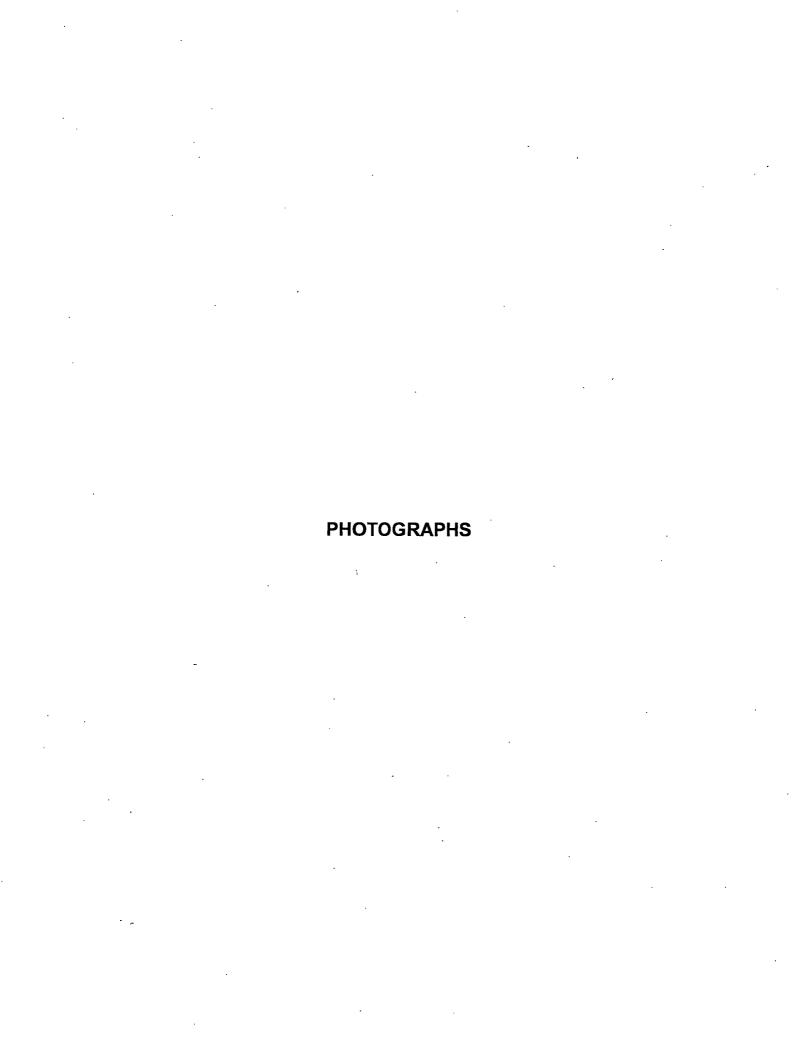






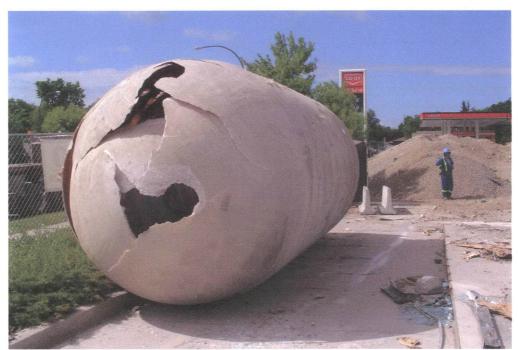








PHOTOGRAPH 1: Exposing USTs.



PHOTOGRAPH 2: Storage of UST on Site before destruction and removal from Site.



IMPERIAL OIL LIMITED

Drawn: N/A Scale: N/A

SITE PHOTOGRAPHS
ENVIRONMENTAL ASSESSMENT PROGRAM
FORMER IOL GAS BAR
287 MAIN STREET
SELKIRK, MANITOBA

Date: SEPT/04 Project No.: WX-05876 Figure: P1



PHOTOGRAPH 3: Destruction of UST prior to loading into waste bin for transport.



PHOTOGRAPH 4: General overview of Site (as viewed from the north) during UST removal.



IMPERIAL OIL LIMITED

Drawn: N/A Scale: N/A

SITE PHOTOGRAPHS
ENVIRONMENTAL ASSESSMENT PROGRAM
FORMER IOL GAS BAR
287 MAIN STREET
SELKIRK, MANITOBA

Date: OCT/04 Project No.: WX-05876 Figure: P2



PHOTOGRAPH 5: Looking north on southern property limits. Former UST nest in foreground of photograph. Former Robin's Donuts and Library across Rosser Avenue in background.



PHOTOGRAPH 6: Looking south on northern property limits. Co-op Service Station across Pacific Avenue in background.



IMPERIAL OIL LIMITED

Drawn: N/A Scale: N/A Date: OCT/04 Project No.: WX-05876 Figure: P3

SITE PHOTOGRAPHS
ENVIRONMENTAL ASSESSMENT PROGRAM
FORMER IOL GAS BAR
287 MAIN STREET
SELKIRK, MANITOBA



PHOTOGRAPH 7: Looking southwest from the northeast corner of the property. Vacant commercial lot and residential properties visible in the background.



PHOTOGRAPH 8: Looking across the Site to the east. Cambrian Credit Union and residential properties visible in the background of photograph across Main Street.



IMPERIAL OIL LIMITED

Drawn: N/A Scale: N/A Date: OCT/04 Project No.: WX-05876 Figure: P4

SITE PHOTOGRAPHS
ENVIRONMENTAL ASSESSMENT PROGRAM
FORMER IOL GAS BAR
287 MAIN STREET
SELKIRK, MANITOBA

APPENDIX A LEGAL SITE SURVEY DRAWING



117 Fort Street, Winnipeg, MB R3C 1C6 T: (204) 947 - 1557 F: (204) 943 - 8024 Toll Free: 1-800-563-8656

Wednesday: 9 am - 5 pm Civic Centre, Rm 305, Winkler, MB R6W 4B7 T: (204) 325-4615

Albert G. Degner M.L.S., C.L.S.

Leslie McLaughlin M.L.S., C.L.S.

Donald N. Bourgeois M.L.S., C.L.S.

Jim G. Watling P.Eng., B.Sc. S.E., M.L.S., C.L.S.

K.M. (Ken) Yerex M.L.S., C.L.S., B.Sc.

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SURVEYOR'S STAKING

C R

PREPARED FOR:

AMEC Earth & Environmental Ltd. 440 Dovercourt Drive Winnipeg, MB **R3Y 1N4**

CIVIC ADDRESS:

287 Main Street - City of Selkirk

CERTIFICATES OF TITLE:

B57019 (Pcls. 1-3) and 1325272 (Pcl. 4) (Searched: 30/07/2004)

REGISTERED OWNER:

IMPERIAL OIL LIMITED

LEGAL DESCRIPTION:

PARCEL ONE: THE N 1/2 OF LOT 69 AND ALL OF LOTS 70, 71, 72 AND 73 PLAN 9328 WLTO (LISGAR DIV) EXC OUT OF ALL SAID LOTS ALL THAT PORTION TAKEN FOR PUBLIC LANE PLAN 10518 WLTO IN LOT 46 PARISH OF ST CLEMENTS PARCEL TWO: ALL THAT PORTION OF LOT 69 PLAN 9328 WLTO (LISGAR DIV) TAKEN FOR PUBLIC LANE PLAN 5570 WLTO, NOW CLOSED, WHICH LIES TO THE EAST OF A LINE DRAWN EAST OF, PARALLEL WITH AND PERP DISTANT 20 FEET FROM THE WESTERN LIMIT OF SAID LOT 69, EXC OUT OF PARCEL TWO MINES AND MINERALS IN LOT 46 PARISH OF ST CLEMENTS

PARCEL THREE: LOTS 20 AND 21 PLAN 22 WLTO (LISGAR DIV)

IN LOT 45 PARISH OF ST CLEMENTS

PARCEL FOUR: LOTS 22 AND 23 PLAN 22 WLTO (L DIV)

IN RL 45 PARISH OF ST CLEMENTS

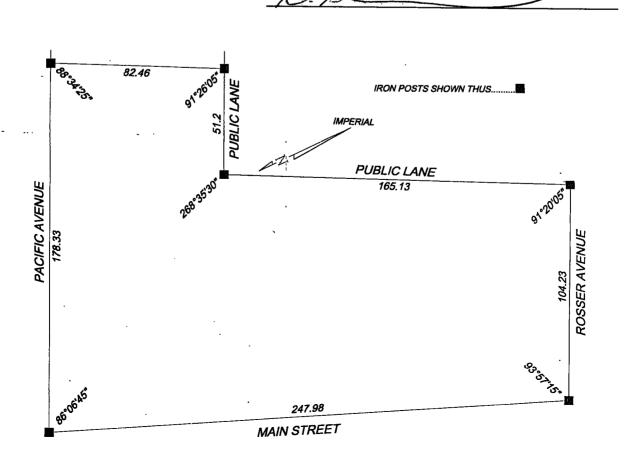
INSTRUMENT NO'S:

J 65348 and 199900 are registered against the property.

DATE OF SURVEY:

August 5, 2004

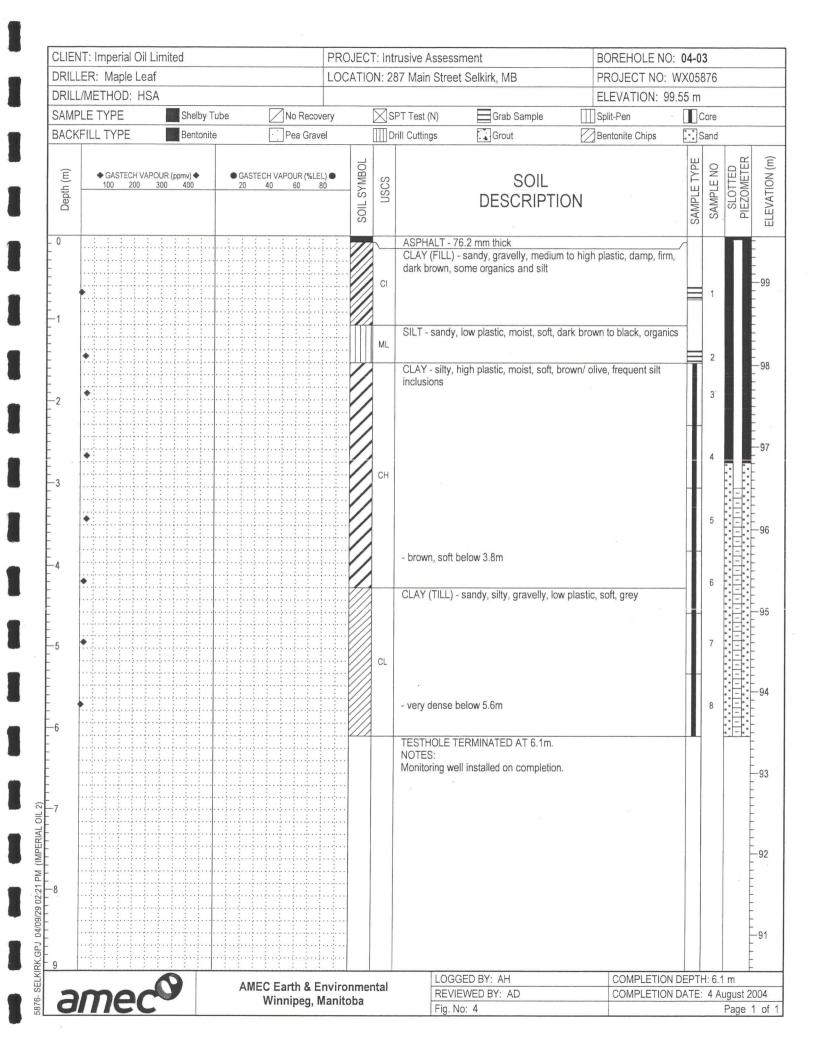
There are no encroachments above ground level onto the above described land by buildings from adjoining properties except as shown on the sketch below.



APPENDIX B TEST HOLE AND TEST PIT LOGS

CLIEN	NT: Imperial Oil Limite	d		PROJE	CT: In	trusive Asses	sment	BOREHOLE NO: 04-01					
	ER: Maple Leaf			LOCAT	ION: 2	87 Main Stre	et Selkirk, MB	PF	ROJECT NO: W	VX058	376		
DRILL	_/METHOD: HSA	-						EL	EVATION: 99.	22 m			
SAMP	PLE TYPE	Shelby Tube	☑No Recov	ery	⊠s	SPT Test (N)	Grab Sample	∭Spl	it-Pen		ore		
BACK	FILL TYPE	Bentonite	Pea Grave	el		Orill Cuttings	Grout		ntonite Chips	<u>∷</u> s	and		
Depth (m)	◆ GASTECH VAPOUR (pg 100 200 300	omv) ◆ ● GAS' 400 20	TECH VAPOUR (%LEI 40 60 8	Odwys IIOs	USCS USCS		SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SLOTTED PIEZOMETER	E! EVATION (m)
. 0	•				SP	brown	- gravelly, poorly graded				1		
-1	•				L L		IMESTONE (FILL) - san				2		- - -98 - -
2 2	•					inclusions		, brown, no	quant siit		3		- - - - 97 - - -
-3		•			CH		d lens with black staining		9m and 3.2m		5		
-5						SILT (TILL)	sandy, gravelly, low plas	tic, moist, bi	rown, some clay		7		95
-6 -7					ML						9		-93 92
-8						NOTES:	TERMINATED AT 7.6m. nes from sand at 2.9m to completion.	3.2m. Monito	oring well				- - - - - - - - - - - - - - - - - - -
	1	ARA	EC Earth & E	nviron	ontal		GED BY: AH		COMPLETION I				
2	mec ^v	7 AW	Winnipeg, N				IEWED BY: AD		COMPLETION I	DATE:			
U			pog, n		-	l Fia.	No: 2					age	1 of

	IT: Imperial Oil Limited				rusive Assessment		BOREHOLE NO: 04-02				
	ER: Maple Leaf		LOCATIO	ON: 28	37 Main Street Selkirk, MB		ROJECT NO: W		876		
	/METHOD: HSA						LEVATION: 99.4				
		elby Tube No Recov		_	PT Test (N) Grab Sample		olit-Pen				
ACK	FILL TYPE Be	entonite Pea Grav	el	ШР	rill Cuttings Grout	<u></u> ∠ Be	entonite Chips	<u></u>	Sand		т
Depth (m)	◆ GASTECH VAPOUR (ppmv) 100 200 300 400	GASTECH VAPOUR (%LE 20 40 60 1	SOIL SYMBOL	nscs	SOIL DESCRIPT	ΓΙΟΝ		SAMPLE TYPE	SAMPLE NO	SLOTTED PIEZOMETER	
	•			CI	CLAY (FILL) - gravelly, medium to h brown, some silt, trace sand and org	ganics			1		
	•			ML	SILT - sandy, low plastic, moist, sof clay				. 2		
	•				CLAY - silty, high plastic, moist, firm frequent silt inclusions, oxidized	i, brown to da	rk brown,		3		
	•			СН	- grey mottling between 2.4m and 3 very silty below 3.1m	1m			4		
									5		
	•			CL	CLAY (TILL) - silty, sandy, gravelly, soft to firm, brown	low to medium	m plastic, moist,		7		
	•				- dense and firm to stiff below 5.6m TESTHOLE TERMINATED AT 6.1m				8		
					NOTES: Monitoring well installed on completi						
				-	·						- - - -
			:]		LOCOED DV. AU		COMPLETIONS	EDT.	1.00		<u>-</u>
_		AMEC Earth & E		ntal	LOGGED BY: AH REVIEWED BY: AD		COMPLETION D				_
	mec ^y	Winnipeg, N	/lanitoba		Fig. No: 3		JOHN LETION L	,,,ı -		Page	



LIENT: Imperial C	il Limited		PROJEC	T: Intr	usive Assess	ment	BC	DREHOLE NO:	04-0	4	
RILLER: Maple L		·····	LOCATIO	ON: 28	37 Main Stree	t Selkirk, MB		ROJECT NO: W		376	
RILL/METHOD: I	HSA.						EL	EVATION: 99.0	6 m		
AMPLE TYPE	Shelby To	ube No Reco	very	SI	PT Test (N)	Grab Sample	∭Sp	lit-Pen		ore	
ACKFILL TYPE	Bentonite	Pea Gra	vel	Di	rill Cuttings	Grout	Be	ntonite Chips	∴ S	and	
E ◆GASTECH 100 200	VAPOUR (ppmv) ◆ 300 400	● GASTECH VAPOUR (%LI 20 40 60	SOIL SYMBOL	USCS		SOIL DESCRIPTI	ON		SAMPLE TYPE	SAMPLE NO	PIEZOMETER
				SP	CLAY - silty,	- gravelly, poorly graded - high plastic, moist, soft to				2 . 3	9 - 9
				СН	- softer and m	ore moist below 3.1m wi	ith a higher	silt content ·		5	9
					SILT (TILL) - :	sandy, gravelly, low plas	tic, moist, b	rown, some clay		7	9
• : : : : : : : : : : : : : : : : : : :				ML	- firm below 6	4m ERMINATED AT 6.9m.				9	
					NOTES:	e from till below 5.2m. M	onitoring we	ell installed on			
					1.00	DED DV. ALL		00101555		1.00	<u></u>
	~	AMEC Earth & B		ntal		GED BY: AH EWED BY: AD		COMPLETION D			
ame		Winnipeg,	Manitoba			lo: 5		JOINE LE HON L	<i>-</i> ∧ ⊑.		age 1

	NT: Imperial Oil Limited				rusive Assessment		BOREHOLE NO: 04-05		
	ER: Maple Leaf		LOCAT	ON: 2	87 Main Street Selkirk, MB	PROJECT NO			
	/METHOD: HSA				<u>_</u>	ELEVATION:			
		elby Tube No Recove			PT Test (N) Grab Sample	Split-Pen	Core		
BACK	FILL TYPE Be	ntonite Pea Grave			rill Cuttings Grout	Bentonite Chips	Sand		
Depth (m)	◆ GASTECH VAPOUR (ppmv) 100 200 300 400	● GASTECH VAPOUR (%LEL) 0 40 60 80	SOIL SYMBOL	USCS	SOIL DESCRIPTI	ON	SAMPLE TYPE SAMPLE NO SLOTTED PIEZOMETER	ELEVATION (m)	
0					ASPHALT				
				SP	CONCRETE SAND (FILL) - gravelly, poorly graded	, damp, brown		-QR	
·1					CLAY - high plastic, damp, soft, brown	n, some silt	2	-90	
2				СН			3	-97	
-3	•				- silty and moist below 2.4m		4	-96	
	•			1	CLAY (TILL) - silty, gravelly, low plasti	ic. soft. brown			
4	•			2	- grey/ brown below 4.0m	o, con, cremi	6	-95	
5	•			P P	- dark brown below 5.5m, stiff with larg	ge silt pockets	7	·94 -93	
				1	TESTHOLE TERMINATED AT 6.1m.	·			
-7					NOTES: Monitoring well installed on completion	n.		-92	
9								90	
		41100 000			LOGGED BY: AH	COMPLETION	ON DEPTH: 6.1 m	_	
2	mec	AMEC Earth & Er Winnipeg, M			REVIEWED BY: AD		ON DATE: 6 August 20		
0	ハノてし	wininpeg, W	amuuud		Fig. No: 6		Page 1	of	

CLIEN	NT: Imperial Oil	Limited		PROJEC	CT: In	trusive A	ssessment	ВС	BOREHOLE NO: 04-06				
	ER: Maple Lea						Street Selkirk, MB		ROJECT NO: V				
	_/METHOD: HS						W		EVATION: 99.				
	LE TYPE	Shelby Tul	be No Reco	overy	X	SPT Test (N	N) Grab Sample	Sp			ore		
	FILL TYPE	Bentonite	Pea Gra	vel	-	Orill Cutting			ntonite Chips	:: S			
		_		30					,			:D TER	(m)
Depth (m)	◆ GASTECH VAF	300 400	• GASTECH VAPOUR (%L 20 40 60	SOIL SYMBOL	NSCS		SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SLOTTED PIEZOMETER	ELEVATION (m)
					CH CH	CLAY - inclusio	FILL) - gravelly, poorly grade high plastic, moist, firm, browns				1 2 3 4		
4 	•					,	FILL) - silty, gravelly, medium ravelly and silty below 5.0m	plastic, soft,	brown		6		- - - - - - - - - - - - - - - - - - -
6					CI	600000000000000000000000000000000000000	elow 5.8m and dry below 6.1m				8		—94
8	•					NOTES	e zones from till at 5.8m. Mor		nstalled upon		10		
a	med	0	AMEC Earth & Winnipeg,		ental		LOGGED BY: AH REVIEWED BY: AD Fig. No: 7		COMPLETION COMPLETION		5 Au	ugust 2	2004 1 of 1

CLIEN				rusive Assessment		BOREHOLE NO: 04-07							
DRILL		LOCATION: 287 Main Street Selkirk, MB				PROJECT NO: WX05876							
	/METHOD: HSA			<u> </u>			EVATION: 99.			•			
SAMPLE TYPE Shelby Tube No Recove					PT Test (N) Grab Sample		lit-Pen	Core					
BACK	FILL TYPE Ben	tonite Pea Grave	<u> </u>	Шр	rill Cuttings Grout	∠Be	entonite Chips	<u></u> ∏s	and				
Depth (m)	◆ GASTECH VAPOUR (ppmv) ◆ 100 200 300 400	● GASTECH VAPOUR (%LEL 20 40 60 80	SOIL SYMBOL	nscs	SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SLOTTED PIEZOMETER	ELEVATION (m)		
0				SP	SAND (FILL) - gravelly, poorly grade damp, light brown	d, fine to me	dium grained,		1		 		
-1	•				CLAY - silty, high plastic, moist, soft, organics to 1.5m	brown/ grey	mottled, trace		2				
-2	•				· .				3		98		
-3	•			СН	- frequent oxidized silt inclusions bele	ow 2.4m			4		-97 - - - - - -		
4									5		-96 - -		
					- very silty between 4.1m and 4.4m SILT (TILL) - sandy, gravelly, low pla	stic, moist, b	prown, some clay		6		- - 95		
-5	•			ML	- dense below 5.2m				7				
					TESTHOLE TERMINATED AT 5.5m. NOTES: Monitoring well installed upon comple			_			-94 -		
-6					·				:		- - - - -93		
7									,				
В											92 92 		
										- - - - - - -	- - 91 -		
9		<u>; </u>	il		LOGGED BY: AH		COMPLETION I	DEPT	H: 5.5	<u> </u>	_		
	mec	AMEC Earth & E		ntal	REVIEWED BY: AD		COMPLETION DATE: 4 Augu				004		
	IIICL	Winnipeg, N	ianitoba		Fig. No: 8				Page 1 c				

CLIE	NT: Imperial Oil Limited	PR	PROJECT: Intrusive Assessment					BOREHOLE NO: 04-08						
DRILLER: Maple Leaf DRILL/METHOD: HSA SAMPLE TYPE Shelby Tube No Recove				LOCATION: 287 Main Street Selkirk, MB					PROJECT NO: WX05876					
									ELEVATION: 99.61.m					
				very SPT Test (N) Grab Sa			Grab Sample	mple Split-Pen			Core			
BACK	(FILL TYPE Be	entonite ·	Pea Gravel		∭Drill Cı	uttings	Grout	Be	ntonite Chips	∴ s	and			
Depth (m)	◆ GASTECH VAPOUR (ppmv, 100 200 300 40		/APOUR (%LEL) ● 60 80					SAMPLE TYPE	SAMPLE NO	SLOTTED PIEZOMETER				
- 0 - 0 					SA da	SAND (FILL) - gravelly, poorly graded, fine to medium grained, damp, light brown					1		9:	
2	•				CL tra	AY - silty, ce organic	high plastic, moist, soft to s to 1.5m	o firm,brown	to dark brown,		3		-	
3					CH - sc sta	ofter below ining betw	3.1m with frequent oxidi een 3.1m and 4.6m	ent oxidized silt inclusions, grey im			4		<u> </u>	
ļ	•				CL firm	AY (TILL) - n, brown/ g	(TILL) - silty, sandy, gravelly, low to medium plastic, soft t rown/ grey				6			
	•				CL - de	ense below	⁄ 5.2m				7			
					NO	TES:	ERMINATED AT 6.1m. I installed upon completion	on.			8	:F:	<u> </u>	
•								·					<u> </u>	
- !		1			Anl	LOGG	GED BY: AH		COMPLETION	DEPTH	1: 6.1	m	[` - - - -	
	mec	Earth & Environning Enripeg, Manit		tai	REVIEWED BY: AD						DATE: 4 August 200			
												J		

CLIENT: Imperial Oil Limited		PROJEC	T: Intru	usive Assessment	BOREHOLE NO:	04-09
DRILLER: Maple Leaf		LOCATIO	N: 287	7 Main Street Selkirk, MB	PROJECT NO: V	
DRILL/METHOD: HSA		-			ELEVATION: 98	
	elby Tube			T Test (N) Grab Sample	Split-Pen	Core
BACKFILL TYPE Ber	tonite Pea Grave	el :	Dril	ll Cuttings Grout	Bentonite Chips	Sand
(E)	GASTECH VAPOUR (%LEL 20 40 60 8)	SOIL SYMBOL	nscs	SOIL DESCRIPTIOI	N	SAMPLE TYPE SAMPLE NO SLOTTED PIEZOMETER ELEVATION (m)
-1 2 3 5 6 6 7 7			CH	ASPHALT CONCRETE SAND (FILL) - gravelly, poorly graded, findamp, brown CLAY - high plastic, damp, firm, brown, or inclusions - moist and soft with frequent silt inclusion CLAY (TILL) - silty, gravelly, low plastic, resand - dark and firm below 5.2m TESTHOLE TERMINATED AT 6.1m. NOTES: Monitoring well installed upon completion	ns below 3.1m	98 2 3 97 4 98 7 98 7 97 8 8 99 7 99 99 99 99 99 99 99 99
amec®	AMEC Earth & E Winnipeg, N		ental	LOGGED BY: AH REVIEWED BY: AD Fig. No: 10	COMPLETION COMPLETION	DEPTH: 6.1 m DATE: 6 August 2004 Page 1 of

	IT: Imperial Oil Lir	mited			PROJ	JECT:	Intrusive	Assessi	ment	В	OREHOLE NO:	04-1	0		
	ER: Maple Leaf				LOCA	NOITA	: 287 Ma	in Street	Selkirk, MB		ROJECT NO: \		376		
	/METHOD: HSA						7				LEVATION: 99				
	LE TYPE	Shelby Tu	be	No Rec			SPT Tes		Grab Sample		olit-Pen				
BACK	FILL TYPE	Bentonite		Pea Gra	avel	Щ	Drill Cut	tings	Grout	Be	entonite Chips	:: S	Sand		
Depth (m)	◆ GASTECH VAPOI 100 200 3	UR (ppmv) ◆ 00 400	• GASTEC 20	CH VAPOUR (%) 40 60	LEL) • 80	SOIL SYMBOL	SOS		SOIL DESCRIP			SAMPLE TYPE	SAMPLE NO	SLOTTED PIEZOMETER	
0	•						CLA plas	Y (FILL) - tic, damp,	silty, sandy, gravelly firm, dark brown, org	to 0.9m, med anics	ium to high		1	Statement of the later of the l	- - 9 - -
1	•								no gravel below 0.9m				2	A STATE OF THE PARTY OF THE PAR	- - - - - - - - - - - - - -
							CLA	Y - silty, h	igh plastic, moist, sof	, brown					
2													3		- - - - - - -
	T						CH - silty	/ below 3.	1m				5		
							CL		silty, gravelly, sandy,	low plastic, n	noist, soft, brown		7		
							TEST NOT Sligh	THOLE TE	ERMINATED AT 6.1m		alled upon				
	1 1 1 1 1 1	0	1 1 1 1	1 1 1 1	: :			LOGG	ED BY: AH		COMPLETION	DEPTH	1:61	m	_
2	meď			C Earth & Winnipeg,			al		WED BY: AD		COMPLETION				00
				winnipeg,	WIGHTED	Ja		Fig. No	n: 11					Page	

CLIEN	IT: Imperial Oil	Limited			PRO	JEC	T: Te	stpit Program	<u> </u>		OR	EHOLE N	O: TP1	
DRILL	ER: Hazco				LOC	ATIO	N: 2	37 Main Stree	et Selkirk, MB	F	RO	JECT NO	: WX05876	
DRILL	/METHOD: Ba	ckhoe										/ATION:		
SAMP	LE TYPE	Shelby Shelby	Tube	☑ No Re	covery			PT Test (N)	Grab Sample	s			Core	
BACK	FILL TYPE	Bentoni	te .	Pea G	ravel	•		rill Cuttings	Grout		ento	nite Chips	Sand	
Depth (m)	◆ GASTECH VAI 100 200	POUR (ppmv) ◆ 300 400	● GASTE	CH VAPOUR (% 40 60	6LEL) ● 80	SOIL SYMBOL	nscs	DE	SOIL SCRIPTION		SAMPLE IYPE		THER TESTS COMMENTS	Depth (π)
- 0							GP	GRANULAR medium grai	FILL - sandy, poorly grade ned, damp, brown	ed,				-
- - - - - - - - - - - - - - - - - - -								CLAY - high brown	plastic, damp, firm to stiff,			1		- - - -1 -
- - - - - - 2							СН					2		-2
												3		
-3 - - - -								TESTPIT TE	RMINATED AT 3.1m.			4		-3
- -4 - -								·						4
-5 -													·	5
- - - - - 6 -														- - -6
-														- - - - - - - - - - - - - - - - - - -
-7									,	, , , , , ,				-8 -
F 9			ļļļ.											þ
ľ	· · · · · · · · · · · · · · · · · · ·		ABS	=	·		mári		GGED BY: AH				ON DEPTH: 3 m	
2	med		AMI	C Earth 8 Winnipeg			ntal		IEWED BY: AD		C	OMPLETI	ON DATE: 16 July	2004
					2) ····	u		Fig.	No: 2				Pa	ge 1 of

RILLMETHOD: Backhoe AMPLETTYPE Shethy Tube No Recovery No Recovery	CLIENT: Imperial Oil Limited					stpit Program		 		OLE NO: TP2	
AMPLE TYPE Shettonite Pas Grave Pas Grave	DRILLER: Hazco		-	LOCATIO)N: 28	37 Main Stree	t Selkirk, MB	 			
ACKFILL TYPE Sentonic Digs Peas Glaved Only South Sentonic Digs South South Sentonic Digs South South Sentonic Digs South Sentonic Digs South South Sentonic Digs South Description Beautiful South Sentonic Digs South Sentonic Digs South Description Granultar Fill gravel poorly graded, medium plasts, damp, strey, organics, strey, organics, strey, strey, organics, strey, strey, organics, strey, strey, organics Testiful Terminated African Similar Digs CAA' high plastic, damp, firm to stiff, brown Testiful Terminated African Similar Digs Testiful Terminated Digs T											
SOIL DESCRIPTION SOIL DESCRIPTION OTHER TESTS COMMENTS OTHER TESTS COMMENTS											
GRANULAR FILL - gravel, poorly graded, medium gained, damp, provin CLAV (FILL) - isity, medium plastic, damp, grey, organics, gravel SILT, FILL - isity busies, damp, grey, organics, gravel SILT, FILL - isity busies, damp, grey, organics, gravel SILT, FILL - isity busies, damp, firm to stiff, brown TESTPTT TERMINATEO AT 3.7m	BACKFILL TYPE	Bentonite	Pea Gravel		∭D ₁	rill Cuttings	Grout	Bento	onite (Chips Sand	
TESTPIT TERMINATED AT 3.7m	GASTECH VAPOUR (ppm 100 200 300 3	nv) ◆	H VAPOUR (%LEL) 40 60 80	SOIL SYMBOL	nscs	DE:		SAMPLE TYPE	SAMPLE NO		
	1				CI	medium grain CLAY (FILL) grey, organic SILT (FILL) - organics - sandy at 2.3 CLAY - high brown	ned, damp, brown - silty, medium plastic, dan s, gravel low plastic, damp, grey,		3 4		-3
Winnipeg, Manitoba REVIEWED BY: AD COMPLETION DATE: 16 July 2004	amec®	AME			ntal		GED BY: AH EWED BY: AD				

	IT: Imperial Oil Li	mited								stpit Program		+		OLE NO: TP3	•
	ER: Hazco					L	LOCA	TION	N: 28	37 Main Street Selkirk, MB		—		CT NO: WX05876	
	/METHOD: Back		T.	Г	7					TT (60)	m	<u> </u>	EVAT		
	LE TYPE	Shelb		<u> </u>		Recover	у			PT Test (N) Grab Sample rill Cuttings Grout			t-Pen tonite	Chips Core	
BACK	FILL TYPE	Bento	nite	l	· _ Pea	Gravel	—Т	<u>U</u>	Шо	nii Cuttings Grout	[2] Beu	tonite	Unips []Sand	
Depth (m)	◆ GASTECH VAPO 100 200 3	UR (ppmv) ◆ 800 400		GASTECH 20 4	I VAPOUF 0 60	R (%LEL) (•	SOIL SYMBOL	nscs	SOIL DESCRIPTION		SAMPLE TYPE	SAMPLE NO	OTHER TESTS COMMENTS	Depth (m)
0		· · · · · · ·					}		GP	GRANULAR FILL - gravel, poorly g medium grained, damp, brown	graded,				Ŧ
· · ·	•								СН	CLAY (FILL) - high plastic, damp, f stiff, brown	irm to	=	1		
-1									ML	SILT (FILL) - sandy, low plastic, da grey/ black	imp, soft,		2		-
-2										CLAY - high plastic, damp, firm to s brown	stiff,			·	2
	• : : : : : : : : : : : : : : : : : : :								СН				3 		1.1.1.1.1
-3													4		-3 -3
										TESTPIT TERMINATED AT 3.3m.			4		1.1.1.1.1.1
4															4
-5															5
,															
- 6															6
7												-			-
'															-7 - - - -
8															8
														·	
9			T :::			· · · · · ·				LOGGED BY: AH			COM	PLETION DEPTH: 3.3 m	
	med	C)				ı & En			ital	REVIEWED BY: AD		-		PLETION DATE: 16 July	2004
d	IIICC			٧	vinnip	eg, Ma	anıto	Da		Fig. No: 4					je 1 of

DRILL/ SAMPL				LOCATIO	N: 28	7 Main Street Selkirk, MB		PR).IFC	CT NO: WX05876	
SAMPL BACKF	LE TYPE S	-				7 Wall Street Scikirk, WD		1 1//	0000	51 NO. WX03070	
BACKF								ELE	VAT	TON:	
	FILL TYPE	helby Tube	No Recove	ery	SP	T Test (N)		Split	-Pen	Core	
		entonite	Pea Grave	el	-	Ill Cuttings Grout		-		Chips Sand	
Dept	◆ GASTECH VAPOUR (ppm 100 200 300 4	v) ◆ GAS 00 20	TECH VAPOUR (%LEL 40 60 8)	SOIL SYMBOL	SOSO	SOIL DESCRIPTION	e e	SAMPLE TYPE	SAMPLE NO	OTHER TESTS COMMENTS	
0	X				GP	GRANULAR FILL - gravel, poorly g medium grained, damp, brown CLAY (FILL) - gravelly, high plastic stiff, grey, organics			1		
	X				SP	SAND (FILL) - gravelly, poorly grad medium grained, moist, brown			2		
	•				ML	SILT (FILL) - low plastic, damp, sof			3		-
	•				СН	brown			4		
	>			//		TESTPIT TERMINATED AT 3.0m.			5		
											-
	mec [©]	ΔM	IEC Earth & E	nvironme	ntal	LOGGED BY: AH				PLETION DEPTH: 3 m	000
2	MACY		Winnipeg, N	Manitoba		REVIEWED BY: AD Fig. No: 5		_	COM	PLETION DATE: 16 July	2004 ge 1

CLIENT: Imperial Oil Limited		PROJEC	T: Test	pit Progran	1	ВО	REH	DLE NO: TP5	
DRILLER: Hazco					et Selkirk, MB	PR	OJEC	T NO: WX05876	
DRILL/METHOD: Backhoe		<u> </u>				ELI	EVAT	ION:	
	by Tube No Recov			T Test (N)		∏ Spli		Core	
BACKFILL TYPE Bent	onite Pea Grav	el	∭ Dril	Cuttings .	Grout	Ben	tonite	Chips Sand	
(E)	● GASTECH VAPOUR (%LE 20 40 60 1	SOIL SYMBOL	nscs		SOIL SCRIPTION	SAMPLE TYPE	SAMPLE NO	OTHER TESTS COMMENTS	Depth (m)
-1 1 3 4 5 6 7 7 7			CI SP	medium gra CLAY (FILL) moist, grey/ SAND (FILL) moist, brown CLAY - high inclusions) - gravelly, poorly graded, ned, damp, brown - silty, medium to high plastic, black, some sand) - poorly graded, fine grained, n, some silt plastic, moist, brown, sulphate ERMINATED AT 3.0m		1		1
9				TLOG	GGED BY: AH		COM	IPLETION DEPTH: 3 m	
amec®	AMEC Earth & B		ental	RE	/IEWED BY: AD			IPLETION DATE: 16 July 2	
<u>allet</u>	Winnipeg,	wantoba			No: 6				e 1 of 1

	NT: Imperial Oil Limited				estpit Program			OLE NO: TP6	
	LER: Hazco	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	LOCAT	ΓΙΟΝ: 2	87 Main Street Selkirk, MB			CT NO: WX05876	
DRILL	L/METHOD: Backhoe					E	LEVAT	TION:	
SAMF	PLE TYPE Sh	helby Tube No Recov	ery ·	\boxtimes s	PT Test (N) Grab Sample	∭s₁	olit-Pen	Core	
BACK	FILL TYPE Be	entonite Pea Grave	el		orill Cuttings Grout	В	entonite	Chips Sand	
Depth (m)	◆ GASTECH VAPOUR (ppmv) 100 200 300 400	(*) ♦ GASTECH VAPOUR (%LEU 20 40 60 8	L) • 50	SOIL SYMBOL USCS	SOIL DESCRIPTION	DAMDI E TVDE	SAMPLE NO	OTHER TESTS COMMENTS	
0			***************************************	GP ML	ASPHALT GRANULAR FILL - gravelly, poorly medium grained, damp, brown SILT (FILL) - sandy, low plastic, m black, organics	/1	1	-	
-2		•			- grey staining below 1.2m CLAY - high plastic, moist, grey, si	It pockets	2		***************************************
4				СН	- brown below 2.4m		3		
3	•						4		-3
5					TESTPIT TERMINATED AT 3.7m.				5
7									-6
	mec®	AMEC Earth & Er	nvironm	nental	LOGGED BY: AH	-		PLETION DEPTH: 3.7 m	
2	MAM	Winnipeg, M			REVIEWED BY: AD		COM	PLETION DATE: 16 July 2	
		Trinipeg, M		_	Fig. No: 7		1	Page	1 (

APPENDIX C

LAB CERTIFICATES OF ANALYSIS AND DATA QUALITY WAIVER

Data Quality Review Checklist – Imperial Oil Projects (Prelim Monitoring)

Consultant:		AMEC Earth 8	& Environmental	Sampling Da	ate:	30 June 2004
Location:		287 Main Stre	et	Laboratory:		PSC Burnaby
		Selkirk, MB				
Consultant Pro	ject	WX-05876		Sample Sub	mission	08151223
Number:				Number:		
Are all laborat	tory	QC samples	within acceptan	ce criteria?		
			Yes	No	Commen	ts
Instrument surro	gate	recovery	Yes			
Extraction surrog	gate r	ecovery	Yes			
Method Blank C	oncer	ntration	Yes			
Matrix Duplicate	RPD		Yes			
Matrix Spike Red	cover	У	Yes			
Lab Control Sam	nple F	Recovery	Yes			
Are all field Q	C sa	mples within	alert limits?			
		-	Yes	No	Commen	ts
Field Blank Cond	centra	ation	Yes			
Trip Blank Conc	entrat	tion	Yes			
Field Duplicate F	RPD		Yes			
						Yes/No
Has CoA been s	igned	off?				Yes/No Yes
Has CoA been s			atistical control in 0	CoA?		
Has lab warrante	ed all	tests were in st				Yes
Has lab warrante	ed all	tests were in st tests were ana	lyzed following SOF			Yes Yes
Has lab warrante Has lab warrante Were all samples	ed all ed all s ana	tests were in st tests were ana lyzed within ho	lyzed following SOF	P's in CoA?		Yes Yes Yes
Has lab warrante Has lab warrante Were all samples	ed all ed all s ana s sam	tests were in st tests were ana lyzed within ho ples methanol	lyzed following SOF d times? extracted within 48	P's in CoA?	ceipt?	Yes Yes Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo	ed all ed all s ana s sam ody c	tests were in statests were ana lyzed within how ples methanol ompleted and s	lyzed following SOF d times? extracted within 48	P's in CoA?	ceipt?	Yes Yes Yes Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo	ed all ed all s ana s sam ody c	tests were in statests were ana lyzed within how ples methanol ompleted and s	lyzed following SOF ld times? extracted within 48 igned?	P's in CoA?	ceipt?	Yes Yes Yes Yes NA Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo	ed all ed all s ana s sam ody compera	tests were in statests were ana lyzed within houples methanol ompleted and statures acceptables.	lyzed following SOF Id times? extracted within 48 igned? Ile when they reach	P's in CoA?	ceipt?	Yes Yes Yes Yes NA Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo Were sample ter	ed all ed all s ana s sam ody compera	tests were in statests were ana lyzed within houples methanol ompleted and statures acceptables.	lyzed following SOF Id times? extracted within 48 igned? Ile when they reach	P's in CoA? hours from red led lab?	ceipt?	Yes Yes Yes Yes NA Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo Were sample ter Was a Data Qua	ed all ed all s ana s sam ody compera	tests were in statests were ana lyzed within houples methanol ompleted and statures acceptables.	lyzed following SOF Id times? extracted within 48 igned? le when they reach sued? (Yes/No)	P's in CoA? hours from red led lab?	ceipt?	Yes Yes Yes Yes NA Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo Were sample ter Was a Data Qua	ed all ed all s ana s sam ody compera	tests were in statests were ana lyzed within houples methanol completed and statures acceptable.	lyzed following SOF Id times? extracted within 48 igned? le when they reaches sued? (Yes/No) Date of Res	P's in CoA? hours from red led lab?	ceipt?	Yes Yes Yes Yes NA Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo Were sample ter Was a Data Qua Date Issued:	ed all ed all s ana s sam ody compera	tests were in statests were ana lyzed within hospiles methanol ompleted and statures acceptable valver (DQW) is be reliable? (Year	lyzed following SOF Id times? extracted within 48 igned? le when they reach sued? (Yes/No) Date of Reses/No)	P's in CoA? hours from red led lab?	ceipt?	Yes Yes Yes Yes NA Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo Were sample ter Was a Data Qua Date Issued:	ed all ed all s ana s sam ody compera	tests were in statests were ana lyzed within hospiles methanol ompleted and statures acceptable valver (DQW) is be reliable? (Year	lyzed following SOF Id times? extracted within 48 igned? le when they reach sued? (Yes/No) Date of Reses/No)	P's in CoA? hours from red led lab?	ceipt?	Yes Yes Yes Yes NA Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo Were sample ter Was a Data Qua Date Issued:	ed all ed all s ana s sam ody compera	tests were in statests were ana lyzed within holyples methanol completed and statures acceptable value (DQW) is the reliable? (Yestibe and provided the states acceptable)	lyzed following SOF Id times? extracted within 48 igned? le when they reach sued? (Yes/No) Date of Reses/No) de rationale:	P's in CoA? hours from red led lab?	No Yes	Yes Yes Yes Yes NA Yes Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo Were sample ter Was a Data Qua Date Issued: Is data considere If answer is "No"	ed all ed all s ana s sam ody compera	tests were in statests were ana lyzed within hospiles methanol ompleted and statures acceptable valver (DQW) is be reliable? (Year	lyzed following SOF Id times? extracted within 48 igned? le when they reach sued? (Yes/No) Date of Reses/No) de rationale:	P's in CoA? hours from red led lab? sponse:	No Yes	Yes Yes Yes Yes NA Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo Were sample ter Was a Data Qua Date Issued: Is data considere If answer is "No"	ed all ed all s ana s sam ody compera	tests were in statests were ana lyzed within holyples methanol completed and statures acceptable value (DQW) is the reliable? (Yestibe and provided the states acceptable)	lyzed following SOF Id times? extracted within 48 igned? le when they reach sued? (Yes/No) Date of Reses/No) de rationale:	P's in CoA? hours from receled lab? sponse:	No Yes	Yes Yes Yes Yes NA Yes Yes
Has lab warrante Has lab warrante Were all sample: Were all volatiles Is Chain of Custo Were sample ter Was a Data Qua Date Issued: Is data considere If answer is "No" Data Reviewed by:	ed all ed all s ana s sam ody compera	tests were in statests were ana lyzed within holyples methanol completed and statures acceptable value (DQW) is the reliable? (Yestibe and provided the states acceptable)	lyzed following SOF Id times? extracted within 48 igned? le when they reach sued? (Yes/No) Date of Reses/No) de rationale:	P's in CoA? hours from receled lab? sponse:	No Yes	Yes Yes Yes Yes NA Yes Yes

Date samples submitted:	03 July 2004	Date Preliminary results received:	12 July 2004
Date Final C of A received:	17 August 2004	Delivery times in accordance with contract guidelines	No 2

Data Quality Review Checklist - Imperial Oil Projects (UST Removal Program)

Consultant:	AN	MEC Earth	& Enviro	onmental	Sampling Da	ate:	13 July 2004
Location:	28	7 Main Stre	eet		Laboratory:		PSC Burnaby
	_	lkirk, MB					
Consultant Project	: W	X-05876			Sample Sub	mission	08132668
Number:					Number:		
Are all laboratory	/ QC	samples	within	acceptan	ce criteria?		3
				Yes	No	Commen	ts
Instrument surrogate	e reco	very	Yes				
Extraction surrogate	reco	very	Yes				
Method Blank Conce	entrat	ion	Yes			B,T,E dete	ected but <5x MDL
Matrix Duplicate RP	D		Yes				op deserve on de a constant de deserve de la constant de la consta
Matrix Spike Recove	ery		Yes			1	
Lab Control Sample	Reco	very	Yes			41% tolue	ne recovery but spike <2x
		,				blank cond	
Are all field QC s	amp	les within	alert I	imits?			
2				Yes	No	Commen	ts
Field Blank Concent	ration		NA				
Trip Blank Concentra	ation		NA				
Field Duplicate RPD			NA				
							Yes/No
Has CoA been signe	d off	>					Yes
Has lab warranted al			atistical	control in C	nA?		Yes
Has lab warranted al							Yes
Were all samples an					0 111 00/11		Yes
Were all volatiles sar					hours from rec		No
Is Chain of Custody							Yes
Were sample temper			_	they reach	ed lab?		Yes
		<u> </u>					
Was a Data Quality \	Naive	r (DQW) is	sued? (Yes/No)		No	
Date Issued:		()		Date of Res	oonse:	1	
Is data considered to	be re	eliable? (Ye	s/No)			Yes	
If answer is "No", des				nale:			
, , , , , , , , , , , , , , , , , , , ,		p					
Data					Dete		
Reviewed by:	M	chael Bertr	am, P. I	Eng.	Date Reviewed:	2	20 September 2004
Signature:	/	70			1.01.01100.		
	6						
Data complete sub- '	ta di	10 1 1	0004	Date Preli	minary results		

Delivery times in accordance

with contract guidelines?

22 July 2004

No

Date samples submitted:

Date Final C of A

received:

13 July 2004

23 August 2004

Data Quality Review Checklist – Imperial Oil Projects (Test Pit Program)

Consultant:		AMEC Earth 8	& Environmental	Sampling Da	ate:	16 July 2004
Location:		287 Main Stre	et	Laboratory:		PSC Burnaby
		Selkirk, MB				
Consultant Proje	ect	WX-05876		Sample Sub	mission	08132671
Number:				Number:		
Are all laborate	ory (QC samples	within acceptan	ce criteria?		
			Yes	No	Commen	ts
Instrument surrog	gate i	recovery	Yes			
Extraction surroga	ate r	ecovery	Yes			
Method Blank Co	ncer	itration	Yes		B,T,E, F1	detected but <5x MDL
Matrix Duplicate I	RPD		Yes			PD 52.17%, duplicate and ncentrations not >5x MDL
Matrix Spike Reco	OVAT			No		B,T recovery ~200%
Lab Control Samp			Yes	INO		ne recovery but spike <2x
Lab Control Samp	JIE IN	ecovery	res		blank cond	, ,
Are all field QC	sai	mples within	alert limits?			
			Yes	No	Commen	ts
Field Blank Conce	entra	tion	n.a.			
Trip Blank Conce	ntrat	ion	n.a.			*
Field Duplicate RI	PD		n.a.			
·			10.000.000000			
· · · · · · · · · · · · · · · · · · ·				I		
·						Yes/No
Has CoA been sig						Yes
Has lab warranted	d all	tests were in st	atistical control in (Yes Yes
Has lab warranted	d all t	tests were in st tests were ana	yzed following SOI			Yes Yes Yes
Has lab warranted Has lab warranted Were all samples	d all t d all t anal	tests were in st tests were ana yzed within ho	yzed following SOId times?	P's in CoA?		Yes Yes Yes Yes
Has lab warranted Has lab warranted Were all samples Were all volatiles	d all to d all to anal sam	tests were in st tests were ana yzed within ho ples methanol	yzed following SOI d times? extracted within 48	P's in CoA?	eeipt?	Yes Yes Yes Yes
Has lab warranted Has lab warranted Were all samples Were all volatiles Is Chain of Custo	d all d all d anal sam dy co	tests were in statests were ana yzed within ho ples methanol ompleted and s	yzed following SOI d times? extracted within 48 igned?	o's in CoA?	seipt?	Yes Yes Yes Yes Yes
Has lab warranted Has lab warranted Were all samples Were all volatiles Is Chain of Custo	d all d all d anal sam dy co	tests were in statests were ana yzed within ho ples methanol ompleted and s	yzed following SOI d times? extracted within 48	o's in CoA?	seipt?	Yes Yes Yes Yes
Has lab warranted Has lab warranted Were all samples Were all volatiles Is Chain of Custod Were sample tem	d all to all to anal sam dy co	tests were in statests were and yzed within ho ples methanol ompleted and stures acceptab	yzed following SOI d times? extracted within 48 igned? le when they reach	o's in CoA?	eeipt?	Yes Yes Yes Yes Yes
Has lab warranted Has lab warranted Were all samples Were all volatiles Is Chain of Custod Were sample tem Was a Data Quali	d all to all to anal same dy copera	tests were in statests were ana yzed within house methanol completed and stures acceptable.	yzed following SOI d times? extracted within 48 igned? le when they reach sued? (Yes/No)	o's in CoA? hours from reconed lab?	reipt?	Yes Yes Yes Yes Yes Yes Yes Yes
Has lab warranted Has lab warranted Were all samples Were all volatiles Is Chain of Custod Were sample tem Was a Data Quali	d all to all to anal same dy copera	tests were in statests were ana yzed within house methanol completed and stures acceptable.	yzed following SOI d times? extracted within 48 igned? le when they reach	o's in CoA? hours from reconed lab?	eeipt?	Yes Yes Yes Yes Yes Yes Yes Yes
Has lab warranted Has lab warranted Were all samples Were all volatiles Is Chain of Custod Were sample tem Was a Data Quali Date Issued: 2	d all the anal same dy coperate ty W	tests were in statests were ana yzed within house ples methanol completed and stures acceptable aiver (DQW) is by 2004	yzed following SOI d times? extracted within 48 igned? le when they reach sued? (Yes/No) Date of Res	o's in CoA? hours from reconed lab?	reipt?	Yes Yes Yes Yes Yes Yes Yes Yes
Has lab warranted Has lab warranted Were all samples Were all volatiles Is Chain of Custod Were sample tem Was a Data Quali	d all to a ll to b	tests were in statests were analyzed within hoples methanolompleted and stures acceptable aiver (DQW) is ly 2004	yzed following SOI d times? extracted within 48 igned? le when they reach sued? (Yes/No) Date of Reses/No)	o's in CoA? hours from reconed lab?	reipt? Yes 29 July 20	Yes Yes Yes Yes Yes Yes Yes Yes
Has lab warranted Has lab warranted Were all samples Were all volatiles Is Chain of Custod Were sample tem Was a Data Qualid Date Issued: 2	d all to a ll to b	tests were in statests were analyzed within hoples methanolompleted and stures acceptable aiver (DQW) is ly 2004	yzed following SOI d times? extracted within 48 igned? le when they reach sued? (Yes/No) Date of Reses/No)	o's in CoA? hours from reconed lab?	reipt? Yes 29 July 20	Yes Yes Yes Yes Yes Yes Yes Yes
Has lab warranted Has lab warranted Were all samples Were all volatiles Is Chain of Custod Were sample tem Was a Data Qualid Date Issued: 2	d all to a ll to b	tests were in statests were analyzed within hoples methanolompleted and stures acceptable aiver (DQW) is ly 2004	yzed following SOI d times? extracted within 48 igned? ile when they reach sued? (Yes/No) Date of Reses/No) de rationale:	o's in CoA? hours from reconed lab?	eeipt? Yes 29 July 20 Yes	Yes Yes Yes Yes Yes Yes Yes Yes
Has lab warranted Has lab warranted Were all samples Were all volatiles Is Chain of Custod Were sample tem Was a Data Quali Date Issued: 2 Is data considered If answer is "No",	d all to a ll to b	tests were in states were ana yzed within ho ples methanol ompleted and stures acceptable aiver (DQW) is ly 2004 De reliable? (Yearibe and provident provident land land land land land land land land	yzed following SOI d times? extracted within 48 igned? ile when they reach sued? (Yes/No) Date of Reses/No) de rationale:	hours from recorded lab? sponse:	eeipt? Yes 29 July 20 Yes	Yes Yes Yes Yes Yes Yes Yes Yes O4
Has lab warranted Has lab warranted Were all samples Were all volatiles Is Chain of Custod Were sample tem Was a Data Qualit Date Issued: 2 Is data considered If answer is "No", Data Reviewed by:	d all to a ll to b	tests were in states were ana yzed within ho ples methanol ompleted and stures acceptable aiver (DQW) is ly 2004 De reliable? (Yearibe and provident provident land land land land land land land land	yzed following SOI d times? extracted within 48 igned? ile when they reach sued? (Yes/No) Date of Reses/No) de rationale:	hours from recorded lab? sponse:	eeipt? Yes 29 July 20 Yes	Yes Yes Yes Yes Yes Yes Yes Yes O4

Date samples submitted:	17 July 2004	Date Preliminary results received:	23 July 2004
Date Final C of A received:	8 September 2004	Delivery times in accordance with contract guidelines?	No
received.	2004	with contract guidelines?	

Data Quality Review Checklist – Imperial Oil Projects (Intrusive Investigation Program)

Consultant:	AMEC Earth	& Environmental	Sampling Date:		4-6 August 2004
Location:	287 Main Stre	eet	Laboratory:		PSC Burnaby
	Selkirk, MB				-
Consultant Project	WX-05876		Sample Sub	mission	81514512, 81514521
Number:			Number:		
Are all laboratory	QC samples	within acceptan	ce criteria?		
		Yes	No	Commer	its
Instrument surrogate	recovery	Yes			
Extraction surrogate r	ecovery	Yes			
Method Blank Concer	ntration	Yes		B,T detec	ted but <5x MDL
Matrix Duplicate RPD		Yes			
Matrix Spike Recover	У	Yes			
			*		
Lab Control Sample F	Recovery		No	47% ethy	lbenzene recovery
Are all field QC sa	mples within	alert limits?			
		Yes	No	Commen	ts
Field Blank Concentra	ation		No	Benzene	detected at 5x MDL
Trip Blank Concentrat	tion	n.a.			
Field Duplicate RPD		Yes			
			I		
					Yes/No
Has CoA been signed	off?				Yes
Has lab warranted all		atistical control in 0	CoA?		Yes
Has lab warranted all					Yes
Were all samples ana					Yes
Were all volatiles sam			hours from rec		n.a.
Is Chain of Custody co					Yes
Were sample tempera	tures acceptab	le when they reach	ed lab?		Yes
Was a Data Quality W	aiver (DQW) is	sued? (Yes/No)		Yes	
	ctober 2004	Date of Res	ponse:	21 Octobe	r 2004
Is data considered to	be reliable? (Ye	es/No)		Yes	
If answer is "No", desc				000 000 000	
	, , , , , , , , , , , , , , , , , , ,				
Data	Mishada	5.5	Date		
Reviewed by:	Michael Bertr	am, P. Eng.	Reviewed:		20 September 2004
Signature:	20-				

Date samples submitted:	07 August 2004	Date Preliminary results received:	16 August 2004
Date Final C of A received:	21 September 2004	Delivery times in accordance with contract guidelines?	No

Data Quality Review Checklist – Imperial Oil Projects (Return Monitoring)

Consultant:	AMEC Earth	n & Environ	mental	Sampling Date:		30 August 2004
Location:	287 Main St Selkirk, MB	reet		Laboratory:		PSC Burnaby
Consultant Project	WX-05876		ş	Sample Sub	mission	08111246, 08111247
Number:				Number:		
Are all laboratory	QC samples	s within a	cceptar	ce criteria?		
		Y	es	No	Comme	nts
Instrument surrogate	recovery	Yes				
Extraction surrogate r	ecovery	Yes				
Method Blank Concer	ntration	Yes				
Matrix Duplicate RPD		Yes				
Matrix Spike Recover	У	Yes	0			
Lab Control Sample F	Recovery	Yes				
Are all field QC sa			nits?			
			es	No	Comme	nts
Field Blank Concentra	ntion	Yes			-	
Trip Blank Concentrate		Yes				
Field Duplicate RPD		Yes				
Tield Bupileate Ni B		165				
						Yes/No
Has CoA been signed	Loff?					Yes
Has lab warranted all		statistical c	control in	CoA2		Yes
Has lab warranted all		THE COURSE OF THE PARTY OF THE	TO THE RESERVE TO A CONTROL OF THE PROPERTY OF			Yes
Were all samples ana			_			Yes
Were all volatiles sam				hours from red	ceipt?	n.a.
Is Chain of Custody co						Yes
Were sample tempera			they reach	ned lab?		Yes
			-			
Was a Data Quality W	/aiver (DQW)	issued? (Y	es/No)		No	
Date Issued:		D	ate of Res	sponse:		
Is data considered to	be reliable? (Yes/No)			Yes	
If answer is "No", desc	cribe and prov	vide rationa	ile:			
Data	Michael D	-t D =		Date		000
Reviewed by:	Michael Be	rıram, P. E	ng.	Reviewed:		20 September 2004
Signature:	LO_					

Date samples submitted:	30 August 2004	Date Preliminary results received:	9 September 2004
Date Final Cof A received:	15 October 2004	Delivery times in accordance with contract guidelines?	No



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Certificate of Analysis

8577 Commerce Court Burnaby, B.C. Canada V5A 4N5 Tel 604 444 4808 Fax 604 444 4511

Reported To:

AMEC EARTH & ENVIRONMENTAL

Client Code L9

440 DOVERCOURT DRIVE

Attention

: A. DESGROSEILLIERS

WINNIPEG, MB

Phone

: (204) 488-2997

R3Y 1N4

FAX

: (204) 489-8261

Project Information:

Project ID : WX05876

Submitted By: ANDREA HACHKOWSKI

Requisition Forms:

Form 08132668 shipped on 14-Jul-04 received on 15-Jul-04 logged on 16-Jul-04 completed on 23-Jul-04

Remarks:

- All blank values are reported. Associated data are not blank corrected.
- 'MDL' = Method Detection Limit, '<' = Less than MDL, '--' = Not analyzed
- Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
- All CCME and/or BC CSR results met required criteria unless otherwise stated in the report. All data on final reports are validated by technical personnel. Signature on file at laboratory. Deviations from Reference Method for the Canadian-wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method:
 - F1 data None
 - F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction
- All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency
- All analysis data reported was generated when the analytical methods were in statistical control and IOL criteria for spike recoveries, reference material recoveries, method blank data and duplicate precision were met unless otherwise stated
- This report shall not be reproduced except in full, without the written approval of the laboratory

Methods used by PSC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 20th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Liability for any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at PSC for a period of 30 days from receipt of data or as per contract.

PSC Project Manager: Clifton Samoiloff

De Fila



PSC

23-Jul-04

ANALYTICAL REPORT

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Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID :

14035709

14035710

Client ID:

Sampled on:

E17

N7

04/07/13 15:30 04/07/13 14:30

				Cheft ID.	211	*3.5
Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL						
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	3.7	31.3
METALS TO	TAL					
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	2.0	13.0
HYDROCAR	BONS					
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/07/16	04/07/16
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	< 10	140
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	< 10	120
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	< 50	100
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
PHC4HCHT	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes	Yes
VOLATILE (ORGANICS-MAH					
EX995170	Volat. Soil Extract.	date		BTEX SOIL by GCMS SIM	04/07/20	04/07/20
B020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM	0.002	1.1
B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM	0.004	5.0
T001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM	0.018	0.32
X_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM	< 0.1	11
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10	8.4
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10	2.6
VOC SURRO	GATE RECOVERY					
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	84	107
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	104	100
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	99	110
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	83	89
				Matrix :	Soil	Soil
				Matrix :	3011	04/07/12 14 20



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ANALYTICAL REPORT

Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

14035711 14035712 Lab ID : Client ID: **S**3 W12

Sparcode	Parameter	Unit	MDL	Workroute		
				•		
PHYSICAL	T	Calaina	0	Tomoroturo on orrival	1	1
TEMPARRI 00250760	Temperature Arrival Moisture	Celsius %(W/W)	0 0.1	Temperature on arrival Hom: Gravimetric 105C	32.4	33.1
00230700	Moisture	76(W/W)	0.1	110m, Gravmetre 105e	32.4	55.1
METALS TO	TAL					
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	14.1	15.1
HYDROCAR	BONS					
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/07/16	04/07/16
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	320	54
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	290	51
РНС2НСНТ	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	110	< 50
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
РНС4НСНТ	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes	Yes
VOLATILE C	DRGANICS-MAH					
EX995170	Volat. Soil Extract.	date		BTEX SOIL by GCMS SIM	04/07/20	04/07/20
B020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM	1.4	0.062
B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM	8.2	1.4
T001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM	0.72	0.037
X_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM	21 .	1.5
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	12	1.5
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	9.2	< 0.10
VOC SURRO	GATE RECOVERY					
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	104	102
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	98	97
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	105	105
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	114	103
				Matrix :	Soil	Soil

Matrix Soil 04/07/13 13:00 04/07/13 13:30 Sampled on:



23-Jul-04

ANALYTICAL REPORT

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Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID :

14035713

14035714

Client ID:

Sampled on:

E20

EF1

04/07/13 15:45 04/07/13 16:00

				Cheft ID.	LZU	DI I	
Sparcode Parameter		ode Parameter Unit MDL Work		Workroute	oute		
PHYSICAL			0	T	1	1	
ΓEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival		30.8	
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	10.8	30.8	
METALS TO	TAL						
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	2.3	11.0	
HYDROCAR	BONS						
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/07/16	04/07/16	
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	2600	43	
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	2400	41	
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	970	< 50	
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	130	< 50	
PHC4HCHT	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50	< 50	
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes	Yes	
VOLATILE (ORGANICS-MAH						
EX995170	Volat, Soil Extract.	date		BTEX SOIL by GCMS SIM	04/07/20	04/07/20	
B020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM	0.32	0.037	
B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM	27	0.52	
T001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM	3.1	0.055	
X 882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM	160	1.8	
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	120	1.5	
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	40	0.29	
VOC SURRO	GATE RECOVERY						
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	117	106	
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	120	94	
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	103	107	
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	128	103	
				Matrix :	Soil	Soil	
				WINKIX :	04/07/12 15 45	04/07/12 16:00	



750

23-Jul-04

ANALYTICAL REPORT

Page	5	of	11
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Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID :

14035715

14035716

Client ID:

WF3

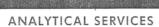
WF2

				Client ID:	WF3	WF2
Sparcode	Parameter	Unit	MDL	Workroute		
Directory						
PHYSICAL	Townsonstans Amirol	Celsius	0	Temperature on arrival	1	1
TEMPARRI 00250760	Temperature Arrival Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	28.9	35.0
00230700	Wolsture	70(11711)	0.1	,		
METALS TO	TAL					
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	S 14.4	14.5
HYDROCAR	RONS					
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/07/16	04/07/16
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	190	410
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	160	380
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	< 50	170
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
РНС4НСНТ	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes	Yes
VOLATILE (ORGANICS-MAH					
EX995170	Volat, Soil Extract.	date		BTEX SOIL by GCMS SIM	04/07/20	04/07/20
B020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM	0.40	1.6
B0201 120 B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM	4.3	6.2
Γ001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM	0.28	3.3
X_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM	23	18
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	16	15
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	6.7	3.4
VOC SLIPPO	OGATE RECOVERY					
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	102	99
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	95	102
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	105	102
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	108	84
					G '1	C-11

Matrix : Sampled on: Soil

04/07/13 16:30 04/07/13 16:45

Soil



23-Jul-04

ANALYTICAL REPORT

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AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Project:	WX058/6			Lab ID : Client ID :	14035717 EF4	14035718 N20
Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL						
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	33.0	32.9
METALS TO	ΓAL					
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	15.4	15.9
HYDROCAR	BONS					
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/07/16	04/07/16
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	36	110
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	33	93
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
PHC4HCHT	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes	Yes
VOLATILE O	RGANICS-MAH					
EX995170	Volat. Soil Extract.	date		BTEX SOIL by GCMS SIM	04/07/20	04/07/20
B020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM	0.077	0.31
B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM	0.40	2.8
T001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM	0.12	1.1
X_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM	2.1	13
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	1.6	10
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	0.46	3.0
	GATE RECOVERY	-			00	105
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	98	105
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	97	94
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	100	103
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	108	80

Matrix Sampled on: Soil

Soil



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DUPLICATE SUMMARY

Parameter	Client ID	Lab ID	Sample Conc.	Duplicate Conc.	MDL	Unit	Relative % Diff.
CCME PHC F2 C10-16	E17	14035709	< 50	< 50	50	ug/g	0.00
CCME PHC F3 C16-34	E17	14035709	< 50	< 50	50	ug/g	0.00
CCME PHC F4 C34-50+	E17	14035709	< 50	< 50	50	ug/g	0.00
Moisture	WF3	14035715	28.9	34.1	0.1	%(W/W)	-16.51





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SPIKE SUMMARY

Parameter	Client ID	Lab ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
CCME PHC F2 C10-16	E17	14035709	< 50	530	467	ug/g	113
CCME PHC F2 C10-16	Blank Spike. Batch:	45700846	< 50	530	450	ug/g	118
CCME PHC F3 C16-34	E17	14035709	< 50	1600	1510	ug/g	106
CCME PHC F3 C16-34	Blank Spike. Batch:	45700846	< 50	1600	1450	ug/g	113
CCME PHC F4 C34-50+	E17	14035709	< 50	120	104	ug/g	116
CCME PHC F4 C34-50+	Blank Spike. Batch:	45700846	< 50	110	100	ug/g	107
Lead	Blank Spike. Batch:	44201865	< 0.1	55.7	50	ug/g	111
Benzene	Blank Spike. Batch:	45202249	0.002	0.041	.043	ug/g	89
Toluene	Blank Spike. Batch:	45202249	0.026	0.044	.043	ug/g	41
Ethylbenzene	Blank Spike. Batch:	45202249	0.006	0.036	.043	ug/g	69
Benzene	Blank Spike. Batch:	45202271	< 0.001	4.2	4.3	ug/g	98
Toluene	Blank Spike. Batch:	45202271	< 0.010	4.4	4.3	ug/g	103
Ethylbenzene	Blank Spike. Batch:	45202271	< 0.003	4.3	4.3	ug/g	100
m,p - Xylene	Blank Spike. Batch:	45202271	< 0.10	8.6	8.6	ug/g	100
o - Xylene	Blank Spike. Batch:	45202271	< 0.10	4.4	4.3	ug/g	102



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ANALYSIS DATES

	Lab ID :	14035709	14035710	14035711	14035712
	Client ID:	E17	N7	S3	W12
00250760	Moisture	19-JUL-2004	19-JUL-2004	19-JUL-2004	19-JUL-2004
Pb-TMS20	Lead	22-JUL-2004	22-JUL-2004	22-JUL-2004	22-JUL-2004
CCMEHCHT	CCME F2-F4 HC'S	19-JUL-2004	19-JUL-2004	19-JUL-2004	19-JUL-2004
PKG-BT35	BTEX SOIL by GCMS SIM	21-JUL-2004	21-JUL-2004	21-JUL-2004	21-JUL-2004
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	13-JUL-2004	13-JUL-2004	13-JUL-2004	13-JUL-2004
	Lab ID :	14035713	14035714	14035715	14035716
	Client ID:	E20	EF1	WF3	WF2
00250760	Moisture	19-JUL-2004	19-JUL-2004	19-JUL-2004	19-JUL-2004
Pb-TMS20	Lead	22-JUL-2004	22-JUL-2004	22-JUL-2004	22-JUL-2004
CCMEHCHT	CCME F2-F4 HC'S	19-JUL-2004	19-JUL-2004	19-JUL-2004	19-JUL-2004
PKG-BT35	BTEX SOIL by GCMS SIM	21-JUL-2004	21-JUL-2004	21-JUL-2004	21-JUL-2004
1 120-0133	brea soil by dems sim	21-JOL-200 4	21-3012-2004	21-101-2004	21-3012-2004
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	13-JUL-2004	13-JUL-2004	13-JUL-2004	13-JUL-2004
	Lab ID :	14035717	14035718		
	Client ID:	EF4	N20		
00250760	Moisture	19-JUL-2004	19-JUL-2004		
Pb-TMS20	Lead	22-JUL-2004	22-JUL-2004		
ССМЕНСНТ	CCME F2-F4 HC'S	19-JUL-2004	19-JUL-2004		
PKG-BT35	BTEX SOIL by GCMS SIM	21-JUL-2004	21-JUL-2004		
	Matrix:	Soil	Soil		
	Sampled on:	13-JUL-2004	13-JUL-2004		



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BATCH NUMBERS

	Lab ID :	14035709	14035710	14035711	14035712
	Client ID:	E17	N7	S3	W12
00250760	Moisture	44402755	44402755	44402755	44402755
Pb-TMS20	Lead	44201865	44201865	44201865	44201865
CCMEHCHT	CCME F2-F4 HC'S	45700846	45700846	45700846	45700846
PKG-BT35	BTEX SOIL by GCMS SIM	45202249	45202249	45202249	45202249
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	13-JUL-2004	13-JUL-2004	13-JUL-2004	13-JUL-2004
	Lab ID :	14035713	14035714	14035715	14035716
	Client ID:	E20	EF1	WF3	WF2
00250760	Moisture	44402755	44402755	44402755	44402755
Pb-TMS20	Lead	44201865	44201865	44201865	44201865
CCMEHCHT	CCME F2-F4 HC'S	45700846	45700846	45700846	45700846
PKG-BT35	BTEX SOIL by GCMS SIM	45202271	45202249	45202249	45202271
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	13-JUL-2004	13-JUL-2004	13-JUL-2004	13-JUL-2004
	Lab ID :	14035717	14035718		
	Client ID:	EF4	N20		
00250760	Moisture	44402755	44402755		
00250760		44402755	44402755		
Pb-TMS20	Lead	45700846	45700846		
CCMEHCHT	CCME F2-F4 HC'S		45202249		
PKG-BT35	BTEX SOIL by GCMS SIM	45202249	43202249		
	Matrix:	Soil	Soil		
	Sampled on:	13-JUL-2004	13-JUL-2004		



23-Jul-04

BLANK SUMMARY

Page 11 of 11

All method blanks were less than MDL, except the following:

Parameter :	Batch	Sparcode	Blank Conc.	MDL	Unit
Benzene	45202249	B020PT20	0.002	0.001	ug/g
Toluene	45202249	T001PT20	0.026	0.010	ug/g
Ethylbenzene	45202249	B021PT20	0.006	0.003	ug/g



EIT

ANALYTICAL SERVICES

Operator: IT

Vial: 9

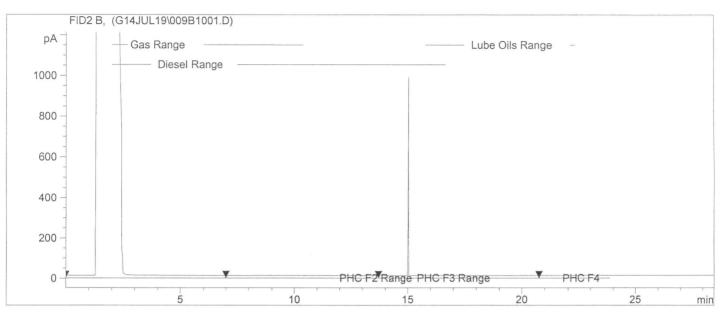
Sequence line#: 10

Sample ID: 35709

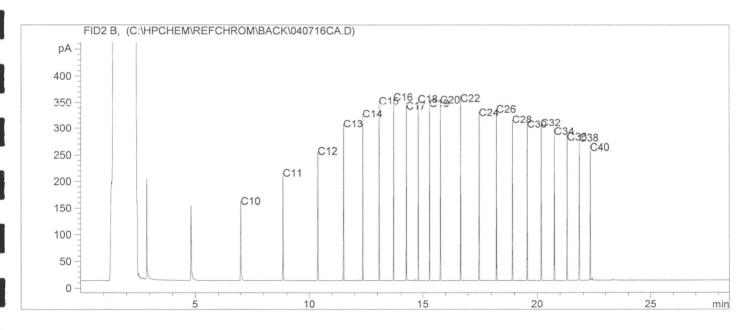
Method File: CCMEWW.M

Date & Time Analyzed: 7/19/2004 11:19:27 PM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



N7

ANALYTICAL SERVICES

Operator: IT Vial: 13

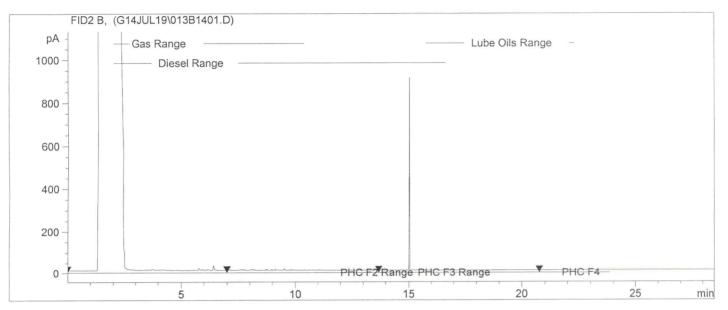
Sequence line#: 14

Sample ID: 35710

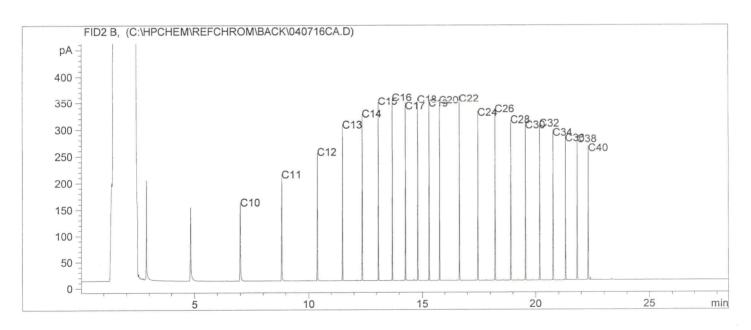
Method File: CCMEWW.M

Date & Time Analyzed: 7/20/2004 2:06:10 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



53

ANALYTICAL SERVICES

Operator: IT Vial: 14

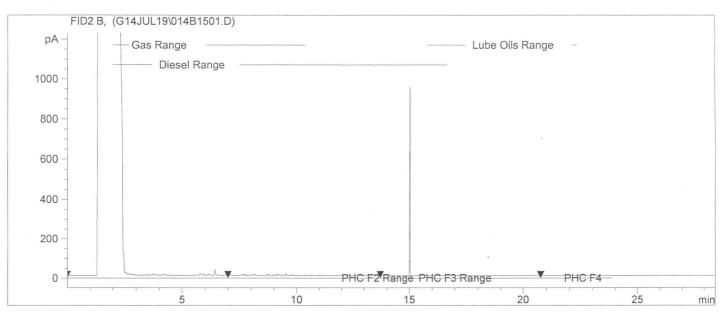
Sequence line#: 15

Sample ID: 35711

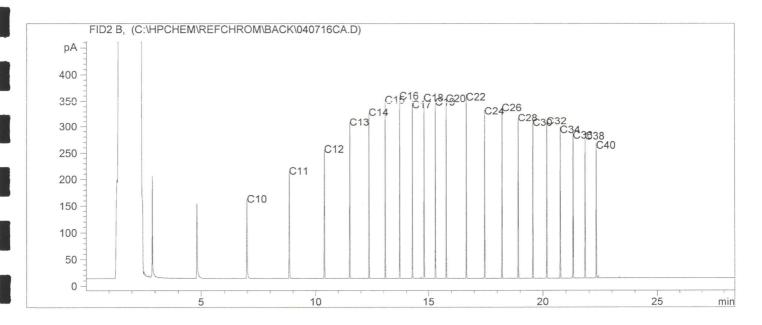
Method File: CCMEWW.M

Date & Time Analyzed: 7/20/2004 2:47:14 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



WIZ

ANALYTICAL SERVICES

Operator: IT Vial: 15

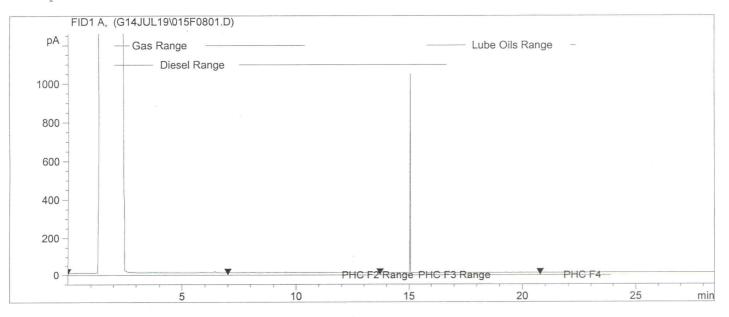
Sequence line#: 8

Sample ID: 35712

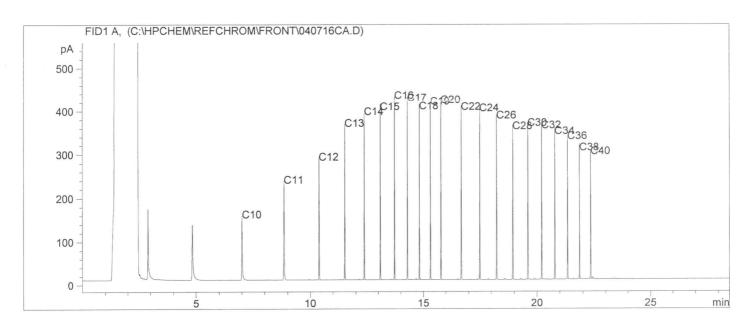
Method File: CCMEWW.M

Date & Time Analyzed: 7/19/2004 9:55:06 PM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4	-	C12
Varsol:	C8	-	C12
Kerosene:	C7	_	C16

Diesel:		C8	-	C22
Lubricating	Oils:	C20	_	C40
Crude Oils:		С3	-	C60+





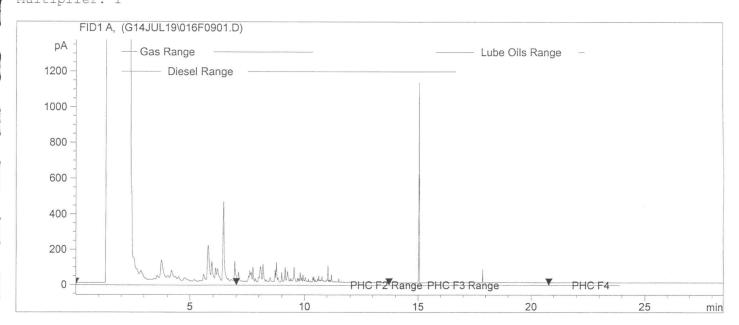
Operator: IT Vial: 16

Sequence line#: 9

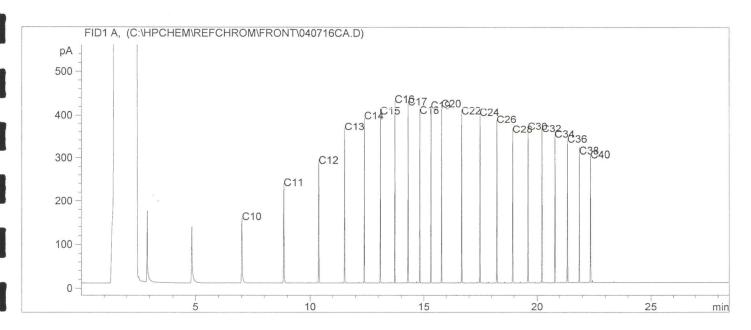
Sample ID: 35713

Method File: CCMEWW.M

Date & Time Analyzed: 7/19/2004 10:37:33 PM Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16





Operator: IT

Vial: 17

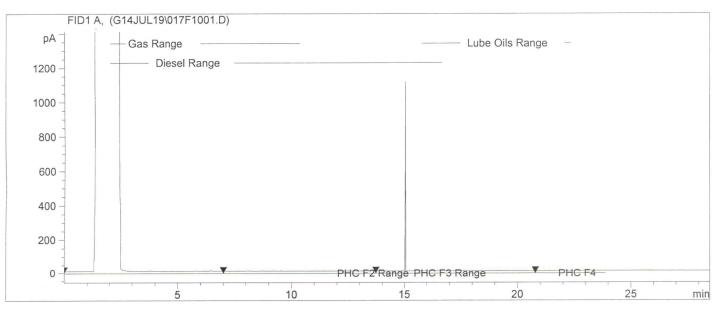
Sequence line#: 10

Sample ID: 35714

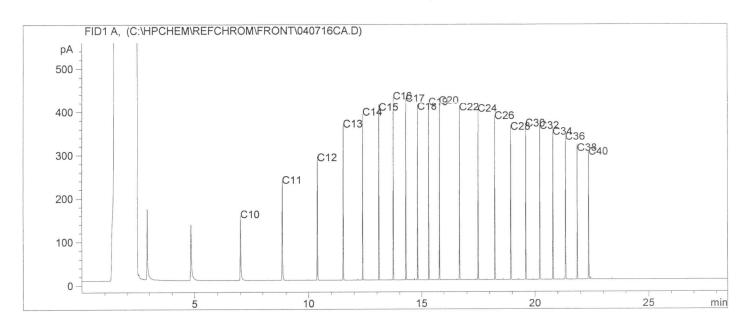
Method File: CCMEWW.M

Date & Time Analyzed: 7/19/2004 11:19:27 PM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



WF3

ANALYTICAL SERVICES

Operator: IT Vial: 18

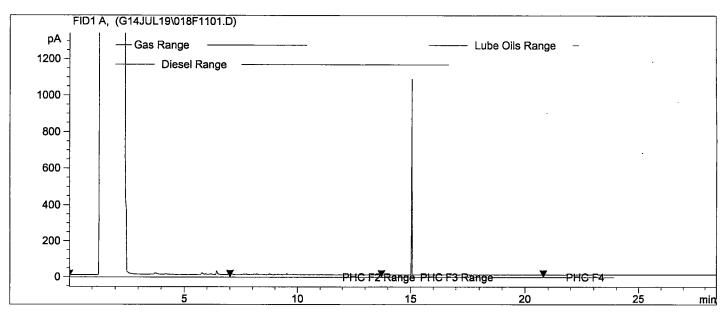
Sequence line#: 11

Sample ID: 35715

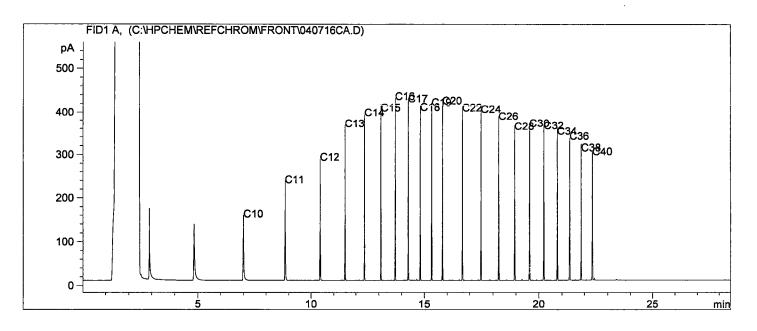
Method File: CCMEWW.M

Date & Time Analyzed: 7/20/2004 12:01:50 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



WFZ

ANALYTICAL SERVICES

Sample ID: 35716

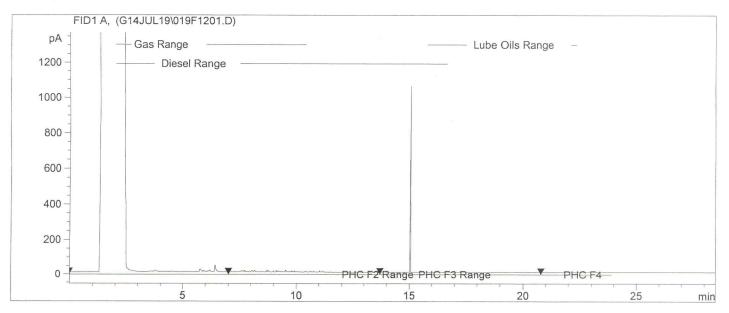
Method File: CCMEWW.M

Date & Time Analyzed: 7/20/2004 12:43:23 AM

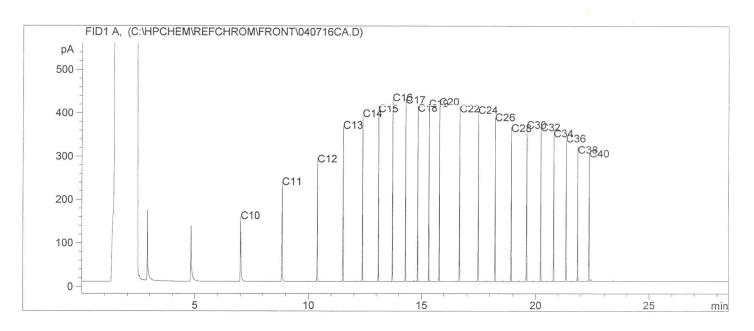
Multiplier: 1

Operator: IT Vial: 19

Sequence line#: 12



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16





Operator: IT Vial: 20

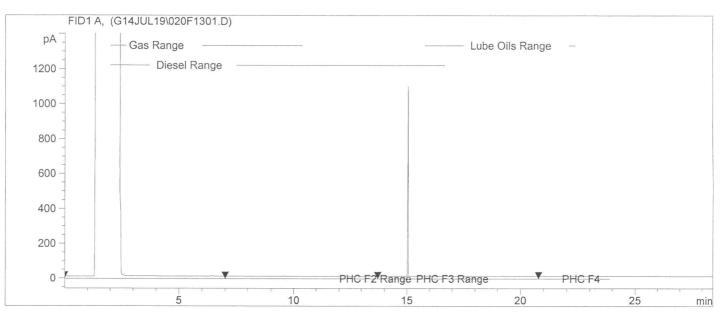
Sequence line#: 13

Sample ID: 35717

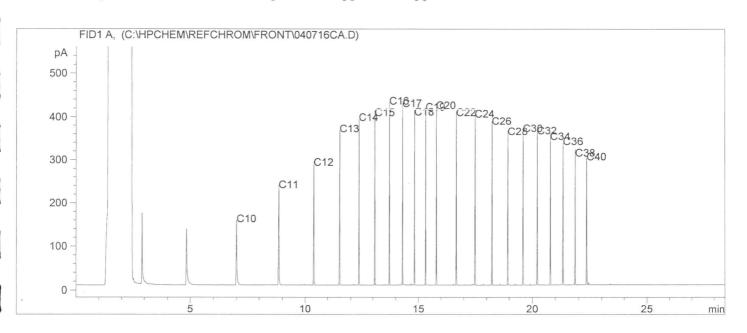
Method File: CCMEWW.M

Date & Time Analyzed: 7/20/2004 1:24:52 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



NZO

ANALYTICAL SERVICES

Operator: IT Vial: 21

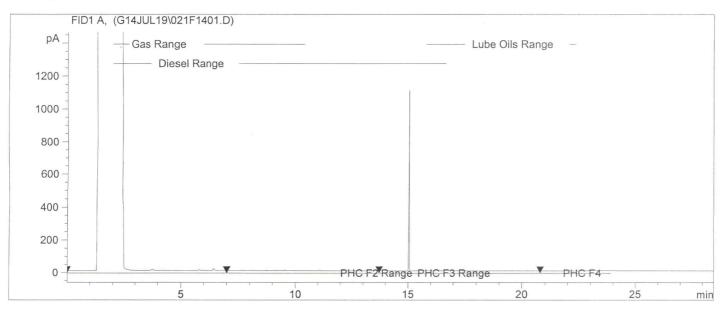
Sequence line#: 14

Sample ID: 35718

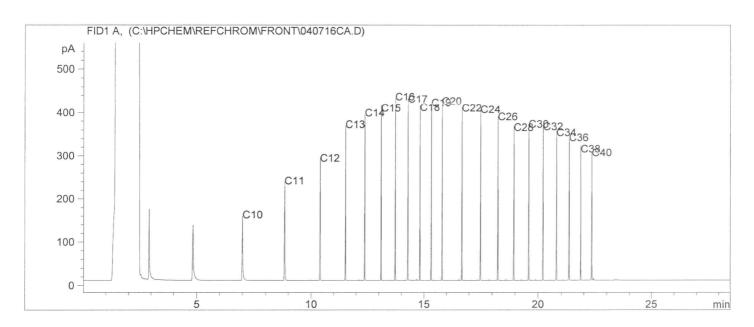
Method File: CCMEWW.M

Date & Time Analyzed: 7/20/2004 2:06:10 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16

PSC A	NA	LY	TI	CA	LS	SEI	RVI	CE	S		SAI	MР	LE	IN	TE	GF	TIS	Y F	RE	CO	RI)	· Th	ne follow	ving	bottl	es w	ere re	eceived fo	r the belo	w proje	ect:		
Client	:	Ø,	41	11	=(Da	te:_	7	ul	y	10	7/	OL	1	_ I	niti	ial:_ <i>H</i>	L/K	_	Со	f C 7	#: <u>815</u>	3-26	71			
9	GLAS	1L AMBER GLASS	1L CLEAR GLASS	1L PLASTIC	500ML AMBER GLASS	250 ML AMBER GLASS	500ML PLASTIC	250ML PLASTIC	250ML PLASTIC FILTERED	250ML PLASTIC HNO3	250ML PLASTIC FILTER/HNO3	250ML PLASTIC H2SO4	250ML PLASTIC FILT/H2SO4	250 ML PLASTIC NaOH	250ML PLASTIC NaOH/ZnAc	Microbiology Bottle	100ml AMBER GLASS H2SO4	40ML AMBER VIALS	40 ml CLEAR VIALS	PLASTIC BAG	AIR SAMPLE	OTHER:	PRESERVATIVE CHECK	1		1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17.		Tem Brok No (C of C of Non Bott Bott Ana Lab Sam Wro Inco Inst inst Inco	c C not signal current C cles listed of the cles in ship lysis Requesting Issumples receiving Bottle(correct Presenticient # officient sa	rees C in Transit tion Incomed/dated b of C on C of C, b ment, but r irements al e (missing/ yed >5 day yed after he	out not on Cobsent/not on Cobsent/not and/or s after sold time. Headspano flag	in sh C of C ot cle incor samp e pace; by coffield)	ear rect) ling presen	nt
11	-	-			-	-			_																			Inst	afficient Sa	imple (lab	use onl	y) ·		
0	Po	urec	of	fan	nior	18	•																		. [8				Ī	'emperat	ure		Aver	age
Con	nme	nts:																							59 C.	Coc	ler#	1	2	12	7	-	2	

		16	emperatui	е	Average
Comments:	Cooler #1	2	2	7	2
	Cooler #2				
	Cooler #3				
	Cooler #4				
	Cooler #5		-		
	Condition of io	ce/ice pa	cks:		

JOB STATUS REPORT

07/23/2004 17:05 PSC ANALYTICAL SERV NAME

FAX# : 604-444-4511 TEL# : 604-444-4808 SER.# : 000004012544

DATE, TIME FAX NO./NAME DURATION PAGE(S) RESULT MODE

07/23 17:04 12044898261 00:01:24 12 OK STANDARD



ANALYTICAL SERVICES

23-Jul-04 Page 1 of 10

R3Y 1N4

Certificate of Analysis

8577 Commerce Court Burnaby, B.C. Canada V5A 4N5 Tel 604 444 4808 Fax 604 444 4511

Reported To:

AMEC EARTH & ENVIRONMENTAL

Client Code L9

440 DOVERCOURT DRIVE WINNIPEG, MB

Attention Phone

: A. DESGROSEILLIERS

FAX

; (204) 488-2997 : (204) 489-8261

Project Information:

Project ID : WX05876

Submitted By: ANDREA HACHKOWSKI

All tests complete. Subject to QA/QC

Requisition Forms:

Form 08132671 shipped on 16-Jul-04 received on 17-Jul-04 logged on 19-Jul-04 completed on 23-Jul-04

Remarks:

- All blank values are reported. Associated data are not blank corrected.
- 'MDL' = Method Detection Limit, '<' = Less than MDL, '--' = Not analyzed Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
- All CCME and/or BC CSR results met required criteria unless otherwise stated in the report, All data on final reports are validated by technical personnel. Signature on file at laboratory. Deviations from Reference Method for the Canadian-wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method:
 - F1 data None
 - F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction
- All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency
- All analysis data reported was generated when the analytical methods were in statistical control and __st_d blook dots and duntions precision

STATE OF THE PROPERTY OF THE P	PSC ANALYTIC 8577 Commerce Co) 444-4808	ESSO / PSC CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUES												ST		PAG	iE_	(OF								
ANALYTICAL SERVICES	Burnaby, B.C. V5	A 4N5	Froll Fre	ax: (604 ee: 1-800) 444-4808) 444-4511)-440-4808											A	VALY	SIS	RE	QUE	EST						8	13	321	67	1
COMPANY NAME:	PH. #:	204 49	383	299	7							T																			
AMEC COMPANY ADDRESS:	FAX #:2	20 4 4 8 PROJECT ID:	9 8	3261	1										S						Щ										
COMPANY ADDRESS:	CLIENT					٦,									GCMS					AIN	SULPHATE										
440 Dovercou WPS, MB	irt WX	.0587	6						ĺ	BIEX)	BTEX)				B⊀					AMMONIA	SULF			(TCLP)	(P)						
1200, MB									2	SO	SBT				PHENOLS		DISSOLVED			AN		KFR)		DT)	(TCLP)						
007) 1.						VPH	(SC)		1	4 PL	2-4) PLUS				PHE		DISS		핍		E	JS (P									
SAMPLER NAME (PRINT):		CT MANAGER:				BTEX /	ORGANICS		3	NS 1	SNS 1 NO				İ			LEVEL	LEVEL	TE	FLUORIDE	SOLIE	WAD	2	7						
Andrea Hachle	rowski A.T	Desaro	sei	llier	S	B B	ORG		Ī	CCME-PHC (FRACTIONS 1-4 PLUS	CCME-PHCS (FRACTIONS 2-4) CCME BTEX (FRACTION 1 PLU				ط ا	IOIAL OIL & GREASE	ASE	1	DISSOLVED METALS	NITRITE	FLU	TOTAL SUSPENDED SOLIDS (NFR)		LEACHABLE LEAD (AA)	EX (AA)						
M. C. Les (Jackson		MATRIX	RS	SA	MPLING		VOC's (VOLATILE	EPH		FRAC	(FRA				PHENOLS BY 4AAP	2 2	MINERAL OIL & GREASE MERCURY TOTAL	TOTALS METALS	MET,			END		LEA	BTE						
FIELD	PSC	3484 348	OTHER # CONTAINERS		TIME		OLA			2	HCS TEX		FLASHPOINT		SBY	JL &	3	MET	VED	101	DE	SUSF	CYANIDE SAD	BLE	BLE						
SAMPLE ID	LAB # (Lab Use Only)	GROUND WATER SURFACE WATER SOIL	OTHER	DATE	TIME ADSP/	BTEX / LH	S's (_ !	VE-P	AE-P	Q	SHP	3,2	NOL	AL A	MINERAL OIL MERCURY	TALS	SOL	NITRATE	CHLORIDE	TAL 9	NID	CHA	LEACHABL					40	
		SUS	0 0	DD/MM/YY	HEA	BTE	000	TEH	PAH	S		LEAD	FLA	PCB's	PHE	2	M M	5	DIS	E	CHI	5	CY	LEA	LEA						
1 TP1@10'	36685	X	.	140/4	Man 19pm	2			\	X																					
102 0 B	36686	X	1		12:30 33%)	X																					
3 TP2 P121	36684	X	1		12:40 60 pm ppn				>	X																					
2 TP208' 3 TP2012' 4 TP3011'	36688	X	1		1:30 10 pm ppm				>			1				\top															T
5 tp4 e 6'	36689	X	1		1148 25 pm ppn	1																									T
6 +0 (010'	36690	X	1		gam 5pm					<																					T
1 TP6 & B1	36691	X	1		LOam tion	0				X	+					†											1			\top	1
-	36992		1		10:15 275	-	-	-		X	-	-				+	_	-							_	+	+		+	+	-
8 TP6@17'	06342		- 1	4	Ppr	~	-	-		4	-	-				+	-	-								+		\vdash		+	+
10			_			+		-			-	-	-			+	+-	-								+	-	\vdash	+	+	-
11		2				+	-	-		+	+	-				+	-	-	-		_					+	+	+	+	+	+
12			_			-	-	-		_		-				+	-	_	-						_	+	-	+	+	+	+
12																		S-BERES			G152246		1850 760	11.00		AVEC E SANSO				230000000	212170000
TAT (Turnaround Time)	ESSO SITE LOCATION	DN: 86026	5/	SPE	CIAL DETECT	ION L	TIMI	rs/c	ONTA	MIN	ANT T	YPE			CCM CSR			ARR	IVAL T	EMPE	RATU	RE °C	17 SK2163	LAB JE D	SCHOOL SECTION	E ONL'	- 100 mm	LOGI	N CHE	FCK	
<5 DAY TAT MUST HAVE PRIOR APPROVAL	Selkirk, MB	98001	942	2											ALBE	ERTA	TIER 1	,	7	~	()	. annuals			3	,	LOGI	/	2011	
* some exceptions apply please contact lab	PSC SAP:													-	OTHI				21	6	16		4	JU	-(Uld	6		X		
STANDARD 10 BUSINESS DAYS □	1104	5///		SPE	CIAL REPORT	ING (JH E	BILLIN	NG INS	STHU	JCTIO	NS		# .	JARS I	USE	D		1	10	1							C	W		
STANDARD 5 BUSINESS DAYS 🗷	ESSO CONTACT:	11 2 - 1	1-		De		11.A	mi	T						10)			L	_ (·	-				july	11				
RUSH 2 BUSINESS DAYS ☐ URGENT 1 BUSINESS DAY ☐	Hogew	Hodalt	15		しつ				11		, ,	TIME	- /		1	_	REC	EIV/F	D BY	<i>/</i> . •	<i>F</i>	,		_	,			-1			
OTHER BUSINESS DAYS	1 banco	SAMPLER:	8			_	ATE D/MM	-	6/0	7/	64	TIME	4/	n	n				G,	The state of the s	20	/ -	E	X							
CUSTODY	RÉLINQUISHED BY						ATE D/MM		1	1		TIME					REC	EIVE	D BY	' :											
REARD	RELINQUISHED BY:					D.	ATE D/MM	1/1	3/0	71	or a	TIME	j	62	5		REC	EIVE	D BY	LAE	BORA	ATOF	Y:	1	4		-		1		

	PSC ANA 8577 Comm			SER')4) 444-4	1000	E	SSO	/P	SC (CHA	IN-	OF-C	CUS	TOD	Y R	EC	ORD	AN	D A	NAL	YSI	S R	EQL	JES1		PA	GE	01	<u> </u>
ANALYTICAL SERVICES	Burnaby, B.0	C. V5/	4N5		F	ax: (60	14) 444-4 100-440-4	1511											ΑN	IALY	'SIS	RE	QUE	ST					8	15	12	23
COMPANY NAME:		PH. #:	20			299		1000			T.		T	T		Т		T	T	T	1		T	ī	T	T	T	П	T	П		TT
AMEC COMPANY ADDRESS:																																
COMPANY ADDRESS:	,	CLIENT	PROJE	CTID	: (#)	326	/											GCMS					-	IATE								
440 Doverco	art	W										BTEX)		1 ×									AMMONIA	SULPHAT					1.			
muiber	(D	w	KO 2		1 2							SB		BTEX)				JLS E		LVE			AMM	S	ê l	[(TCLP)					
COMPANY ADDRESS: 440 DEVERON WINNIPED IN 131/104									퓬	(S)		1-4 PLUS	2-4)	S				PHENOLS BY		DISSOLVED					S (NFR)							
		PROJE	CT MAN	IAGER	1:				BTEX / VPH	ANIC	4	S 1-4	NS 2					<u> </u>			且	LEVEL	ш	RIDE	SCIDS	WAD						
SAMPLER NAME (PRINT): Mark Ro A. Desasose	Theis	Ai	255	210	se:1	lier	5		BTI) H		PAH CCME-PHC (FRACTIONS	CCME-PHCS (FRACTIONS	CCME BTEX (FRACTION 1				U U	101	47 AL	TOTALS METALS LEVE	1 1	NITRITE	FLUORIDI	TOTAL SUSPENDED SOLIDS	3	LEACHABLE LEAD (AA)					
127				TRIX			AMPLING					PAC	(FRA	FRA				PHENOLS BY 4AAP	מחם מחם	MERCURY TOTAL	ALS	DISSOLVED METALS	Z		ENDE		EAL STEX					
FIELD	PSC LAB#		글때병대	_	OTHER # CONTAINERS			ACE	7	VOC's (VOLATILE	5	2	4CS	EX		TNIC		S B√	ء ا ج ا ا	Z C	MET	ED			USPI	CYANIDE SAD	SLE I					
SAMPLE ID	(Lab Use C	only)	GROUND WATER SURFACE	SOIL	OTHER	DATE	TIME	DSP, POUI	直	/s (V	3	<u>п</u>	E-P	E B		FLASHPOINT	ွှ	PHENOLS BY		MERCURY	ALS	SOLV	NITRATE	CHLORIDE	AL S	NDE	LEACHABLE					
			SUS	3	0 0 #	DD/MM/YY		HEADSPACE VAPOUR	BTEX	000	S	CCM	CO	CCN	LEAD	FLAS	PCB's	PHE 1		MER	TOT	DISS	N H	CHL	TOT	CYA	LEAC					
1 mw37	324	34	X		5			240 ppm	X		C	2			X																	
2 MW34	327	35	X		5	4	115	ppm	Χ)	<				X																	
3 MW33	325	360	Y		5	2004	11:30	10	Y	- 1/	×				X	7			\top							1						
4 MW 36	307	107	X		5	4	表 500	ppm 5%	~		K	-	+	+	X	+	+	+	+	+					+	-	-	++				
5 77		2/	1	+	5	476		IEL	X			-	+		/	-	-	+	+	-	+-		-	+	+	+	+	+-+	-			-
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PSC ANALYTICAL SERVICES	SAMPLE INTEGRITY RECOR	D - The following bottles were received for the below project:
Client: MWUL	Date:	Initial: C of C #: 8 3266 8
Comments: Comments Comments	250ML PLASTIC HNO3 250ML PLASTIC HNO3 250ML PLASTIC FILTER/HNO3 250ML PLASTIC HLT/H2SO4 250ML PLASTIC NaOH 250ML PLASTIC NaOH 250ML PLASTIC NaOH/Znac Microbiology Bottle 100ml AMBER GLASS H2SO4 40 ml CLEAR VIALS PLASTIC BAG AIR SAMPLE	Item # 1.

JOB STATUS REPORT

07/22/2004 16:56 PSC ANALYTICAL SERV TIME NAME

: 604-444-4511 FAX# 504-444-4808 TEL# 000004012544 SER.#:

DATE, TIME FAX NO./NAME DURATION PAGE(S) RESULT MODE

07/22 16:54 12044898261 00:01:36 13 OK STANDARD **ECM**



ANALYTICAL SERVICES

22-Jul-04 Page 1 of 11 Interim Report

8577 Commerce Court Burnaby, B.C. Canada V5A 4N5 Tel 604 444 4808 Fax 604 444 4511

Reported To:

AMEC EARTH & ENVIRONMENTAL

Client Code L9

440 DOVERCOURT DRIVE WINNIPEG, MB **R3Y 1N4**

Attention Phone

: A. DESGROSEILLIERS

: (204) 488-2997 : (204) 489-8261 FAX

Project Information:

Project ID : WX05876

Submitted By: ANDREA HACHKOWSKI

Requisition Forms:

Form 08132668 shipped on 14-Jul-04 received on 15-Jul-04 logged on 16-Jul-04

Remarks:

All blank values are reported. Associated data are not blank corrected.
'MDL' = Method Detection Limit, '<' = Less than MDL, '--' = Not analyzed Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease

Organic analyses are not corrected for extraction recovery standards except for Isotope

Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses) All CCME and/or BC CSR results met required criteria unless otherwise stated in the report. All data on final reports are validated by technical personnel. Signature on file at laboratory. Deviations from Reference Method for the Canadian-wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method:

F1 data - None ■ F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction

All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency

All analysis data reported was generated when the analytical methods were in statistical control and marhod blonk data and duplicate precision

All fest complete. Subject to aAlac

	PSC ANA 8577 Comm					604) 444-4	808	E	SS0	/PS	SC C	HAI	N-OF	-Cl	JST	I ODY	RE	COL	RD A	ANE	AI	VAL	YSI	S RI	EQU	EST		P/	AGE .		_ OF	7
ANALYTICAL SERVICES	Burnaby, B.0	C. V5A 4	4N5		Fax: (6	604) 444-4 800-440-4	511										-	ANA	LYS	SIS	REC	QUE	ST					3	31	32	261	68
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PSC Analytical Services Inc. 8577 Commerce Court Burnaby, B.C. Canada V5A 4N5 Tel 604 444 4808 Fax 604 444 4511

INVOICE BC092090

Invoice date 31-JUL-04 Page 1 of 1 Consultant's Copy

Forms included : 08132671 08151223 08132668

Imperial Oil Ltd 237-4TH Avenue S.W. P.O. Box 2480, Stn M Calgary, Alberta

T2P 3M9

Attention of Andrew Hodgetts

Client type : I Client code : L9
Sampler : ANDREA HACHKOWSKI

Client project ID : WX05876
IOL Contract No : 20493
IOL Commitment No : 11045177

Client account # : 6517

No.	Description of work	Factor Basis for factor	Quan tity	Referenc Code	SAP #
1	BTEX-CCME F1 WATER		10	FPKG-BT32 F	W
2	Filtering & PresHNO3		7	SFTPSSPFP F	W
3	Hydrocarbons C5-C10		10	SH104PT11 F	W
4	CCME PHC F2 C10-16		7	SPHC2PHCW F	W
5	Lead Dissolved		7	SPb-DMS31 F	W
6	BTEX SOIL by GCMS SIM		10	FPKG-BT35 S	80
7	CCME-PHC		10	GCCME-PHC S	80
8	Moisture		18	S00250760 S	30
9	Lead		10	SPb-TMS20 S	50
10	CCME F2-F4 HC'S		8	FCCMEHCHT S	80
11	BTEX SOIL by GCMS SIM		8	FPKG-BT35 S	80

Received Between: 05-JUL-2004 and 19-JUL-2004 Reported Between: 12-JUL-2004 and 23-JUL-2004

Consultant : AMEC EARTH & ENVIRONMENTAL

Consultant Contact : A. DESGROSEILLIERS

Consultant Project No.: WX05876

Site Location : 287 MAIN ST 8602651 SELKIRK MB 88001943

TERMS

Net 30 days after date of invoice 2% per month interest charged on all overdue accounts.

Please remit payment to:

PSC Analytical Services Inc.

5555 North Service Road, Burlington, ON, L7L 5H7



IMPERIAL OIL LIMITED / EXXONMOBIL CANADA PSC ANALYTICAL SERVICES CONTRACT

PSC Burnaby

Data Quality Walver Request

100

If this waiver is not returned, or the undersigned PSC Analytical representative not contacted within 14 days of issuance, the laboratory will deem the associated data as acceptable to the recipient, as reported by the laboratory. Please note: If no response has been received within 14 days of issuance, this Data Quality Waiver will be considered incomplete by the laboratory and reported as such to Imperial Oil/ExxonMobil Canada In quarterly stewardship reports.

Client: AMEC Earth & Environment: WX05876 Consultant: AMEC Earth & Consultant: A. Desgroseill:	t Environmental IOL PM: Mike Curtin
IOL Site Location: Customer Samples Affected:	88001943 TP5@12 (PSC ID: 36692)
Date of Deviation: 7/22/2004	Test Affected: BTEX
Reason for Deviation: Benzer concer	ne and toluene spikes exceed acceptance criteria due to high stratiosn of BTEX compounds in the sample.
Walver Issued By: Clifton Samolfoff	Comments:
Data Quality Walver Reviewed Print Name: Allyson Description Signature: A proposed Samples DQW Accepted For: Some samples (#'s/reason):	lies Date: 29 July 2004 All samples



IMPERIAL OIL LIMITED / EXXONMOBIL CANADA PSC ANALYTICAL SERVICES CONTRACT

PSC Burnaby

Data Quality Waiver Request

100

If this waiver is not returned, or the undersigned PSC Analytical representative not contacted within 14 days of issuance, the laboratory will deem the associated data as acceptable to the recipient, as reported by the laboratory. Please note: If no response has been received within 14 days of issuance, this Data Quality Waiver will be considered incomplete by the laboratory and reported as such to Imperial Oil/ExxonMobil Canada in quarterly stewardship reports.

Client: Project:	AMEC WX05	Earth & Envir	Form #: # of Samples		
Consulta	nt:	AMEC Earth	& Environmental	IOL PM:	Mike Curtin
Consulta	nt PM:	A. Desgroseil	liers		
	•				
IOL Site L	ocation:		88001943		
Customer	Sample	s Affected:	TP6@12 (PSC ID: 36	6692)	
Date of De	eviation:	7/22/2004	Test Affected:	BTEX	
DQW Type	e: 5 - Ma	trix Spike value	es outside of acceptance	e limits	
Reason fo	r Deviati	on: Benzen concent	e and toluene spikes ex tratiosn of BTEX compo	ceed acceptance crit ounds in the sample.	eria due to ḥigh
Waiver Is:	sued By		Comments:		
Clifton Sar	moiloff				
Data Qua	ality Wai	ver Reviewed a	and Accepted By:		
Print Nar	ne:		Title	:	
Signatur	e:		Date	e :	
Samples	DQW A	ccepted For:	All samples		
☐ Some	e sample	es (#'s/reason)	· •		
☐ No sa	amples (reason):			



8577 Commerce Court Burnaby, B.C. Canada V5A 4N5

Tel 604 444 4808 Fax 604 444 4511

28-Jul-04 Page 1 of 10 Revision No.: 1

Certificate of Analysis

Reported To:

AMEC EARTH & ENVIRONMENTAL

Client Code L9

440 DOVERCOURT DRIVE

Attention

: A. DESGROSEILLIERS

WINNIPEG, MB

Phone

: (204) 488-2997

R3Y 1N4

FAX

: (204) 489-8261

Project Information:

Project ID

: WX05876

Submitted By: ANDREA HACHKOWSKI

Requisition Forms:

Form 08132671 shipped on 16-Jul-04 received on 17-Jul-04 logged on 19-Jul-04 completed on 24-Jul-04

Remarks:

- All blank values are reported. Associated data are not blank corrected.
- 'MDL' = Method Detection Limit, '<' = Less than MDL, '---' = Not analyzed
- Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
- All CCME and/or BC CSR results met required criteria unless otherwise stated in the report. All data on final reports are validated by technical personnel. Signature on file at laboratory. Deviations from Reference Method for the Canadian-wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method:
 - F1 data None
 - F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction
- All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency
- All analysis data reported was generated when the analytical methods were in statistical control and IOL criteria for spike recoveries, reference material recoveries, method blank data and duplicate precision were met unless otherwise stated
- This report shall not be reproduced except in full, without the written approval of the laboratory

Methods used by PSC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 20th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Liability for any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at PSC for a period of 30 days from receipt of data or as per contract.

PSC Project Manager: Clifton Samoiloff Data Quality Waiver (DQW) Provided.



PSC

28-Jul-04

ANALYTICAL REPORT

Page 2 of 10

Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

PHYSICAL Temperature Arrival Celsius 0 Temperature on arrival 2 2 2 2 2 2 2 2 2					Lab ID : Client ID :	14036685 TP1@10'	14036686 TP2@8'
TEMPARRI Temperature Arrival Celsius %(W/W) 0.1 Hom; Gravimetric 105C 30.6 24.5	Sparcode	Parameter	Unit	MDL	Workroute		
TEMPARRI Temperature Arrival Celsius %(W/W) 0.1 Hom; Gravimetric 105C 30.6 24.5							
HYDROCARBONS	PHYSICAL						
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PHC1PT18	HYDROCAR	BONS					
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PHC4HCHT CCME PHC F4 C34-50+ ug/g 50 CCME F2-F4 High Temp < 50 < 50 < 50	РНС3НСНТ	CCME PHC F3 C16-34		50	CCME F2-F4 High Temp	< 50	< 50
Note	PHC4HCHT	CCME PHC F4 C34-50+		50	CCME F2-F4 High Temp	< 50	< 50
BTEX SOIL by GCMS SIM 04/07/20 04/07/20 BB020PT20 Benzene ug/g 0.001 BTEX SOIL by GCMS SIM 0.005 0.18 B021PT20 Ethylbenzene ug/g 0.003 BTEX SOIL by GCMS SIM 0.024 5.0 T001PT20 Toluene ug/g 0.010 BTEX SOIL by GCMS SIM 0.039 < 0.10 (1) X_882_10 Xylenes ug/g 0.11 BTEX SOIL by GCMS SIM 0.039 < 0.10 (1) X_882_10 Xylene ug/g 0.10 BTEX SOIL by GCMS SIM < 0.1 18 X003PT20 m,p - Xylene ug/g 0.10 BTEX SOIL by GCMS SIM < 0.10 13 X002PT20 o - Xylene ug/g 0.10 BTEX SOIL by GCMS SIM < 0.10 4.7 VOC SURROGATE RECOVERY VS01PT20 Bromofluorobenzene % 0 BTEX SOIL by GCMS SIM 93 104 VS02PT20 d4-1,2-dichloroethane % 0 BTEX SOIL by GCMS SIM 95 100 VS03PT20 d8-Toluene % 0 BTEX SOIL by GCMS SIM 103 98 Ed10PT20 Ethylbenzene-d10 % 60 BTEX SOIL by GCMS SIM 88 88	BASEPHCS	PHC F2-4 BASELINE 0		Yes	Hydrocarbons by GC/FID	Yes	Yes
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VS01PT20 Bromofluorobenzene % 0 BTEX SOIL by GCMS SIM 93 104 VS02PT20 d4-1,2-dichloroethane % 0 BTEX SOIL by GCMS SIM 95 100 VS03PT20 d8-Toluene % 0 BTEX SOIL by GCMS SIM 103 98 Ed10PT20 Ethylbenzene-d10 % 60 BTEX SOIL by GCMS SIM 88 88 Matrix : Soil Soil	VOC SURRO	GATE RECOVERY					
VS02PT20 d4-1,2-dichloroethane % 0 BTEX SOIL by GCMS SIM 95 100 VS03PT20 d8-Toluene % 0 BTEX SOIL by GCMS SIM 103 98 Ed10PT20 Ethylbenzene-d10 % 60 BTEX SOIL by GCMS SIM 88 88 Matrix : Soil Soil			%	0	BTEX SOIL by GCMS SIM	93	104
VS03PT20 d8-Toluene % 0 BTEX SOIL by GCMS SIM 103 98 Ed10PT20 Ethylbenzene-d10 % 60 BTEX SOIL by GCMS SIM 88 88 Matrix : Soil Soil					-		100
Ed10PT20 Ethylbenzene-d10 % 60 BTEX SOIL by GCMS SIM 88 88 Matrix : Soil Soil							98
		Ethylbenzene-d10	%	60		88	88
· · · · · · · · · · · · · · · · · · ·		<u> </u>					
Sampled on: 04/07/16 11:00 04/07/16 11:00							
					Sampled on:	04/07/16 11:00	04/07/16 11:00

Result comments and/or text results:

(1) MDL raised due to sample dilution.



28-Jul-04

ANALYTICAL REPORT

MDL

0

0.1

10

50

50

50

Yes

0.001

0.003

0.010

0.1

0.10

0.10

0

0

0

60

Unit

Celsius

date

ug/g

ug/g

ug/g

ug/g

ug/g

Y/N

date

ug/g

ug/g

ug/g

ug/g

ug/g

ug/g

%

%

%

%

%(W/W)

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Client:

AMEC EARTH & ENVIRONMENTAL

Project:

Sparcode

PHYSICAL

TEMPARRI

HYDROCARBONS

00250760

EX995649

PHC1PT18

HC1-CALC

PHC2HCHT

РНС3НСНТ

PHC4HCHT

BASEPHCS

EX995170

B020PT20

B021PT20

T001PT20

X 882 10

X003PT20

X002PT20

VS01PT20

VS02PT20

VS03PT20

Ed10PT20

WX05876

Parameter

Temperature Arrival

PHC EXT F2 - 4

CCME PHC F1 C6-10

CCME PHC F1-BTEX

CCME PHC F2 C10-16

CCME PHC F3 C16-34

CCME PHC F4 C34-50+

PHC F2-4 BASELINE 0

Volat. Soil Extract.

Bromofluorobenzene

d4-1,2-dichloroethane

Ethylbenzene-d10

Moisture

VOLATILE ORGANICS-MAH

Benzene

Toluene

Xylenes

Ethylbenzene

m,p - Xylene

o - Xylene

d8-Toluene

VOC SURROGATE RECOVERY

Lab ID : Client ID : Workroute	14036687 TP2@12'	14036688 TP3@11'
Temperature on arrival	2	2
Hom; Gravimetric 105C	31.2	29.0
CCME F2-F4 High Temp	04/07/20	04/07/20
CCME F1 by P&T GC/FID	35	< 10
Calculated Result	34	< 10
CCME F2-F4 High Temp	< 50	< 50
CCME F2-F4 High Temp	< 50	< 50
CCME F2-F4 High Temp	< 50	< 50
Hydrocarbons by GC/FID	Yes	Yes
BTEX SOIL by GCMS SIM BTEX SOIL by GCMS SIM	04/07/20 0.50 0.57 0.026 < 0.1 < 0.10	04/07/20 0.005 0.008 0.030 < 0.1 < 0.10

Matrix : Sampled on:

BTEX SOIL by GCMS SIM

Soil 04/07/16 11:00

94

96

104

73

Soil 04/07/16 11:00

90

98

103

88



28-Jul-04

ANALYTICAL REPORT

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Client:

AMEC EARTH & ENVIRONMENTAL

Project:	WX05876			Lab ID :	14036689	14036690
				Client ID:	TP4@6'	TP5@10'
Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL		0.1.	0	T	2	2
TEMPARRI	Temperature Arrival Moisture	Celsius	0 0.1	Temperature on arrival Hom; Gravimetric 105C	2 21.2	2 30.6
00250760	Wolsture	%(W/W)	0.1	Hom; Gravimetric 103C	21.2	30.0
HYDROCAR	BONS					
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/07/20	04/07/20
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	< 10	< 10
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	< 10	< 10
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
PHC4HCHT	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes	Yes
MOLATILE (DOLLY OF MALE					
EX995170	DRGANICS-MAH Volat, Soil Extract.	1.4.		DTEV COIL by COME CIM	04/07/20	04/07/20
B020PT20	Benzene	date	0.001	BTEX SOIL by GCMS SIM BTEX SOIL by GCMS SIM	0.002	0.008
B020PT20 B021PT20	Ethylbenzene	ug/g ug/g	0.001	BTEX SOIL by GCMS SIM	< 0.002	0.008
T001PT20	Toluene	ug/g ug/g	0.003	BTEX SOIL by GCMS SIM	0.029	0.049
X_882_10	Xylenes	ug/g	0.010	BTEX SOIL by GCMS SIM	< 0.1	< 0.1
X_003PT20	m,p - Xylene	ug/g ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10	< 0.10
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10	< 0.10
	,	- 6. 6		•		
VOC SURRO	GATE RECOVERY					
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	91	93
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	100	97
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	103	103
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	103	122
				Matrix :	Soil	Soil
				Sampled on:	04/07/16 11:00	04/07/16 11:00





28-Jul-04

ANALYTICAL REPORT

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Client:

AMEC EARTH & ENVIRONMENTAL

Project:	WX05876			Lab ID : Client ID :	14036691 TP6@8'	14036692 TP6@12
Sparcode	Parameter	Unit	MDL	Workroute	11000	110@12
PHYSICAL						
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	2	2
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	24.2	31.0
HYDROCAR	BONS					
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/07/20	04/07/20
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	2000	250
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	1800	190
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	1200	< 50
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
PHC4HCHT	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes	Yes
VOLATILE (ORGANICS-MAH					
EX995170	Volat. Soil Extract.	date		BTEX SOIL by GCMS SIM	04/07/20	04/07/20
B020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM	1.4	8.5 (1)
B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM	21	4.9
T001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM	12	18 (1)
X_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM	150	30
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	110	21
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	42	8.9
VOC SURRO	GATE RECOVERY					
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	103	96
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	103	98
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	99	99
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	80	84
		-		Matrice	Soil	Soil
				Matrix :	5011	5011

Sampled on:

04/07/16 11:00

04/07/16 11:00

Result comments and/or text results:

⁽¹⁾ Spike invalid due to high sample concentration.



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DUPLICATE SUMMARY

Client ID	Lab ID	Sample Conc.	Duplicate Conc.	MDL	Unit	Relative % Diff.
TP1@10'	14036685	< 50	< 50	50	ug/g	0.00
TP1@10'	14036685	< 50	< 50	50	ug/g	0.00
TP1@10'	14036685	< 50	< 50	50	ug/g	0.00
TP4@6'	14036689	0.002	0.002	0.001	ug/g	0.00
TP4@6'	14036689	0.029	0.017	0.010	ug/g	52.17
TP4@6'	14036689	< 0.003	< 0.003	0.003	ug/g	0.00
TP4@6'	14036689	< 0.10	< 0.10	0.10	ug/g	0.00
TP4@6'	14036689	< 0.10	< 0.10	0.10	ug/g	0.00
TP4@6'	14036689	< 10	. < 10	10	ug/g	0.00
	TP1@10' TP1@10' TP1@10' TP4@6' TP4@6' TP4@6' TP4@6' TP4@6' TP4@6'	TP1@10' 14036685 TP1@10' 14036685 TP1@10' 14036685 TP4@6' 14036689 TP4@6' 14036689 TP4@6' 14036689 TP4@6' 14036689 TP4@6' 14036689	TP1@10' 14036685 < 50 TP1@10' 14036685 < 50 TP1@10' 14036685 < 50 TP1@10' 14036685 < 50 TP4@6' 14036689 0.002 TP4@6' 14036689 < 0.003 TP4@6' 14036689 < 0.003 TP4@6' 14036689 < 0.10 TP4@6' 14036689 < 0.10	Conc. Conc. TP1@10' 14036685 < 50 < 50 TP1@10' 14036685 < 50 < 50 TP1@10' 14036685 < 50 < 50 TP1@6' 14036689 0.002 0.002 TP4@6' 14036689 0.029 0.017 TP4@6' 14036689 < 0.003 < 0.003 TP4@6' 14036689 < 0.10 < 0.10 TP4@6' 14036689 < 0.10 < 0.10	Conc. Conc. TP1@10' 14036685 < 50 < 50 50 TP1@10' 14036685 < 50 < 50 50 TP1@10' 14036685 < 50 < 50 50 TP1@6' 14036689 0.002 0.002 0.001 TP4@6' 14036689 0.029 0.017 0.010 TP4@6' 14036689 < 0.003 < 0.003 0.003 TP4@6' 14036689 < 0.10 < 0.10 0.10 TP4@6' 14036689 < 0.10 < 0.10 0.10	Conc. Conc. TP1@10' 14036685 < 50 < 50 50 ug/g TP4@6' 14036689 0.002 0.002 0.001 ug/g TP4@6' 14036689 0.029 0.017 0.010 ug/g TP4@6' 14036689 < 0.003 < 0.003 0.003 ug/g TP4@6' 14036689 < 0.10 < 0.10 0.10 ug/g TP4@6' 14036689 < 0.10 < 0.10 0.10 ug/g



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SPIKE SUMMARY

Parameter	Client ID	Lab ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
							
CCME PHC F2 C10-16	TP1@10'	14036685	< 50	690	649	ug/g	106
CCME PHC F2 C10-16	Blank Spike. Batch:	45700853	< 50	460	450	ug/g	101
CCME PHC F3 C16-34	TP1@10'	14036685	< 50	2100	2090	ug/g	101
CCME PHC F3 C16-34	Blank Spike. Batch:	45700853	< 50	1400	1450	ug/g	97
CCME PHC F4 C34-50+	TP1@10'	14036685	< 50	160	144	ug/g	114
CCME PHC F4 C34-50+	Blank Spike. Batch:	45700853	< 50	110	100	ug/g	107
Benzene	Blank Spike. Batch :	45202249	0.002	0.041	.043	ug/g	89
Toluene	Blank Spike. Batch:	45202249	0.026	0.044	.043	ug/g	41
Ethylbenzene	Blank Spike. Batch:	45202249	0.006	0.036	.043	ug/g	69
Benzene	TP6@12	14036692	8.5	7.8	.334	ug/g	%-200
Toluene	TP6@12	14036692	. 18	18	.334	ug/g	%-200
Ethylbenzene	TP6@12	14036692	4.9	5.3	.334	ug/g	105
m,p - Xylene	TP6@12	14036692	21	22	.669	ug/g	100
o - Xylene	TP6@12	14036692	8.9	9.3	.334	ug/g	105



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ANALYSIS DATES

	Lab ID :	14036685	14036686	14036687	14036688
	Client ID:	TP1@10'	TP2@8'	TP2@12'	TP3@11'
00250760	Moisture	22-JUL-2004	22-JUL-2004	22-JUL-2004	22-JUL-2004
CCMEHCHT	CCME F2-F4 HC'S	20-JUL-2004	20-JUL-2004	20-JUL-2004	20-JUL-2004
PKG-BT35	BTEX SOIL by GCMS SIM	21-JUL-2004	22-JUL-2004	21-JUL-2004	21-JUL-2004
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	16-JUL-2004	16-JUL-2004	16-JUL-2004	16-JUL-2004
	Lab ID :	14036689	14036690	14036691	14036692
	Client ID:	TP4@6'	TP5@10'	TP6@8'	TP6@12
00250760	Moisture	22-JUL-2004	22-JUL-2004	22-JUL-2004	22-JUL-2004
CCMEHCHT	CCME F2-F4 HC'S	20-JUL-2004	20-JUL-2004	20-JUL-2004	20-JUL-2004
PKG-BT35	BTEX SOIL by GCMS SIM	21-JUL-2004	22-JUL-2004	22-JUL-2004	22-JUL-2004
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	16-JUL-2004	16-JUL-2004	16-JUL-2004	16-JUL-2004





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BATCH NUMBERS

	Lab ID :	14036685	14036686	14036687	14036688
	Client ID:	TP1@10'	TP2@8'	TP2@12'	TP3@11'
00250760	Moisture	44402849	44402849	44402849	44402849
CCMEHCHT	CCME F2-F4 HC'S	45700853	45700853	45700853	45700853
PKG-BT35	BTEX SOIL by GCMS SIM	45202249	45202272	45202249	45202249
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	16-JUL-2004	16-JUL-2004	16-JUL-2004	16-JUL-2004
					,
	Lab ID :	14036689	14036690	14036691	14036692
	Client ID:	TP4@6'	TP5@10'	TP6@8'	TP6@12
00250760	Moisture	44402849	44402849	44402849	44402849
CCMEHCHT	CCME F2-F4 HC'S	45700853	45700853	45700853	45700853
PKG-BT35	BTEX SOIL by GCMS SIM	45202249	45202272	45202272	45202272
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	16-JUL-2004	16-JUL-2004	16-JUL-2004	16-JUL-2004





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BLANK SUMMARY

All method blanks were less than MDL, except the following:

Parameter	Batch	Sparcode	Blank Conc.	MDL	Unit
Benzene	45202249	B020PT20	0.002	0.001	ug/g
Toluene	45202249	T001PT20	0.026	0.010	ug/g
Ethylbenzene	45202249	B021PT20	0.006	0.003	ug/g
CCME PHC F1 C6-10	45202272	PHC1PT18	11	10	ug/g



TP10101

7710

Sample ID: 36685 Method File: CCMEWW.M

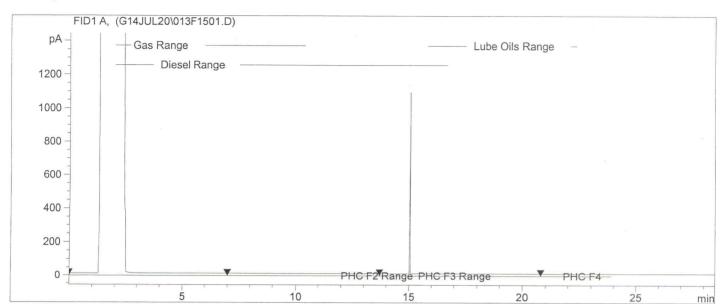
Date & Time Analyzed: 7/20/2004 11:06:36 PM

Multiplier: 1

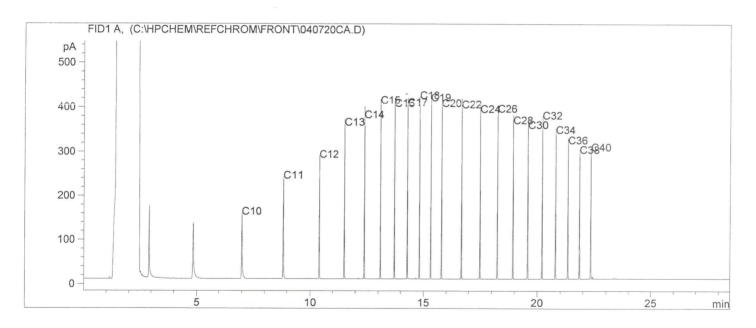
ANALYTICAL SERVICES

Operator: IT

Vial: 13 Sequence line#: 15



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4	-	C12
Varsol:	C8	_	C12
Kerosene:	C7	_	C16

Diesel:		C8	_	C22
Lubricating	Oils:	C20	-	C40
Crude Oils:		C3	-	C60+



TP268'

ANALYTICAL SERVICES

Operator: IT Vial: 16

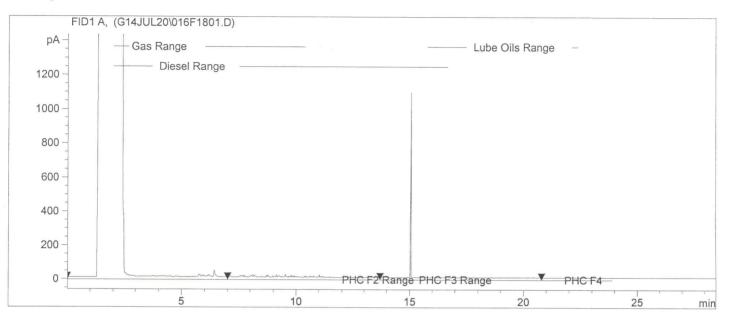
Sequence line#: 18

Sample ID: 36686

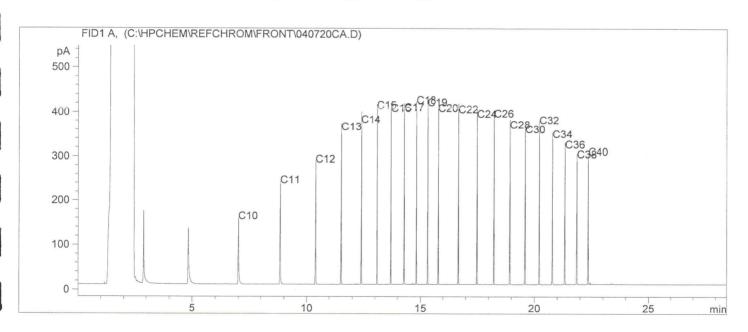
Method File: CCMEWW.M

Date & Time Analyzed: 7/21/2004 1:09:21 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



TP2@12'

ANALYTICAL SERVICES

Sample ID: 36687

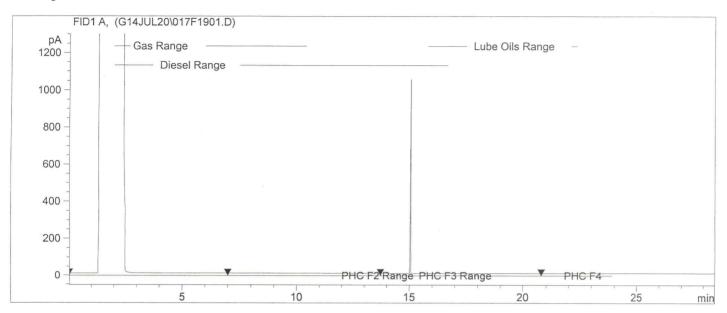
Method File: CCMEWW.M

Date & Time Analyzed: 7/21/2004 1:49:56 AM

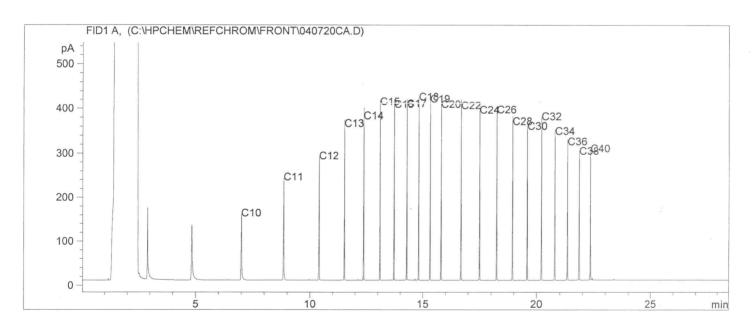
Multiplier: 1

Operator: IT Vial: 17

Sequence line#: 19



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



TP3@11'

ANALYTICAL SERVICES

Operator: IT Vial: 18

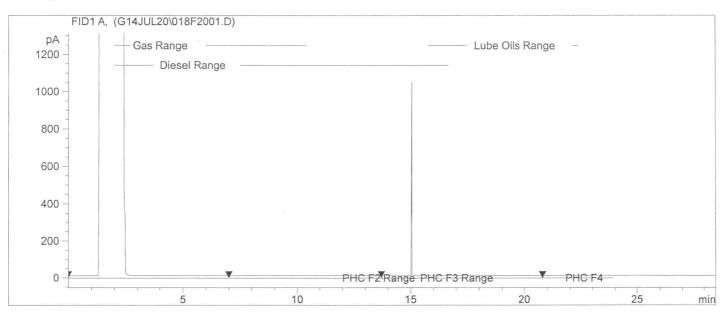
Sequence line#: 20

Sample ID: 36688

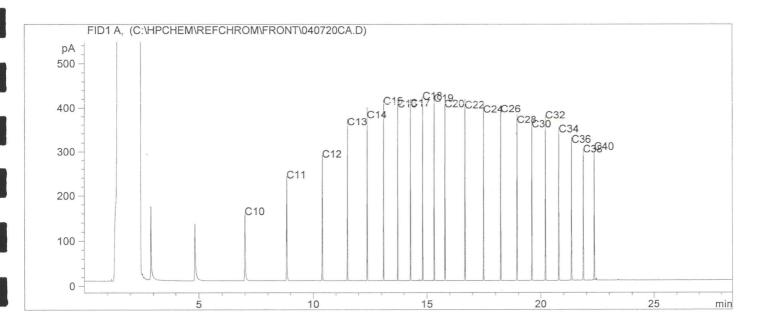
Method File: CCMEWW.M

Date & Time Analyzed: 7/21/2004 2:30:20 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



TP4061

ANALYTICAL SERVICES

Sample ID: 36689

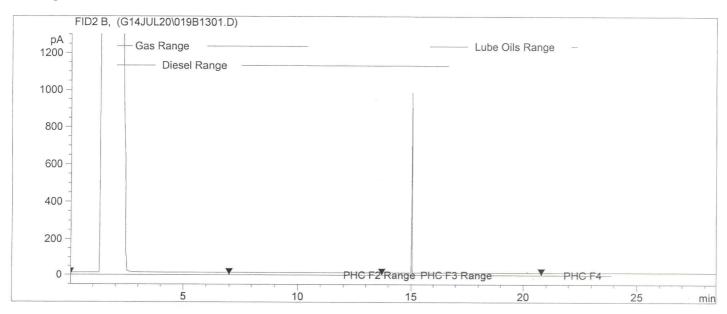
Method File: CCMEWW.M

Date & Time Analyzed: 7/20/2004 10:25:11 PM

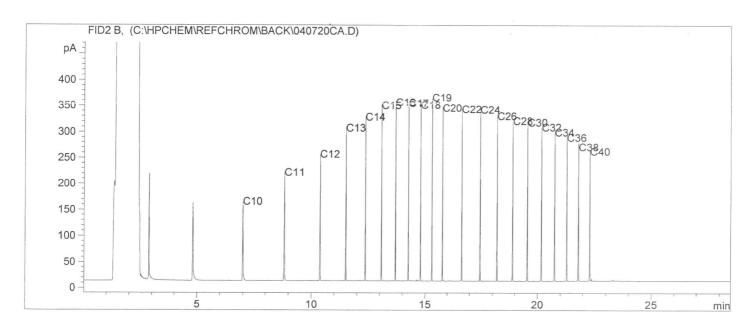
Multiplier: 1

Operator: IT Vial: 19

Sequence line#: 13



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



TP5010'

ANALYTICAL SERVICES

Operator: IT Vial: 20

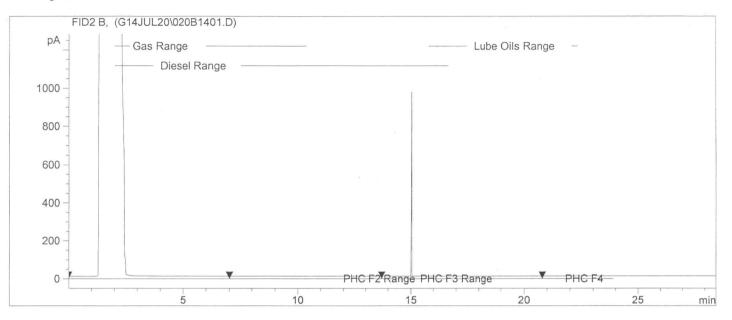
Sequence line#: 14

Sample ID: 36690

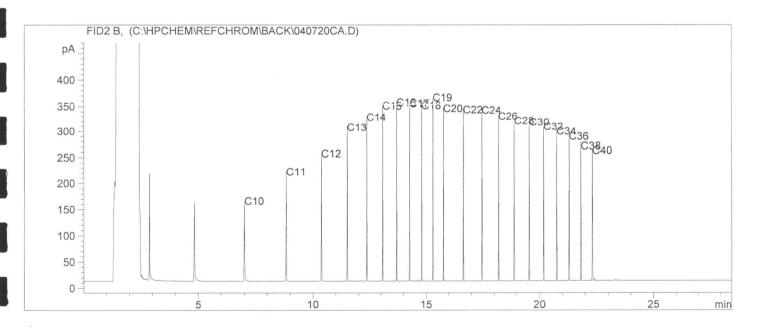
Method File: CCMEWW.M

Date & Time Analyzed: 7/20/2004 11:06:36 PM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



TP6081

ANALYTICAL SERVICES

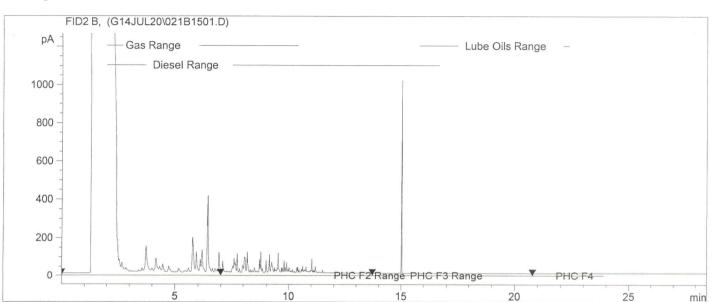
Sample ID: 36691

Method File: CCMEWW.M

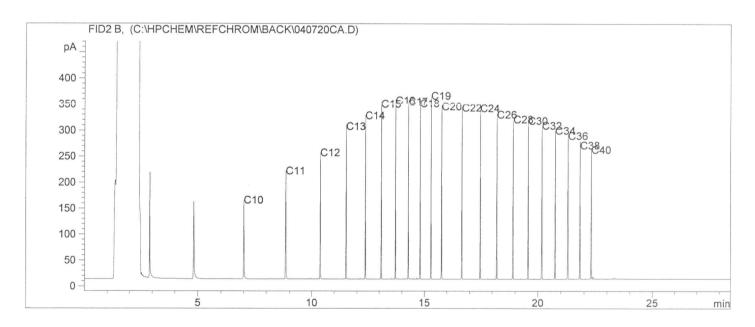
Date & Time Analyzed: 7/20/2004 11:47:42 PM

Multiplier: 1

Operator: IT Vial: 21 Sequence line#: 15



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



TP60121

ANALYTICAL SERVICES

Operator: IT Vial: 22

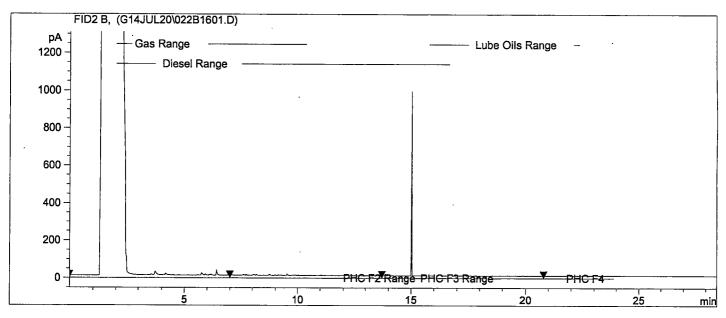
Sequence line#: 16

Sample ID: 36692

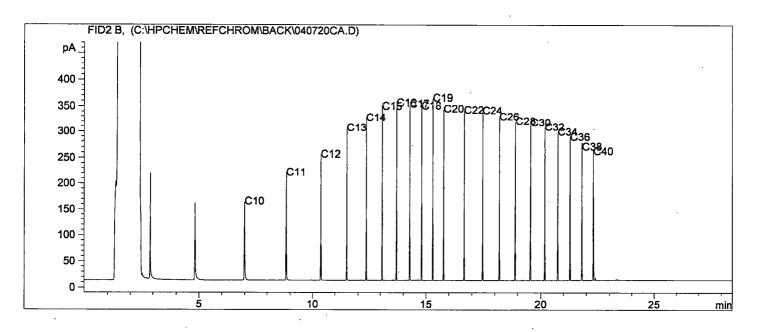
Method File: CCMEWW.M

Date & Time Analyzed: 7/21/2004 12:28:41 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



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Certificate of Analysis

8577 Commerce Court Burnaby, B.C. Canada V5A 4N5 Tel 604 444 4808 Fax 604 444 4511

Reported To:

AMEC EARTH & ENVIRONMENTAL

Client Code L9

440 DOVERCOURT DRIVE

Attention

: A. DESGROSEILLIERS

WINNIPEG, MB

Phone

: (204) 488-2997

R3Y 1N4

FAX

: (204) 489-8261

Project Information:

Project ID

: WX05876

Submitted By: MARK RODDY

Requisition Forms:

Form 08151223 shipped on 02-Jul-04 received on 03-Jul-04 logged on 5-Jul-04 completed on 12-Jul-04

Remarks:

- All blank values are reported. Associated data are not blank corrected.
- 'MDL' = Method Detection Limit, '<' = Less than MDL, '---' = Not analyzed
- Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
- All CCME and/or BC CSR results met required criteria unless otherwise stated in the report. All data on final reports are validated by technical personnel. Signature on file at laboratory. Deviations from Reference Method for the Canadian-wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method:
 - F1 data None
 - F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction
- All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency
- All analysis data reported was generated when the analytical methods were in statistical control and IOL criteria for spike recoveries, reference material recoveries, method blank data and duplicate precision were met unless otherwise stated
- This report shall not be reproduced except in full, without the written approval of the laboratory

Methods used by Philip are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 20th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Liability for any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at Philip for a period of 30 days from receipt of data or as per contract.

PHILIP Project Manager: Clifton Samoiloff

Per:





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ANALYTICAL REPORT Form 08151223

Client : Project :	AMEC EARTH & ENVIRONMI WX05876	ENTAL		Lab ID :	14032734	14032735
				Client ID:	MW37	MW34
Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL						
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	2	2
METALS DIS	SSOLVED					
Pb-DMS31	Lead Dissolved	mg/L	0.0005	Dissolved Waters:ICP/MS	< 0.0005	< 0.0005
HYDROCAR	BONS					
H104PT11	Hydrocarbons C5-C10	mg/L	0.10	BTEX by GC/MS 8260	4.8	23
EX995641	TEH Extraction-Water	date		Hydrocarbons by GC/FID	04/07/07	04/07/07
PHC1PT17	CCME PHC F1 C6-10	mg/L	0.1	CCME F1 by P&T GC/FID	3.0	16
HC1-CAL1	CCME PHC F1-BTEX	mg/L		Calculated Result	1.2	3.6
PHC2PHCW	CCME PHC F2 C10-16	mg/L	0.1	Hydrocarbons by GC/FID	0.3	0.3
VOLATILE C	DRGANICS-MAH					
EX995172	Volat. Wat. Pre-Scr.	date		BTEX by GC/MS 8260	04/07/06	04/07/06
B020PT11	Benzene	ug/L	0.5	BTEX by GC/MS 8260	1100	6000
B021PT11	Ethylbenzene	ug/L	0.5	BTEX by GC/MS 8260	290	370
T001PT11	Toluene	ug/L	0.5	BTEX by GC/MS 8260	37	3500
X_8842_5	Xylenes	ug/L	0.5	Calculated Result	380	2600
X003PT11	m,p - Xylene	ug/L	0.5	BTEX by GC/MS 8260	350	1700
X002PT11	o - Xylene	ug/L	0.5	BTEX by GC/MS 8260	31	880
VOC SURRO	GATE RECOVERY					
VS01PT11	Bromofluorobenzene	%	0	BTEX by GC/MS 8260	98	98
VS02PT11	d4-1,2-dichloroethane	%	0	BTEX by GC/MS 8260	96	97
VS03PT11	d8-Toluene	%	0	BTEX by GC/MS 8260	99	98
				Matrix :	Water	Water
				Sampled on:	04/06/30 11:00	04/06/30 11:15



PSC

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ANALYTICAL REPORT Form 08151223

Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

,				Lab ID : Client ID :	14032736 MW33	14032737 MW36
Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL		70000 000 000	Town	Message St. Co.		
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	2	2
METALS DI	SSOLVED					
Pb-DMS31	Lead Dissolved	mg/L	0.0005	Dissolved Waters:ICP/MS	< 0.0005	< 0.0005
HYDROCAR	BONS					
H104PT11	Hydrocarbons C5-C10	mg/L	0.10	BTEX by GC/MS 8260	< 0.10	8.5
EX995641	TEH Extraction-Water	date		Hydrocarbons by GC/FID	04/07/07	04/07/07
PHC1PT17	CCME PHC F1 C6-10	mg/L	0.1	CCME F1 by P&T GC/FID	< 0.1	5.7
HC1-CAL1	CCME PHC F1-BTEX	mg/L		Calculated Result	< 0.1	1.0
PHC2PHCW	CCME PHC F2 C10-16	mg/L	0.1	Hydrocarbons by GC/FID	< 0.1	0.2
VOLATILE (DRGANICS-MAH					
EX995172	Volat. Wat. Pre-Scr.	date		BTEX by GC/MS 8260	04/07/06	04/07/06
B020PT11	Benzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	4200
B021PT11	Ethylbenzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	250
T001PT11	Toluene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	52
X_8842_5	Xylenes	ug/L	0.5	Calculated Result	< 0.5	270
X003PT11	m,p - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	270
X002PT11	o - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 25 (1)
VOC SURRO	GATE RECOVERY					
VS01PT11	Bromofluorobenzene	%	0	BTEX by GC/MS 8260	91	93
VS02PT11	d4-1,2-dichloroethane	%	0	BTEX by GC/MS 8260	105	93
VS03PT11	d8-Toluene	%	0	BTEX by GC/MS 8260	96	97
				Matrix :	Water	Water
				Sampled on:	04/06/30 11:30	04/06/30 12:00

Result comments and/or text results:

(1) MDL raised due to sample dilution.





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ANALYTICAL REPORT Form 08151223

Client : Project :	AMEC EARTH & ENVIRO WX05876	ONMENTAL				
Project:	WA038/0			Lab ID : Client ID :	14032738 MW32	14032739 MW38
Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL						
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	2	2
METALS DIS	SSOLVED					
Pb-DMS31	Lead Dissolved	mg/L	0.0005	Dissolved Waters:ICP/MS	< 0.0005	< 0.0005
HYDROCAR	BONS					
H104PT11	Hydrocarbons C5-C10	mg/L	0.10	BTEX by GC/MS 8260	< 0.10	< 0.10
EX995641	TEH Extraction-Water	date		Hydrocarbons by GC/FID	04/07/07	04/07/07
PHC1PT17	CCME PHC F1 C6-10	mg/L	0.1	CCME F1 by P&T GC/FID	< 0.1	< 0.1
HC1-CAL1	CCME PHC F1-BTEX	mg/L		Calculated Result	< 0.1	< 0.1
PHC2PHCW	CCME PHC F2 C10-16	mg/L	0.1	Hydrocarbons by GC/FID	< 0.1	< 0.1
VOLATILE C	PRGANICS-MAH					
EX995172	Volat. Wat. Pre-Scr.	date		BTEX by GC/MS 8260	04/07/06	04/07/06
B020PT11	Benzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5
B021PT11	Ethylbenzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5
T001PT11	Toluene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5
X_8842_5	Xylenes	ug/L	0.5	Calculated Result	< 0.5	< 0.5
X003PT11	m,p - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5
X002PT11	o - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5
VOC SURRO	GATE RECOVERY					
VS01PT11	Bromofluorobenzene	%	0	BTEX by GC/MS 8260	90	88
VS02PT11	d4-1,2-dichloroethane	%	0	BTEX by GC/MS 8260	101	99
VS03PT11	d8-Toluene	%	0	BTEX by GC/MS 8260	97	96
				Matrix :	Water	Water
					04/06/30 11:45	04/06/30 12:15
				Sampled on:	04/00/30 11:45	04/00/30 12:13



750

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ANALYTICAL REPORT Form 08151223

Client :

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

-	•			Lab ID : Client ID :	14032740 BH10	14032741 DUPLICATE
Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL						
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	2	2
METALS DIS	SSOLVED					
Pb-DMS31	Lead Dissolved	mg/L	0.0005	Dissolved Waters:ICP/MS	< 0.0005	
HYDROCARI	BONS					
H104PT11	Hydrocarbons C5-C10	mg/L	0.10	BTEX by GC/MS 8260	3.8	16
EX995641	TEH Extraction-Water	date		Hydrocarbons by GC/FID	04/07/07	
PHC1PT17	CCME PHC F1 C6-10	mg/L	0.1	CCME F1 by P&T GC/FID	2.2	9.0
HC1-CAL1	CCME PHC F1-BTEX	mg/L		Calculated Result	1.6	< 0.1
PHC2PHCW	CCME PHC F2 C10-16	mg/L	0.1	Hydrocarbons by GC/FID	0.3	
VOLATILE O	RGANICS-MAH					
EX995172	Volat. Wat. Pre-Scr.	date		BTEX by GC/MS 8260	04/07/06	04/07/06
B020PT11	Benzene	· ug/L	0.5	BTEX by GC/MS 8260	490	4600
B021PT11	Ethylbenzene	ug/L	0.5	BTEX by GC/MS 8260	57	220
F001PT11	Toluene	ug/L	0.5	BTEX by GC/MS 8260	4.4	2500
X_8842_5	Xylenes	ug/L	0.5	Calculated Result	31	1700
X003PT11	m,p - Xylene	ug/L	0.5	BTEX by GC/MS 8260	31	1100
X002PT11	o - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	600
VOC SURRO	GATE RECOVERY					
VS01PT11	Bromofluorobenzene	%	0	BTEX by GC/MS 8260	108	95
VS02PT11	d4-1,2-dichloroethane	%	0	BTEX by GC/MS 8260	94	92 .
VS03PT11	d8-Toluene	%	0	BTEX by GC/MS 8260	98	94
				Matrix :	Water	Water
				Sampled on:	04/06/30 12:30	04/06/30 12:0:





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ANALYTICAL REPORT Form 08151223

Client : Project :	AMEC EARTH & ENVIRO	ONMENTAL				
Project:	WA03870			Lab ID : Client ID :	14032742 FIELD BLANK	14032743 TRIP BLANK
Sparcode	Parameter	Unit	MDL	Workroute		

PHYSICAL					`	
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	2	2
IIVDDOCAT	DONG					
HYDROCAF H104PT11	Hydrocarbons C5-C10	mg/L	0.10	BTEX by GC/MS 8260	< 0.10	< 0.10
PHC1PT17	CCME PHC F1 C6-10	mg/L	0.10	CCME F1 by P&T GC/FID	< 0.10	< 0.10
HC1-CAL1	CCME PHC F1-BTEX	mg/L	0.1	Calculated Result	< 0.1	< 0.1
ner-entr	COMBTHETTBIEA	mg/ L		Caronated Result		
VOLATILE	ORGANICS-MAH					
EX995172	Volat. Wat. Pre-Scr.	date		BTEX by GC/MS 8260	04/07/06	04/07/06
B020PT11	Benzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5
B021PT11	Ethylbenzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5
T001PT11	Toluene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5
X_8842_5	Xylenes	ug/L	0.5	Calculated Result	< 0.5	< 0.5
X003PT11	m,p - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5
X002PT11	o - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5
VOC SURRO	OGATE RECOVERY					
VS01PT11	Bromofluorobenzene	%	0	BTEX by GC/MS 8260	88	89
VS02PT11	d4-1,2-dichloroethane	%	0	BTEX by GC/MS 8260	93	104
VS03PT11	d8-Toluene	%	0	BTEX by GC/MS 8260	98	94
				Mari	W	Water
				Matrix :	Water	
				Sampled on:	04/06/30 12:05	04/07/05 16:00



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DUPLICATE SUMMARY Form 08151223

Parameter	Client ID	Lab ID	Sample Conc.	Duplicate Conc.	MDL	Unit	Relative % Diff.
Benzene	MW32	14032738	< 0.5	< 0.5	0.5	ug/L	0.00
Toluene	MW32	14032738	< 0.5	< 0.5	0.5	ug/L	0.00
Ethylbenzene	MW32	14032738	< 0.5	< 0.5	0.5	ug/L	0.00
m,p - Xylene	MW32	14032738	< 0.5	< 0.5	0.5	ug/L	0.00
o - Xylene	MW32	14032738	< 0.5	< 0.5	0.5	ug/L	0.00
CCME PHC F1 C6-10	MW32	14032738	< 0.1	< 0.1	0.1	mg/L	0.00
Hydrocarbons C5-C10	MW32	14032738	< 0.10	< 0.10	0.10	mg/L	0.00
Lead Dissolved	BH10	14032740	< 0.0005	< 0.0005	0.0005	mg/L	0.00





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SPIKE SUMMARY Form 08151223

Parameter	Client ID	Lab ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
					<u> </u>		
Benzene	Blank Spike. Batch:	45202063	< 0.5	9.7	10	ug/L	97
Toluene	Blank Spike. Batch:	45202063	< 0.5	9.7	10	ug/L	97
Ethylbenzene	Blank Spike. Batch:	45202063	< 0.5	9.2	10	ug/L	92
m,p - Xylene	Blank Spike. Batch:	45202063	< 0.5	18	20	ug/L	91
o - Xylene	Blank Spike. Batch:	45202063	< 0.5	9.6	10	ug/L	96
Lead Dissolved	Blank Spike. Batch:	44201710	< 0.0005	0.0217	.02	mg/L	108
CCME PHC F2 C10-16	Blank Spike. Batch:	45700801	< 0.1	3.3	4.24	mġ/L	78
Benzene	MW38	14032739	< 0.5	10	10	ug/L	102
Toluene	MW38	14032739	< 0.5	9.8	10	ug/L	98
Ethylbenzene	MW38	14032739	< 0.5	8.9	10	ug/L	89
m.p - Xylene	MW38	14032739	< 0.5	18	20	ug/L	90
o - Xylene	MW38	14032739	< 0.5	9.6	10	ug/L	96
Benzene	Blank Spike. Batch:	45202084	< 0.5	10	10	ug/L	104
Lead Dissolved	вн10	14032740	< 0.0005	0.0741	.074	mg/L	100
Toluene	Blank Spike. Batch:	45202084	< 0.5	11	10	ug/L	106
Ethylbenzene	Blank Spike. Batch:	45202084	< 0.5	10	10	ug/L	102
m,p - Xylene	Blank Spike. Batch:	45202084	< 0.5	21	20	ug/L	104
o - Xylene	Blank Spike. Batch:	45202084	< 0.5	11	10	ug/L	109





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ANALYSIS DATES Form 08151223

	Lab ID :	14032734	14032735	14032736	14032737
	Client ID:	MW37	MW34	MW33	MW36
Pb-DMS31	Lead Dissolved	06-JUL-2004	06-JUL-2004	06-JUL-2004	06-JUL-2004
H104PT11	Hydrocarbons C5-C10	08-JUL-2004	08-JUL-2004	08-JUL-2004	08-JUL-2004
PHC2PHCW	CCME PHC F2 C10-16	08-JUL-2004	08-JUL-2004	08-JUL-2004	08-JUL-2004
PKG-BT32	BTEX-CCME F1 WATER	08-JUL-2004	08-JUL-2004	08-JUL-2004	08-JUL-2004
	Matrix:	Water	Water	Water	Water
	Sampled on:	30-JUN-2004	30-JUN-2004	30-JUN-2004	30-JUN-2004
	Lab ID :	14032738	14032739	14032740	14032741
	Client ID:	MW32	MW38	BH10	DUPLICATE
Pb-DMS31	Lead Dissolved	06-JUL-2004	06-JUL-2004	06-JUL-2004	
H104PT11	Hydrocarbons C5-C10	08-JUL-2004	08-JUL-2004	08-JUL-2004	09-JUL-2004
PHC2PHCW	CCME PHC F2 C10-16	08-JUL-2004	08-JUL-2004	08-JUL-2004	
PKG-BT32	BTEX-CCME F1 WATER	08-JUL-2004	08-JUL-2004	09-JUL-2004	09-JUL-2004
	Matrix:	Water	Water	Water	Water
	Sampled on:	30-JUN-2004	30-JUN-2004	30-JUN-2004	30-JUN-2004
	Lab ID :	14032742	14032743		
	Client ID:	FIELD BLANK	TRIP BLANK		
H104PT11	Hydrocarbons C5-C10	08-JUL-2004	08-JUL-2004		
PKG-BT32	BTEX-CCME F1 WATER	08-JUL-2004	08-JUL-2004		
	Matrix:	Water	Water		
	Sampled on:	30-JUN-2004	5-JUL-2004		





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BATCH NUMBERS Form 08151223

	Lab ID :	14032734	14032735	14032736	14032737
	Client ID:	MW37	MW34	MW33	MW36
Pb-DMS31	Lead Dissolved	44201710	44201710	44201710	44201710
H104PT11	Hydrocarbons C5-C10	45202063	45202063	45202063	45202063
PHC2PHCW	CCME PHC F2 C10-16	45700801	45700801	45700801	45700801
PKG-BT32	BTEX-CCME F1 WATER	45202063	45202063	45202063	45202063
	Matrix:	Water	Water	Water	Water
	Sampled on:	30-JUN-2004	30-JUN-2004	30-JUN-2004	30-JUN-2004
	Lab ID :	14032738	14032739	14032740	14032741
	Client ID:	MW32	MW38	BH10	DUPLICATE
Pb-DMS31	Lead Dissolved	44201710	44201710	44201710	
H104PT11	Hydrocarbons C5-C10	45202063	45202063	45202063	45202084
PHC2PHCW	CCME PHC F2 C10-16	45700801	45700801	45700801	
PKG-BT32	BTEX-CCME F1 WATER	45202063	45202063	45202084	45202084
	Matrix:	Water	Water	Water	Water
	Sampled on:	30-JUN-2004	30-JUN-2004	30-JUN-2004	30-JUN-2004
	Lab ID :	14032742	14032743		
	Client ID:	FIELD BLANK	TRIP BLANK		
H104PT11	Hydrocarbons C5-C10	45202063	45202063		
PKG-BT32	BTEX-CCME F1 WATER	45202063	45202063		
	Matrix:	Water	Water		·
	Sampled on:	30-JUN-2004	5-JUL-2004		



12-Jul-04 Page 11 of 11 BLANK SUMMARY. Form 08151223

All method blanks were less than MDL



ANALYTICAL SERVICES

Sample ID: 32734

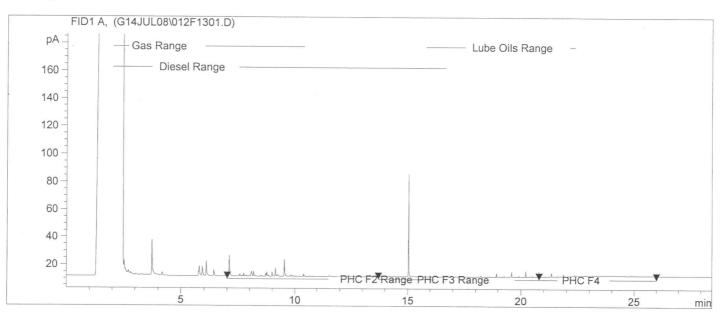
Method File: CCMEWW.M

Date & Time Analyzed: 7/8/2004 11:16:03 PM

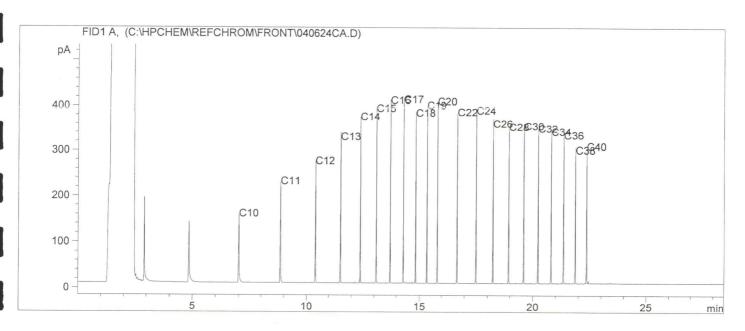
Multiplier: 1

Vial: 12 Sequence line#: 13

Operator: sks



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16

Diesel: C8 - C22 Lubricating Oils: C20 - C40 Crude Oils: C3 - C60+



ANALYTICAL SERVICES

Operator: sks

Vial: 13

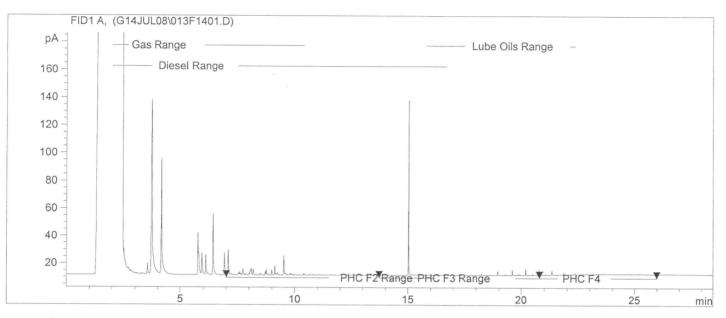
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Sample ID: 32735

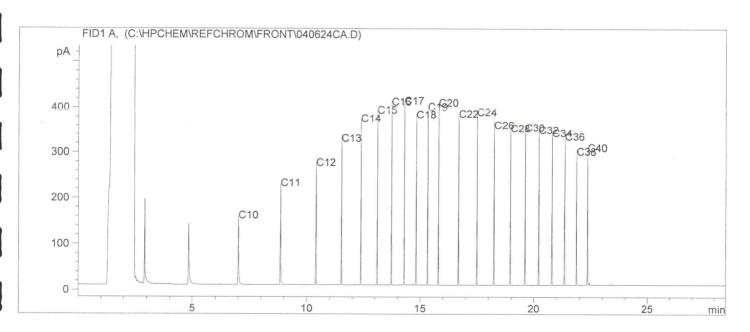
Method File: CCMEWW.M

Date & Time Analyzed: 7/8/2004 11:55:54 PM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

C4 - C12 C8 - C12 C7 - C16 Gasoline: Varsol: Kerosene:

Diesel: C8 - C22 C20 -Lubricating Oils: Crude Oils:

C40



M W 33

ANALYTICAL SERVICES

Sample ID: 32736

Method File: CCMEWW.M

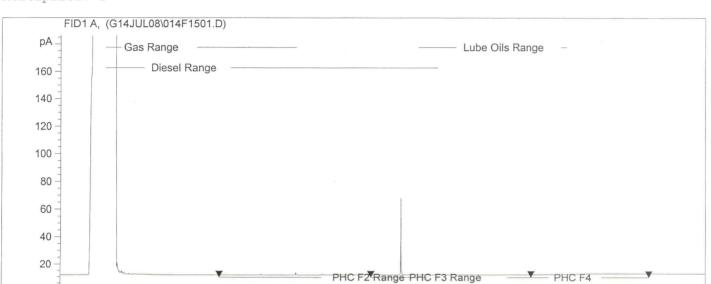
Date & Time Analyzed: 7/9/2004 12:35:29 AM

Multiplier: 1

Operator: sks Vial: 14 Sequence line#: 15

25

min



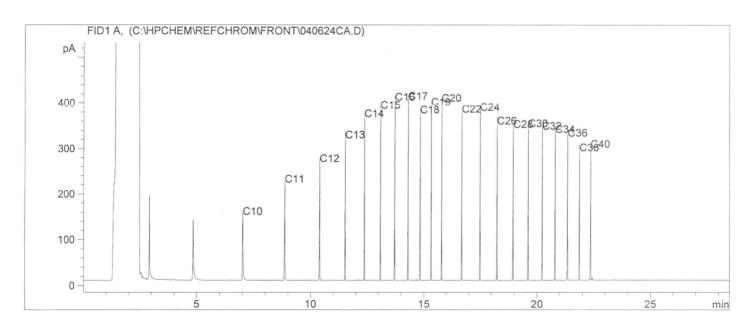
15

20

Carbon Range Reference Chromatogram at approx. 25ppm

5

10



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16 Diesel: C8 - C22 Lubricating Oils: C20 - C40 Crude Oils: C3 - C60+



ANALYTICAL SERVICES

Operator: sks

Vial: 15

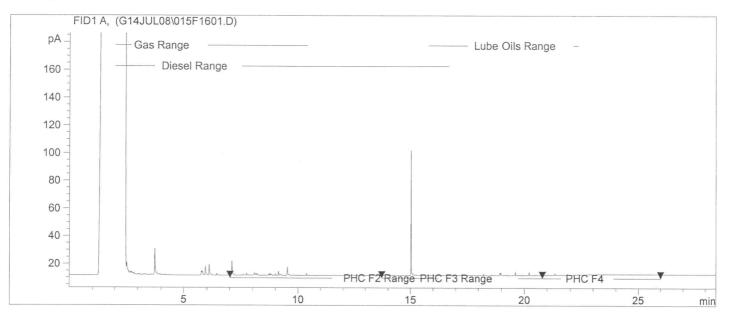
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Sample ID: 32737

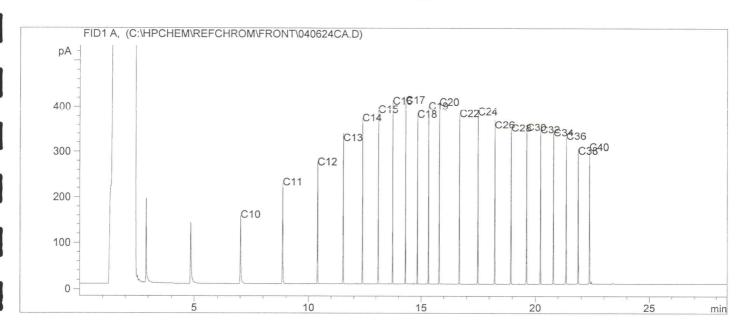
Method File: CCMEWW.M

Date & Time Analyzed: 7/9/2004 1:15:01 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16

Diesel: C8 - C22
Lubricating Oils: C20 - C40
Crude Oils: C3 - C60



ANALYTICAL SERVICES

Sample ID: 32738

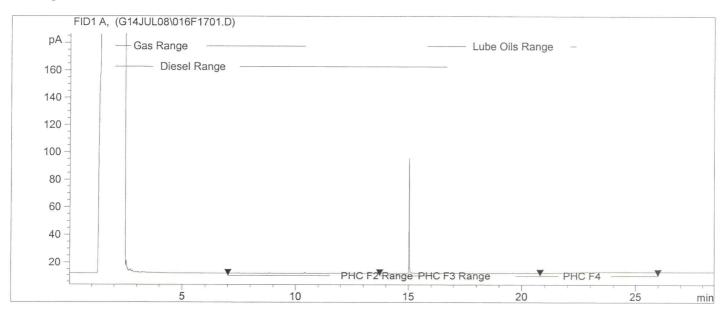
Method File: CCMEWW.M

Date & Time Analyzed: 7/9/2004 1:54:26 AM

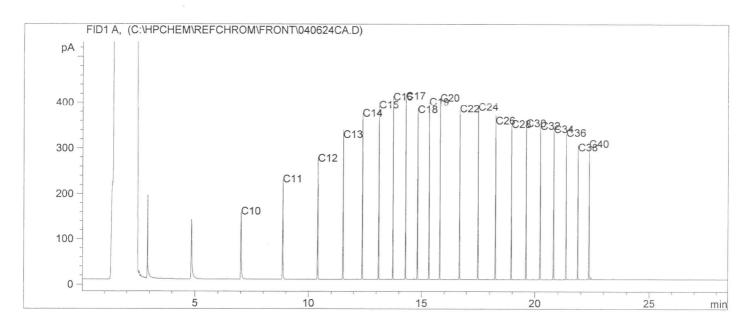
Multiplier: 1

Operator: sks Vial: 16

Sequence line#: 17



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 C12 Varsol: C8 C12 Kerosene: C16 Diesel: C8 - C22 C20 - C40 Lubricating Oils: Crude Oils: C3C60+



ANALYTICAL SERVICES

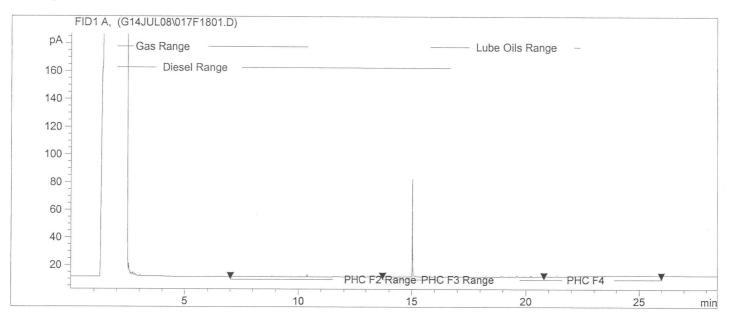
Sample ID: 32739

Method File: CCMEWW.M

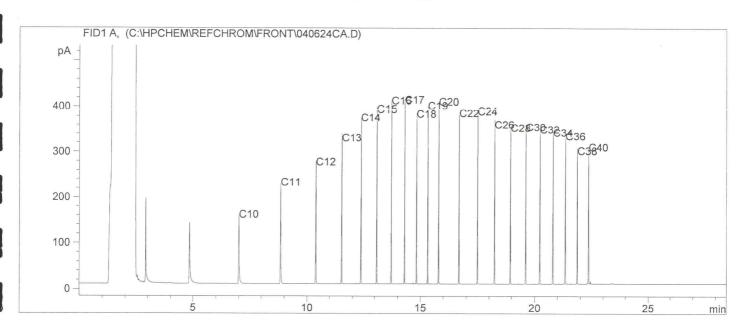
Date & Time Analyzed: 7/9/2004 2:33:47 AM

Multiplier: 1

Operator: sks Vial: 17 Sequence line#: 18



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16

Diesel: C8 - C22 Lubricating Oils: C20 - C40 Crude Oils: C3 - C60+





Operator: sks

Vial: 18

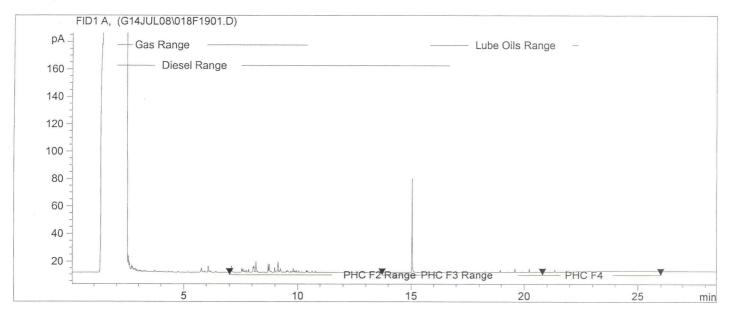
Sequence line#: 19

Sample ID: 32740

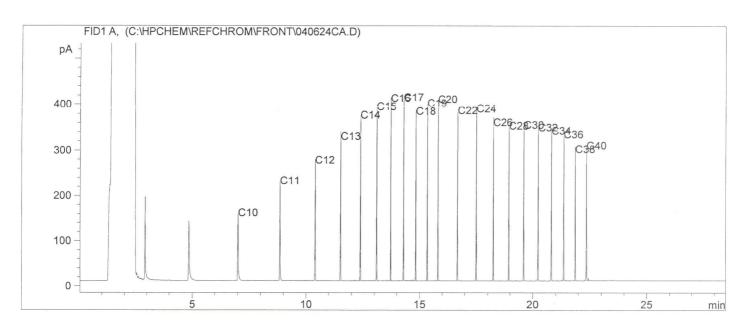
Method File: CCMEWW.M

Date & Time Analyzed: 7/9/2004 3:12:56 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16 Diesel: C8 - C22 Lubricating Oils: C20 - C40 Crude Oils: C3 - C60+



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Certificate of Analysis

8577 Commerce Court Burnaby, B.C. Canada V5A 4N5 Tel 604 444 4808 Fax 604 444 4511

Reported To:

AMEC EARTH & ENVIRONMENTAL

Client Code L9

440 DOVERCOURT DRIVE

Attention

: A. DESGROSEILLIERS

WINNIPEG, MB

Phone

: (204) 488-2997

R3Y 1N4

FAX

: (204) 489-8261

Project Information:

Project ID : WX05876

Submitted By: ANDREA HACHKOWSKI

Requisition Forms:

Form 81514512 shipped on 06-Aug-04 received on 07-Aug-04 logged on 7-Aug-04 completed on 17-Aug-04 Form 81514521 shipped on 06-Aug-04 received on 07-Aug-04 logged on 7-Aug-04 completed on 17-Aug-04

Remarks:

All blank values are reported. Associated data are not blank corrected.

'MDL' = Method Detection Limit, '<' = Less than MDL, '--' = Not analyzed

Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease

Organic analyses are not corrected for extraction recovery standards except for Isotope

Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses) All CCME and/or BC CSR results met required criteria unless otherwise stated in the report. All data on final reports are validated by technical personnel. Signature on file at laboratory. Deviations from Reference Method for the Canadian-wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method:

■ F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction

All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency

All analysis data reported was generated when the analytical methods were in statistical control and IOL criteria for spike recoveries, reference material recoveries, method blank data and duplicate precision were met unless otherwise stated

This report shall not be reproduced except in full, without the written approval of the laboratory

(d. 5)

Methods used by PSC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 20th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Liability for any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at PSC for a period of 30 days from receipt of data or as per contract.

PSC Project Manager: Clifton Samoiloff

GHH results added



PSC

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ANALYTICAL REPORT

Client :

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID : Client ID :

14041307

14041308

04-8 @ 17.5

04-4 @ 7.5-10'

						7.5-10
Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL	Towns and the Amir 1	0.1.	0			
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	19.2	32.1
METALS TO	TAL					
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	7.7	12.1
HYDROCAR	DONG					
H1DKOCAK EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/08/10	04/08/10
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	< 10	< 10
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	< 10	< 10
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
РНС4НСНТ	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes	Yes
VOLATILE (DRGANICS-MAH					
EX995170	Volat. Soil Extract.	date		DTEV SOIL by COME SIM	04/08/07	04/09/07
3020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM BTEX SOIL by GCMS SIM	0.25	04/08/07 0.005
30201 120 3021PT20	Ethylbenzene	ug/g ug/g	0.001	BTEX SOIL by GCMS SIM	0.23	0.003
T001PT20	Toluene	ug/g	0.003	BTEX SOIL by GCMS SIM	< 0.010	< 0.008
X_882_10	Xylenes	ug/g ug/g	0.010	BTEX SOIL by GCMS SIM	< 0.010	< 0.010
K003PT20	m,p - Xylene	ug/g ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10	< 0.10
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10	< 0.10
		-5' 5	0.10	ZIZI OOLO OJ OOLIO OIM	. 0.10	V 0.10
	GATE RECOVERY					
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	92	96
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	96	97
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	100	101
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	99	103

Matrix : Sampled on: Soil 04/08/04 15:20 Soil 04/08/04 10:30



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ANALYTICAL REPORT

CI!

Client: AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID :

14041309

14041310

Client ID:

04-1 @ 15'

04-4 @ 12.5'-15'

Soil Soil 04/08/05 14:40 04/08/04 11:00

						12.5'-15'	
Sparcode	Parameter	Unit	MDL	Workroute			
PHYSICAL							
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1	
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	15.1	31.0	
METALS TO	TAL						
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	4.5		
HYDROCAR	BONS						
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/08/10		
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	< 10		
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	< 10		
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	< 50		
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50		
PHC4HCHT	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50		
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes		
POLYCYCLI	C AROMATIC HYDROCARBON	ĮS					
EX9946Z2	Soil prep for PAH	date		PAH by GC/MS 8270		04/08/11	
PA05OS12	Benzo(a)pyrene	ug/g	0.01	PAH by GC/MS 8270		< 0.01	
PA14OS12	Naphthalene	ug/g	0.01	PAH by GC/MS 8270		< 0.01	
SURROGATE	ERECOVERY						
PeryOS12	d12-Perylene	%	0	PAH by GC/MS 8270		80	
VOLATILE C	DRGANICS-MAH						
EX995170	Volat. Soil Extract.	date		BTEX SOIL by GCMS SIM	04/08/07		
B020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM	0.12		
B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM	0.037		
T001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM	< 0.010		
X_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM	< 0.1		
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10		
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10		
	GATE RECOVERY						
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	96		
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	97		
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	103		

Matrix

Sampled on:



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1460 101 2

Client: AMEC EARTH & ENVIRONMENTAL

Project: WX05876

Lab ID : Client ID : 14041309

14041310

04-1 @ 15'

04-4 @ 12.5'-15'

Sparcode	Parameter	Unit	MDL	Workroute		
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	103	
				Matrix : Sampled on:	Soil 04/08/05 14:40	Soil 04/08/04 11:00



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ANALYTICAL REPORT

Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID : Client ID:

14041311 04-9 @ 5'

14041312 04-5@

10'-12.5'							
		Workroute	MDL	Unit	Parameter	Sparcode	
						PHYSICAL	
1	1	Temperature on arrival	0	Celsius	Temperature Arrival	TEMPARRI	
23.6	22.6	Hom; Gravimetric 105C	0.1	%(W/W)	Moisture	00250760	
					TAL	METALS TO	
10.1	9.8	D&G:HNO3/HCl Dig:ICP-MS	0.1	ug/g	Lead	Pb-TMS20	
					BONS	HYDROCAR	
04/08/10	04/08/10	CCME F2-F4 High Temp		date	PHC EXT F2 - 4	EX995649	
< 10	< 10	CCME F1 by P&T GC/FID	10	ug/g	CCME PHC F1 C6-10	PHC1PT18	
< 10	< 10	Calculated Result		ug/g	CCME PHC F1-BTEX	HC1-CALC	
< 50	< 50	CCME F2-F4 High Temp	50	ug/g	CCME PHC F2 C10-16	PHC2HCHT	
< 50	< 50	CCME F2-F4 High Temp	50	ug/g	CCME PHC F3 C16-34	PHC3HCHT	
< 50	< 50	CCME F2-F4 High Temp	50	ug/g	CCME PHC F4 C34-50+	PHC4HCHT	
Yes	Yes	Hydrocarbons by GC/FID	Yes	Y/N	PHC F2-4 BASELINE 0	BASEPHCS	
					DRGANICS-MAH	VOLATILE O	
04/08/07	04/08/07	BTEX SOIL by GCMS SIM		date	Volat. Soil Extract.	EX995170	
0.008	0.004	BTEX SOIL by GCMS SIM	0.001	ug/g	Benzene	B020PT20	
0.008	0.007	BTEX SOIL by GCMS SIM	0.003	ug/g	Ethylbenzene	B021PT20	
< 0.010	< 0.010	BTEX SOIL by GCMS SIM	0.010	ug/g	Toluene	Г001РТ20	
< 0.1	< 0.1	BTEX SOIL by GCMS SIM	0.1	ug/g	Xylenes	X_882_10	
< 0.10	< 0.10	BTEX SOIL by GCMS SIM	0.10	ug/g	m,p - Xylene	X003PT20	
< 0.10	< 0.10	BTEX SOIL by GCMS SIM	0.10	ug/g	o - Xylene	X002PT20	
					GATE RECOVERY		
97	98	BTEX SOIL by GCMS SIM	0	%	Bromofluorobenzene	VS01PT20	
100	96	BTEX SOIL by GCMS SIM	0	%	d4-1,2-dichloroethane	VS02PT20	
102	98		0				
96	103	BTEX SOIL by GCMS SIM	60	%	Ethylbenzene-d10	Ed10PT20	
Soil	Soil	Matrix :			,		
	04/08/06 14:00						
1	103 Soil	BTEX SOIL by GCMS SIM BTEX SOIL by GCMS SIM Matrix : Sampled on:		% %	d8-Toluene Ethylbenzene-d10	VS03PT20 Ed10PT20	



25-Aug-04

ANALYTICAL REPORT

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Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID : Client ID :

14041313

14041314

04-4 @ 2.5'

04-10 @ 2.5'

		•				2.5
Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL						
TEMPARRI	Temperature Arrival	Celsius	0 .	Temperature on arrival	1	1
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	4.8	17.2
METALS TO	TAL					
As-TMS20	Arsenic	ug/g	0.2	D&G:HNO3/HCl Dig:ICP-MS	< 0.2	
Ba-TMS20	Barium	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	9.9	
Cr-TMS20	Chromium	ug/g	1	D&G:HNO3/HCl Dig:ICP-MS	3	
Cu-TMS20	Copper	ug/g	0.5	D&G:HNO3/HCl Dig:ICP-MS	3.5	
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	2.4	18.3
Zn-TMS20	Zinc	ug/g	1	D&G:HNO3/HCI Dig:ICP-MS	7	
HYDROCAR	BONS					
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp		04/08/10
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID		· < 10
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result		< 10
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp		< 50
PHC3HCHT	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp		480
PHC4HCHT	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp		920
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID		No
GННТОТ	PHC GHH	ug/g	100	SOLID/HEX-ACET/GRAV/CC	ME	1000
GHHS-MIN	PHC GHH SILICAGEL	ug/g	100	DCM-HEX/Silicagel/Grav		500
	DRGANICS-MAH					
EX995170	Volat. Soil Extract.	date		BTEX SOIL by GCMS SIM		04/08/07
B020PT20	Benzene	· ug/g	0.001	BTEX SOIL by GCMS SIM		0.004
B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM		0.006
F001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM		< 0.010
X_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM		< 0.1
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM		< 0.10
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM		< 0.10
	GATE RECOVERY					
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM		97
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM		99
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM		102
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM		110

Matrix : Sampled on: Soil 04/08/04 10:00

Soil

04/08/05 12:15



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ANALYTICAL REPORT

Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID:

14041313

14041314

04-4 @ 2.5'

04-10 @

2.5

'arameter	Unit	MDL	Workroute		
hylene Glycol	ug/g	5	Glycols in Soils	< 5	
lene Glycol	ug/g	5	Glycols in Soils	< 5	
bylene Glycol	ug/g	5	Glycols in Soils	< 5 (1)	
			Matrix : Sampled on:	Soil 04/08/04 10:00	Soil 04/08/05 12:15
t	Parameter thylene Glycol ylene Glycol pylene Glycol	thylene Glycol ug/g ylene Glycol ug/g	thylene Glycol ug/g 5 ylene Glycol ug/g 5 pylene Glycol ug/g 5	thylene Glycol ug/g 5 Glycols in Soils ylene Glycol ug/g 5 Glycols in Soils pylene Glycol ug/g 5 Glycols in Soils Matrix :	thylene Glycol ug/g 5 Glycols in Soils < 5 ylene Glycol ug/g 5 Glycols in Soils < 5 pylene Glycol ug/g 5 Glycols in Soils < 5 Matrix : Soil

Result comments and/or text results:

(1) Sample subcontracted to PSC Edmonton



14041316

04/08/04 15:00

04/08/04 14:45

14041315

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ANALYTICAL REPORT

Lab ID :

Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

				Client ID:	04-8 @ 2.5	04-8 @ 15'
Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL						
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C		35.4
METALS TO	TAL					
As-TMS20	Arsenic	ug/g	0.2	D&G:HNO3/HCl Dig:ICP-MS		
Ba-TMS20	Barium	ug/g	0.1	D&G:HN03/HCl Dig:ICP-MS		
Cr-TMS20	Chromium	ug/g	1	D&G:HNO3/HC1 Dig:ICP-MS		
Cu-TMS20	Copper	ug/g	0.5	D&G:HNO3/HCl Dig:ICP-MS		
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS		12.9
Zn-TMS20	Zinc	ug/g	1	D&G:HNO3/HCl Dig:ICP-MS	10	
HYDROCAR						
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp		04/08/10
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID		80
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result		77
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp		< 50
PHC3HCHT	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp		< 50
HCF2CALC	PHC F2 C10-16 - PAH	ug/g	50	Calculated Result		< 10
PHC4HCHT BASEPHCS	CCME PHC F4 C34-50+ PHC F2-4 BASELINE 0	ug/g Y/N	50 Yes	CCME F2-F4 High Temp Hydrocarbons by GC/FID		< 50 Yes
DOLVOVOLI	C A DOMATIC HWDDOCADDOL	ATC.				
POLTETELI EX9946Z2	C AROMATIC HYDROCARBO! Soil prep for PAH	date		PAH by GC/MS 8270		04/08/11
PA05OS12	Benzo(a)pyrene	ug/g	0.01	PAH by GC/MS 8270 PAH by GC/MS 8270		< 0.01
PA14OS12	Naphthalene	ug/g ug/g	0.01	PAH by GC/MS 8270		0.65
SURROGATI	E RECOVERY					
PeryOS12	d12-Perylene	%	0	PAH by GC/MS 8270		83
VOLATILE O	DRGANICS-MAH					
EX995170	Volat. Soil Extract.	date		BTEX SOIL by GCMS SIM		04/08/07
3020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM		1.3
3021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM		0.34
001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM		0.094
K_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM		1.1
K003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM		1.1
K002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM		< 0.10
				Motrie	Sail	Soil
		•		Matrix :	Soil	3011

Sampled on:



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ANALYTICAL REPORT

Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID :

14041315

14041316

Client ID:

04-8 @ 2.5

04-8 @ 15'

Sparcode	Parameter	Unit	MDL	Workroute		
VOC SURR	OGATE RECOVERY					
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM		98
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM		92
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM		101
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM		83
				Matrix : Sampled on:	Soil 04/08/04 14:45	Soil 04/08/04 15:00



25-Aug-04

ANALYTICAL REPORT

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Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID : Client ID:

14041317 04-7@

14041318

04/08/05 11:30

04/08/04 13:30

04-6@ 22.5'

				Chent ID.	7.5'-10'	22.5'	
Sparcode	Parameter	Unit	MDL	Workroute			
PHYSICAL							
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1	
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	34.3	10.3	
METALS TO	TAL						
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	12.2	3.5	
HYDROCAR							
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/08/10	04/08/10	
PHC1PT18-	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	< 10	< 10	
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	< 10	< 10	
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	< 50	< 50	
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50	< 50	
PHC4HCHT	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50	< 50	
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes	Yes	
VOLATILE (ORGANICS-MAH						
EX995170	Volat. Soil Extract.	date		BTEX SOIL by GCMS SIM	04/08/07	04/08/07	
B020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM	0.006	0.003	
B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM	0.007	0.005	
T001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM	< 0.010	< 0.010	
X_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM	< 0.1	< 0.1	
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10	< 0.10	
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10	< 0.10	
VOC SURRO	GATE RECOVERY						
VS01PT20	Bromofluorobenzene	% .	0	BTEX SOIL by GCMS SIM	98	98	
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	97	101	
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	98	102	
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	115	107	
				Matrix :	Soil	Soil	
				Matrix :	2011	2011	

Sampled on:



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ANALYTICAL REPORT

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Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID : 14041320 14041319 Client ID: 04-3 @ 04-2@ 10'-12.5' 5'-7.5'

Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL						
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	29.7	32.1
METALS TO	TAL					
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	13.2	12.4
HYDROCAR	BONS					
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/08/10	04/08/10
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	< 10	< 10
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	< 10	< 10
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
PHC3HCHT	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
PHC4HCHT	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes	Yes
VOLATILE C	DRGANICS-MAH					
EX995170	Volat. Soil Extract.	date		BTEX SOIL by GCMS SIM	04/08/07	04/08/07
B020PT20	Benzene	ug/g	0.001		0.006	0.006
B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM	0.008	0.009
T001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM	< 0.010	< 0.010
X_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM	< 0.1	< 0.1
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10	< 0.10
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10	< 0.10
VOC SURRO	GATE RECOVERY					
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	99	98
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	95	102
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	98	101
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	113	110
				Matrix :	Soil	Soil
				Sampled on:	04/08/04 14:00	04/08/05 09:45



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ANALYTICAL REPORT

Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID : 14041321 14041322 DUP 3 Client ID: 04-1@ 12.5

Sparcode	Parameter	Unit	MDL	Workroute		
PHYSICAL						
ΓEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	33.2	32.4
METALS TO	TAL					
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	11.8	12.0
HYDROCAR	BONS					
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/08/10	04/08/10
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	71	70
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	65	64
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
PHC4HCHT	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50	< 50
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes	Yes
VOLATILE (DRGANICS-MAH					
EX995170	Volat. Soil Extract.	date		BTEX SOIL by GCMS SIM	04/08/07	04/08/07
B020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM	1.4	1.6
B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM	2.5	2.3
T001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM	0.094	0.024
X_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM	2.3	2.1
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	2.3	2.1
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10	< 0.10
VOC SURRO	GATE RECOVERY					
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	100	105
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	92	91
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	101	104
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	83	115
				Matrin	Coil	Soil
				Matrix :	Soil 04/08/05 14:30	04/08/05 16:0
				Sampled on:	U4/U8/U5 14:30	U4/U8/U5 16:0

Sampled on:



75C

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ANALYTICAL REPORT

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Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID :

14041323

Client ID:

FIELD BLANK

Sparcode	Parameter	Unit	MDL	Workroute	
PHYSICAL					
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1
00250760	Moisture	%(W/W)	0.1	Hom; Gravimetric 105C	< 0.1
METALS TOT	AL				
Pb-TMS20	Lead	ug/g	0.1	D&G:HNO3/HCl Dig:ICP-MS	1.8
HYDROCARB	ONS				
EX995649	PHC EXT F2 - 4	date		CCME F2-F4 High Temp	04/08/10
PHC1PT18	CCME PHC F1 C6-10	ug/g	10	CCME F1 by P&T GC/FID	< 10
HC1-CALC	CCME PHC F1-BTEX	ug/g		Calculated Result	< 10
PHC2HCHT	CCME PHC F2 C10-16	ug/g	50	CCME F2-F4 High Temp	< 50
РНС3НСНТ	CCME PHC F3 C16-34	ug/g	50	CCME F2-F4 High Temp	< 50
PHC4HCHT	CCME PHC F4 C34-50+	ug/g	50	CCME F2-F4 High Temp	< 50
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Hydrocarbons by GC/FID	Yes
VOLATILE OF	RGANICS-MAH				
EX995170	Volat. Soil Extract.	date		BTEX SOIL by GCMS SIM	04/08/07
B020PT20	Benzene	ug/g	0.001	BTEX SOIL by GCMS SIM	0.005
B021PT20	Ethylbenzene	ug/g	0.003	BTEX SOIL by GCMS SIM	0.008
T001PT20	Toluene	ug/g	0.010	BTEX SOIL by GCMS SIM	< 0.010
X_882_10	Xylenes	ug/g	0.1	BTEX SOIL by GCMS SIM	< 0.1
X003PT20	m,p - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10
X002PT20	o - Xylene	ug/g	0.10	BTEX SOIL by GCMS SIM	< 0.10
VOC SURROC	GATE RECOVERY				
VS01PT20	Bromofluorobenzene	%	0	BTEX SOIL by GCMS SIM	99
VS02PT20	d4-1,2-dichloroethane	%	0	BTEX SOIL by GCMS SIM	93
VS03PT20	d8-Toluene	%	0	BTEX SOIL by GCMS SIM	96
Ed10PT20	Ethylbenzene-d10	%	60	BTEX SOIL by GCMS SIM	96
				Matrix :	Soil
				Sampled on:	04/08/05 14:45



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DUPLICATE SUMMARY

Parameter	Client ID	Lab ID	Sample Conc.	Duplicate Conc.	MDL	Unit	Relative % Diff.
Moisture	04-8 @ 17.5	14041307	19.2	20.4	0.1	%(W/W)	-6.06
Lead	04-10 @ 2.5'	14041314	18.3	19.0	0.1	ug/g	-3.75
PHC GHH SILICAGEL	04-10 @ 2.5'	14041314	500	670	100	ug/g ug/g	-29.06
PHC GHH	04-10 @ 2.5'	14041314	1000	1400	100	ug/g	-33.33
CCME PHC F2 C10-16	04-6 @ 22.5'	14041318	< 50	< 50	50	ug/g	0.00
CCME PHC F3 C16-34	04-6 @ 22.5'	14041318	< 50	< 50	50	ug/g	0.00
CCME PHC F4 C34-50+	04-6 @ 22.5'	14041318	< 50	< 50	50	ug/g	0.00
Benzene	04-6 @ 22.5'	14041318	0.003	0.003	0.001	ug/g	0.00
Toluene	04-6 @ 22.5'	14041318	< 0.010	< 0.010	0.010	ug/g	0.00
Ethylbenzene	04-6 @ 22.5'	14041318	0.005	0.005	0.003	ug/g	0.00
m,p - Xylene	04-6 @ 22.5'	14041318	< 0.10	< 0.10	0.10	ug/g	0.00
o - Xylene	04-6 @ 22.5'	14041318	< 0.10	< 0.10	0.10	ug/g	0.00
CCME PHC F1 C6-10	04-6 @ 22.5'	14041318	< 10	< 10	10	ug/g	0.00





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SPIKE SUMMARY

Parameter	Client ID	Lab ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
CCME PHC F2 C10-16	Blank Spike. Batch:	45700958	< 50	370	450	ug/g	82
CCME PHC F3 C16-34	Blank Spike, Batch:	45700958	< 50	1100	1450	ug/g	75
CCME PHC F4 C34-50+	Blank Spike. Batch:	45700958	< 50	77	100	ug/g	77
Benzene	Blank Spike. Batch:	45202524	0.003	0.033	.043	ug/g	69
Toluene	Blank Spike. Batch:	45202524	< 0.010	0.031	.043	ug/g	71
Ethylbenzene	Blank Spike. Batch:	45202524	0.007	0.026	.043	ug/g	47
Lead	Blank Spike. Batch:	44202050	< 0.1	52.3	50	ug/g	105
Benzo(a)pyrene	Blank Spike. Batch:	44500830	< 0.01	1.6	1.94	ug/g	83
Naphthalene	Blank Spike. Batch:	44500830	< 0.01	1.6	1.94	ug/g	84
Arsenic	Blank Spike. Batch:	44202050	< 0.2	53.9	50	ug/g	108
Chromium	Blank Spike. Batch:	44202050	< 1	49	50	ug/g	97
Copper	Blank Spike. Batch:	44202050	< 0.5	53.6	50	ug/g	107
Zinc	Blank Spike. Batch:	44202050	< 1	54	50	ug/g	108
Lead	04-10 @ 2.5'	14041314	18.3	68.2	50	ug/g	100
CCME PHC F2 C10-16	04-6 @ 22.5'	14041318	< 50	520	501	ug/g	103
CCME PHC F3 C16-34	04-6 @ 22.5'	14041318	< 50	1500	1620	ug/g	94
CCME PHC F4 C34-50+	04-6 @ 22.5'	14041318	< 50	110	111	ug/g	100
Benzene	FIELD BLANK	14041323	0.005	0.20	.205	ug/g	93
Toluene	FIELD BLANK	14041323	< 0.010	0.19	.205	ug/g	90
Ethylbenzene	FIELD BLANK	14041323	0.008	0.25	.205	ug/g	116
m,p - Xylene	FIELD BLANK	14041323	< 0.10	0.43	.411	ug/g	104
o - Xylene	FIELD BLANK	14041323	< 0.10	0.21	.205	ug/g	101
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ANALYSIS DATES

	Lab ID :	14041307	14041308	14041309	14041310
	Client ID:	04-8 @ 17.5	04-4 @	04-1 @ 15'	04-4 @
			7.5-10'		12.5'-15'
00250760	Moisture	10-AUG-2004	10-AUG-2004	10-AUG-2004	10-AUG-2004
Pb-TMS20	Lead	11-AUG-2004	11-AUG-2004	11-AUG-2004	
CCMEHCHT	CCME F2-F4 HC'S	11-AUG-2004	11-AUG-2004	11-AUG-2004	
PA05OS12	Benzo(a)pyrene				12-AUG-2004
PA14OS12	Naphthalene				12-AUG-2004
PeryOS12	d12-Perylene				12-AUG-2004
PKG-BT35	BTEX SOIL by GCMS SIM	13-AUG-2004	13-AUG-2004	13-AUG-2004	
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-AUG-2004	4-AUG-2004	5-AUG-2004	4-AUG-2004
	Lab ID :	14041311	14041312	14041313	14041314
	Client ID:	04-9 @ 5'	04-5 @	04-4 @ 2.5'	04-10 @
			10'-12.5'		2.5'
00250760	Moisture	10-AUG-2004	10-AUG-2004	10-AUG-2004	10-AUG-2004
As-TMS20	Arsenic			11-AUG-2004	
Ba-TMS20	Barium			11-AUG-2004	
Cr-TMS20	Chromium			11-AUG-2004	
Cu-TMS20	Copper			11-AUG-2004	
Pb-TMS20	Lead	11-AUG-2004	11-AUG-2004	11-AUG-2004	11-AUG-2004
Zn-TMS20	Zinc			11-AUG-2004	
CCMEHCHT	CCME F2-F4 HC'S	11-AUG-2004	11-AUG-2004		11-AUG-2004
GHHTOT	PHC GHH				20-AUG-2004
GHHS-MIN	PHC GHH SILICAGEL				20-AUG-2004
PKG-BT35	BTEX SOIL by GCMS SIM	13-AUG-2004	13-AUG-2004		13-AUG-2004
PKG-GL02	Glycols in Soils			16-AUG-2004	
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	6-AUG-2004	6-AUG-2004	4-AUG-2004	5-AUG-2004



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ANALYSIS DATES

	Lab ID :	14041315	14041316	14041317	14041318
	Client ID:	04-8 @ 2.5	04-8 @ 15'	04-7 @	04-6 @
				7.5'-10'	22.5'
00250760	Moisture		10-AUG-2004	10-AUG-2004	10-AUG-2004
As-TMS20	Arsenic	11-AUG-2004			
Ba-TMS20	Barium	11-AUG-2004			
Cr-TMS20	Chromium	11-AUG-2004	an an an		
Cu-TMS20	Copper	11-AUG-2004			
Pb-TMS20	Lead	11-AUG-2004	11-AUG-2004	11-AUG-2004	11-AUG-2004
Zn-TMS20	Zinc	11-AUG-2004			
CCMEHCHT	CCME F2-F4 HC'S		11-AUG-2004	11-AUG-2004	11-AUG-2004
PA05OS12	Benzo(a)pyrene		12-AUG-2004		
PA14OS12	Naphthalene		12-AUG-2004		
PeryOS12	d12-Perylene		12-AUG-2004		
PKG-BT35	BTEX SOIL by GCMS SIM		13-AUG-2004	13-AUG-2004	13-AUG-2004
	Mar.	0.7	0-11	C-:1	Call
	Matrix:	Soil 4-AUG-2004	Soil 4-AUG-2004	Soil 4-AUG-2004	Soil 5-AUG-2004
	Sampled on:	4-AUG-2004	4-A0G-2004	4-AUG-2004	J-A00-2004
	Lab ID :	14041319	14041320	14041321	14041322
	Client ID:	04-3 @	04-2@	04-1 @	DUP 3
		10'-12.5'	5'-7.5'	12.5'	
00250760	Moisture	10-AUG-2004	10-AUG-2004	10-AUG-2004	10-AUG-2004
Pb-TMS20	Lead	11-AUG-2004	11-AUG-2004	11-AUG-2004	11-AUG-2004
CCMEHCHT	CCME F2-F4 HC'S	11-AUG-2004	11-AUG-2004	11-AUG-2004	11-AUG-2004
PKG-BT35	BTEX SOIL by GCMS SIM	13-AUG-2004	13-AUG-2004	13-AUG-2004	13-AUG-2004
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-AUG-2004	5-AUG-2004	5-AUG-2004	5-AUG-2004
· ·	Lab ID :	14041323			
	Client ID:	FIELD BLANK			
00250760	Weistung	10 AUG 2004			
00250760	Moisture	10-AUG-2004			
Pb-TMS20	Lead	11-AUG-2004			
CCMEHCHT	CCME F2-F4 HC'S	11-AUG-2004			
PKG-BT35	BTEX SOIL by GCMS SIM	13-AUG-2004			
	Matrix:	Soil			
	Sampled on:	3011			



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BATCH NUMBERS

	Lab ID :	14041307	14041308	14041309	14041310
	Client ID:	04-8 @ 17.5	04-4 @	04-1 @ 15'	04-4 @
			7.5-10'		12.5'-15'
00250760	Moisture	44403163	44403168	44403168	44403168
Pb-TMS20	Lead	44202050	44202050	44202050	
ССМЕНСНТ	CCME F2-F4 HC'S	45700958	45700958	45700958	
PA05OS12	Benzo(a)pyrene				44500830
PA14OS12	Naphthalene	w-w-w			44500830
PeryOS12	d12-Perylene			***	44500830
PKG-BT35	BTEX SOIL by GCMS SIM	45202524	45202524	45202524	
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-AUG-2004	4-AUG-2004	5-AUG-2004	4-AUG-2004
	Lab ID :	14041311	14041312	14041313	14041314
	Client ID:	04-9 @ 5'	04-5 @	04-4 @ 2.5'	04-10 @
			10'-12.5'		2.5'
00250760	Moisture	44403168	44403168	44403168	44403168
As-TMS20	Arsenic			44202050	
Ba-TMS20	Barium		-	44202050	
Cr-TMS20	Chromium			44202050	
Cu-TMS20	Copper			44202050	
Pb-TMS20	Lead	44202050	44202050	44202050	44202050
Zn-TMS20	Zinc			44202050	
CCMEHCHT	CCME F2-F4 HC'S	45700958	45700958		45700958
ЗННТОТ	PHC GHH				44403370
GHHS-MIN	PHC GHH SILICAGEL				44403377
PKG-BT35	BTEX SOIL by GCMS SIM	45202524	45202524		45202524
PKG-GL02	Glycols in Soils			45502365	
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	6-AUG-2004	6-AUG-2004	4-AUG-2004	5-AUG-2004





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BATCH NUMBERS

	Lab ID :	14041315	14041316	14041317	14041318
	Client ID:	04-8 @ 2.5	04-8 @ 15'	04-7 @	04-6 @
				7.5'-10'	22.5'
00250760	Moisture		44403168	44403168	44403168
As-TMS20	Arsenic	44202050			
Ba-TMS20	Barium	44202050			
Cr-TMS20	Chromium	44202050			
Cu-TMS20	Copper	44202050			
Pb-TMS20	Lead	44202050	44202050	44202050	44202050
Zn-TMS20	Zinc	44202050			
CCMEHCHT	CCME F2-F4 HC'S		45700958	45700958	45700958
PA05OS12	Benzo(a)pyrene		44500830		
PA14OS12	Naphthalene		44500830		
PeryOS12	d12-Perylene		44500830		
PKG-BT35	BTEX SOIL by GCMS SIM		45202524	45202524	45202524
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-AUG-2004	4-AUG-2004	4-AUG-2004	5-AUG-2004
	Lab ID : Client ID:	14041319 04-3 @ 10'-12.5'	14041320 04-2 @ 5'-7.5'	14041321 04-1 @ 12.5' 44403168	14041322 DUP 3 44403168
00250760	Moisture	44403168	44403168		44202050
Pb-TMS20	Lead	44202050	44202050	44202050 45700958	45700958
CCMEHCHT	CCME F2-F4 HC'S	45700958	45700958 45202524	45202524	45202524
PKG-BT35	BTEX SOIL by GCMS SIM	45202524	45202524	43202324	43202324
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-AUG-2004	5-AUG-2004	5-AUG-2004	5-AUG-2004
	Lab ID :	14041323 FIELD BLANK			
	Client ID:	FIELD BLANK			
00250760	Moisture	44403168			
Pb-TMS20	Lead	44202050			
CCMEHCHT	CCME F2-F4 HC'S	45700958			
	BTEX SOIL by GCMS SIM	45202524			
	BIEA SOIL by OCMS SIM				
PKG-BT35	Matrix:	Soil			



25-Aug-04 Page 20 of 20

BLANK SUMMARY

All method blanks were less than MDL, except the following:

Parameter	Batch	Sparcode	Blank Conc.	MDL	Unit
Benzene	45202524	B020PT20	0.003	0.001	ug/g
Ethylbenzene	45202524	B021PT20	0.007	0.003	ug/g



04-8 @17.5

ANALYTICAL SERVICES

Sample ID: 41307

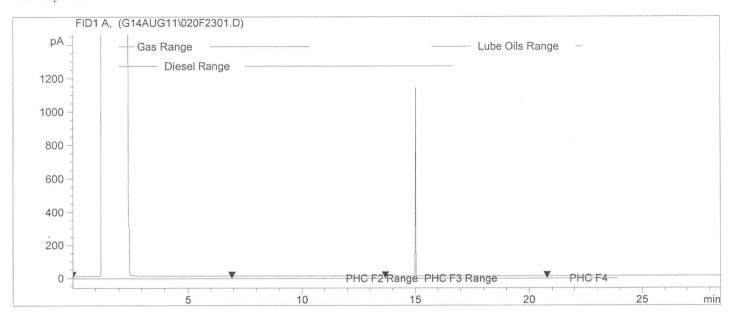
Method File: CCMEWW.M

Date & Time Analyzed: 8/12/2004 4:01:08 AM

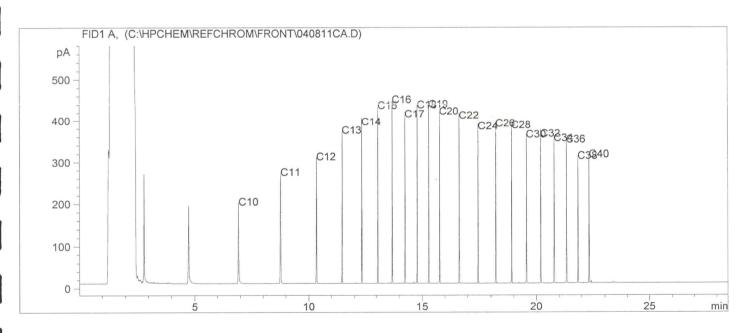
Multiplier: 1

Operator: IT Vial: 20

Sequence line#: 23



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16 Diesel: C8 - C22
Lubricating Oils: C20 - C40
Crude Oils: C3 - C60+



04-4 @ 7.5'-10'

ANALYTICAL SERVICES

Sample ID: 41308

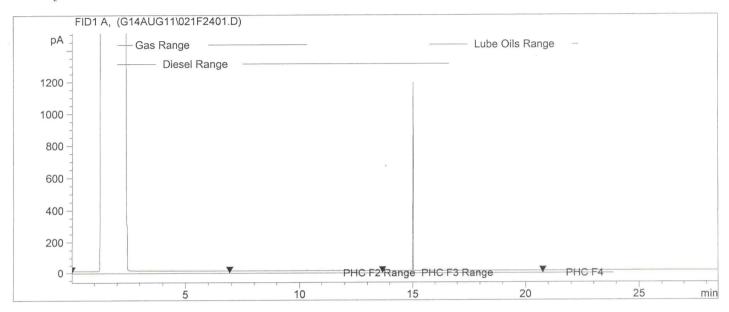
Method File: CCMEWW.M

Date & Time Analyzed: 8/12/2004 4:41:56 AM

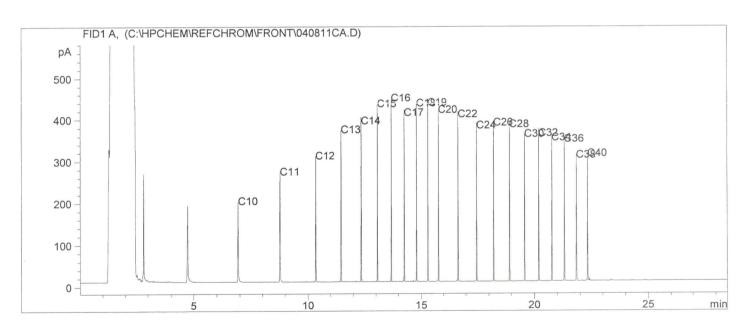
Multiplier: 1

Operator: IT Vial: 21

Sequence line#: 24



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

C8 - C22 Diesel: Gasoline: C12 C4 -C20 -C40 Lubricating Oils: Varsol: C8 C12 C60+ C3 Crude Oils: C7 C16 Kerosene:



04-1@151

ANALYTICAL SERVICES

Operator: IT Vial: 22

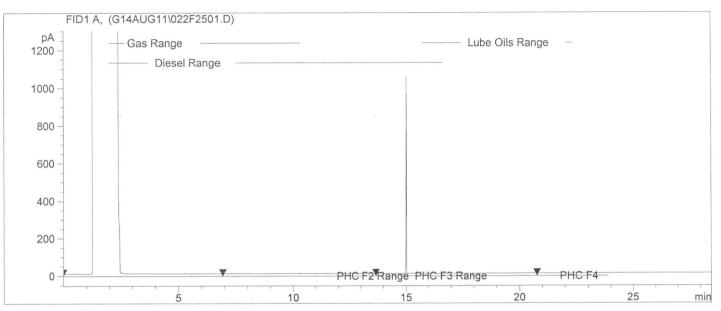
Sequence line#: 25

Sample ID: 41309

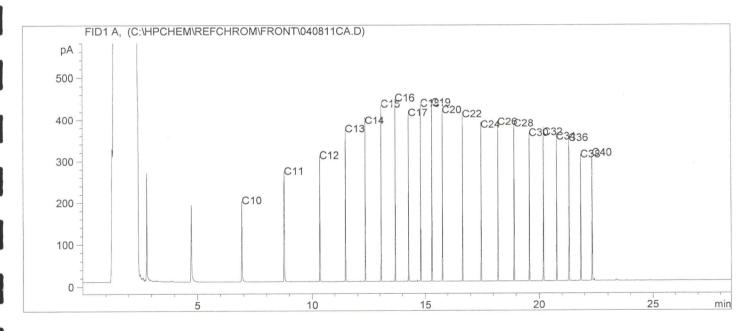
Method File: CCMEWW.M

Date & Time Analyzed: 8/12/2004 5:23:28 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16 Diesel: C8 - C22
Lubricating Oils: C20 - C40
Crude Oils: C3 - C60



04-9051

ANALYTICAL SERVICES

Sample ID: 41311

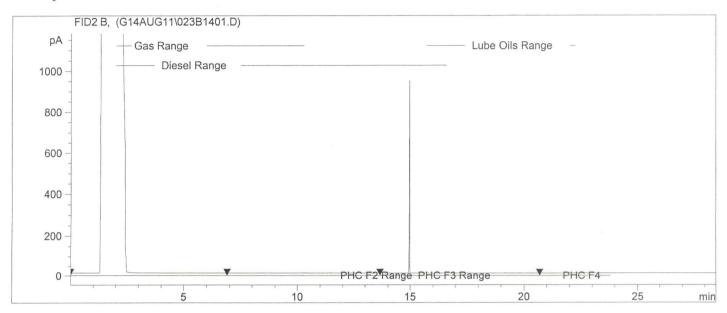
Method File: CCMEWW.M

Date & Time Analyzed: 8/11/2004 9:41:17 PM

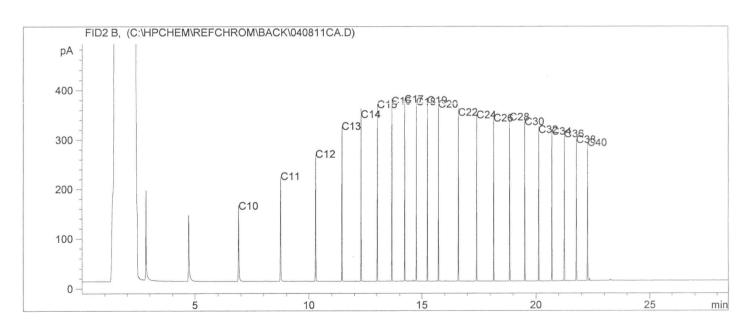
Multiplier: 1

Operator: IT Vial: 23

Sequence line#: 14



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 C12 Varsol: C8 C12 Kerosene: C7 C16

Diesel: C8 - C22 Lubricating Oils: C20 -Crude Oils: C3

C40

C60+



04-5 @101-12.51

ANALYTICAL SERVICES

Sample ID: 41312

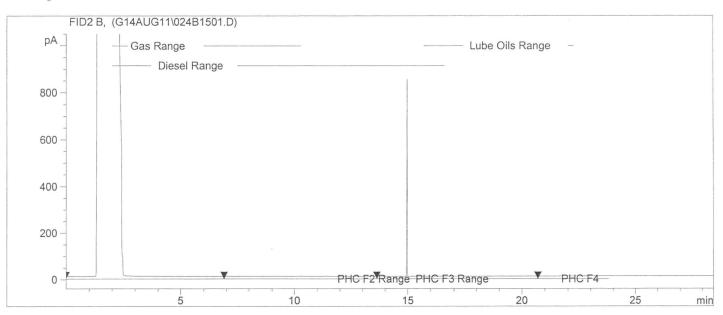
Method File: CCMEWW.M

Date & Time Analyzed: 8/11/2004 10:24:35 PM

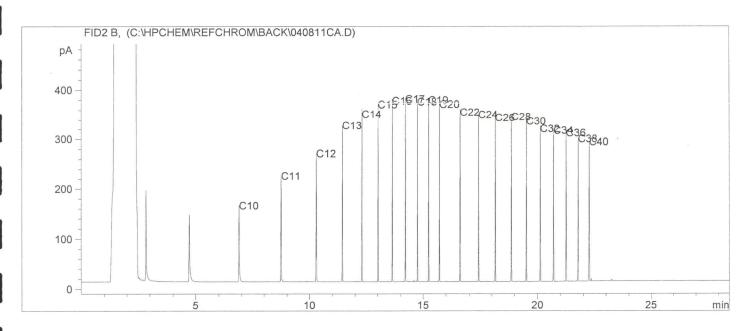
Multiplier: 1

Operator: IT Vial: 24

Sequence line#: 15



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16 Diesel: C8 - C22 Lubricating Oils: C20 - C40 Crude Oils: C3 - C60+



04-10@2.51

ANALYTICAL SERVICES

Sample ID: 41314

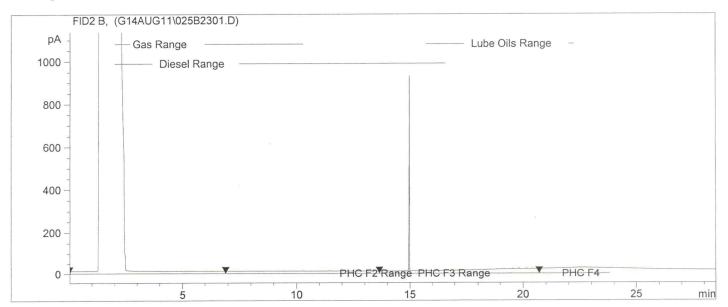
Method File: CCMEWW.M

Date & Time Analyzed: 8/12/2004 4:01:09 AM

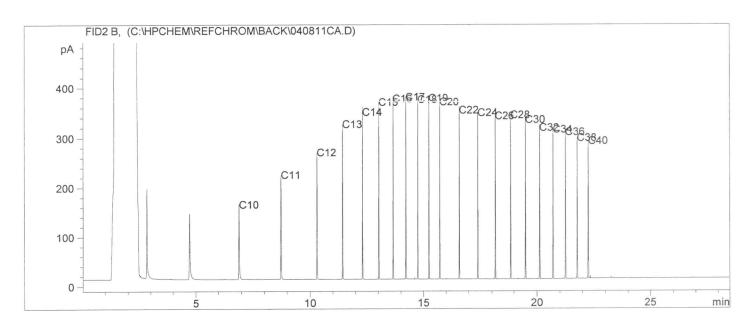
Multiplier: 1

Operator: IT Vial: 25

Sequence line#: 23



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16 Diesel: C8 - C22
Lubricating Oils: C20 - C40
Crude Oils: C3 - C60



04-8@151

ANALYTICAL SERVICES

Sample ID: 41316

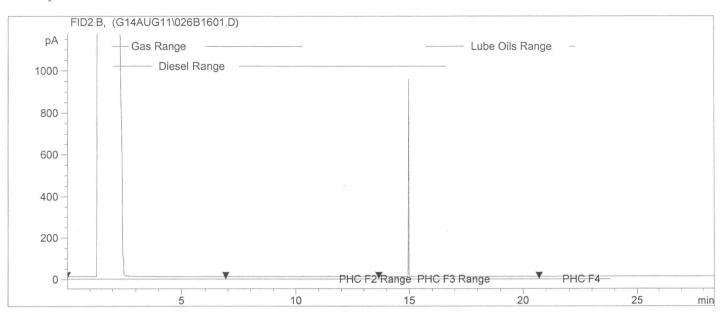
Method File: CCMEWW.M

Date & Time Analyzed: 8/11/2004 11:07:29 PM

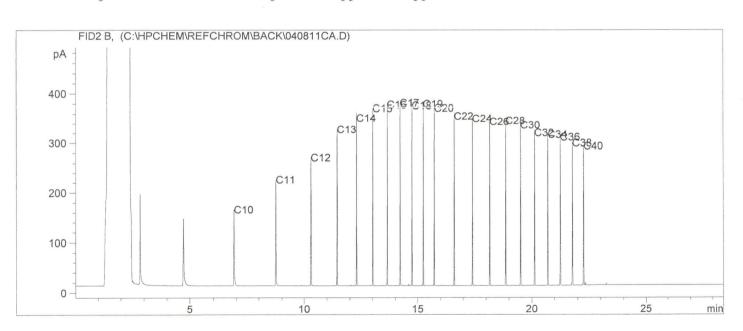
Multiplier: 1

Operator: IT Vial: 26

Sequence line#: 16



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



04-7@7.51-101

ANALYTICAL SERVICES

Sample ID: 41317

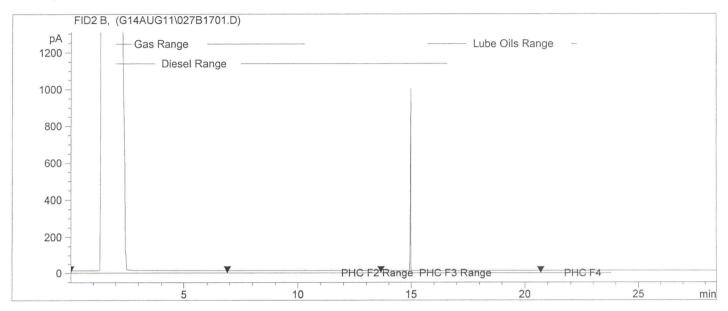
Method File: CCMEWW.M

Date & Time Analyzed: 8/11/2004 11:50:26 PM

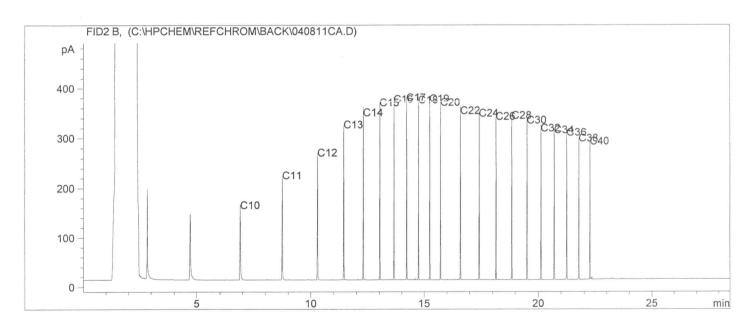
Multiplier: 1

Operator: IT Vial: 27

Sequence line#: 17



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



04-6@22.51

ANALYTICAL SERVICES

Sample ID: 41318

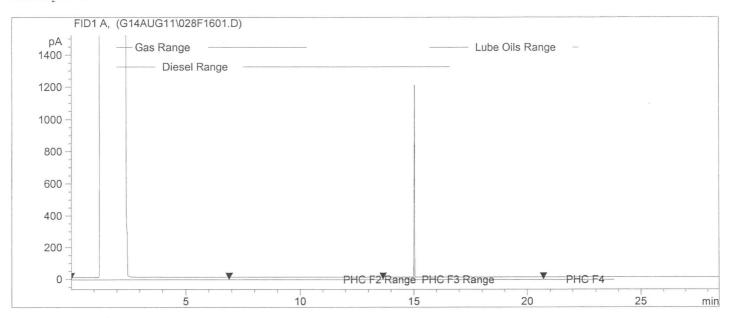
Method File: CCMEWW.M

Date & Time Analyzed: 8/11/2004 11:07:29 PM

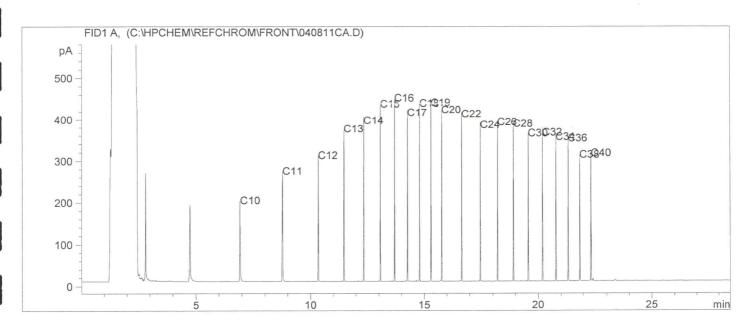
Multiplier: 1

Operator: IT Vial: 28

Sequence line#: 16



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

C12 Gasoline: C4 C12 Varsol: C8 C7 C16 Kerosene:

Diesel: C8 - C22 C20 -C40 Lubricating Oils: C3 Crude Oils: C60+



04-3@101-12.51

ANALYTICAL SERVICES

Operator: IT Vial: 29

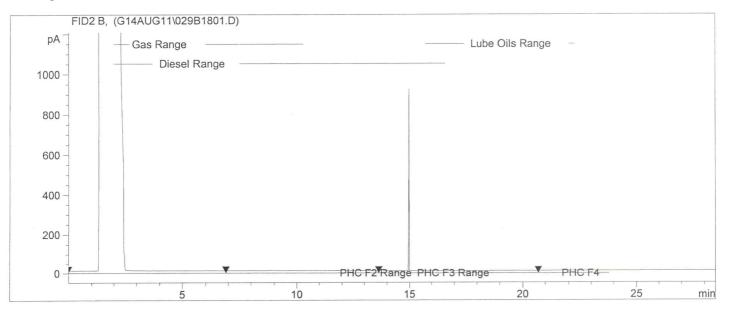
Sequence line#: 18

Sample ID: 41319

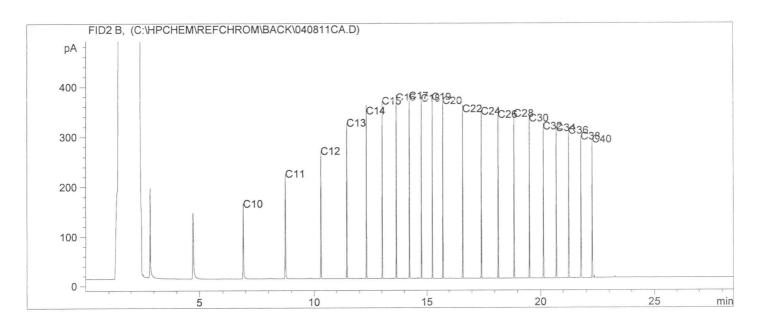
Method File: CCMEWW.M

Date & Time Analyzed: 8/12/2004 12:32:19 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

C8 - C22 Diesel: Gasoline: C4 - C12 Lubricating Oils: C20 -C40 Varsol: C8 - C12 C60+ Crude Oils: C3 Kerosene: C7 - C16



04-2@51-7.51

ANALYTICAL SERVICES

Operator: IT Vial: 30

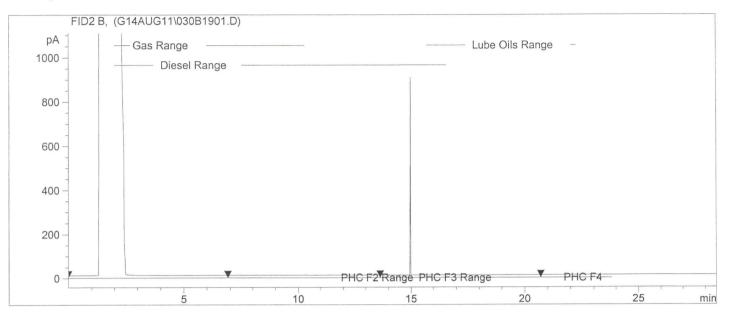
Sequence line#: 19

Sample ID: 41320

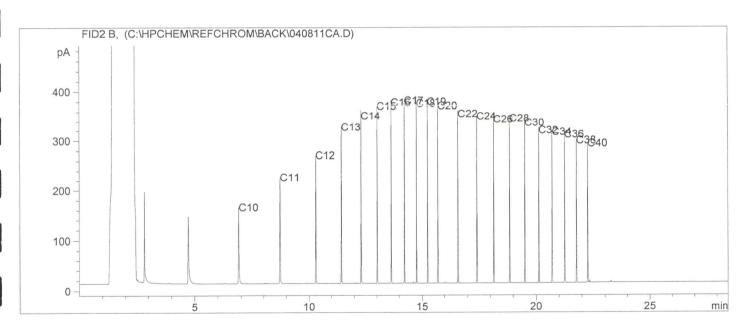
Method File: CCMEWW.M

Date & Time Analyzed: 8/12/2004 1:14:55 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



04-1012.51

ANALYTICAL SERVICES

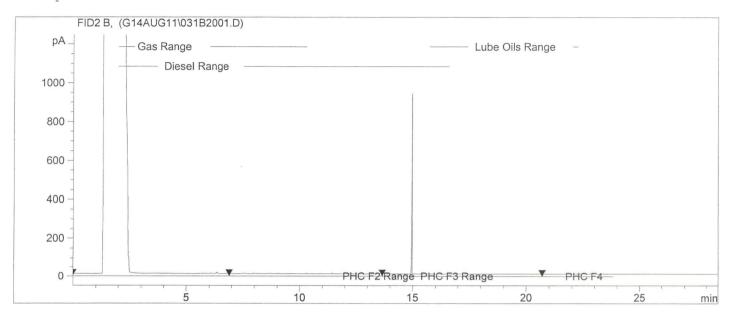
Sample ID: 41321 Method File: CCMEWW.M

Date & Time Analyzed: 8/12/2004 1:56:18 AM

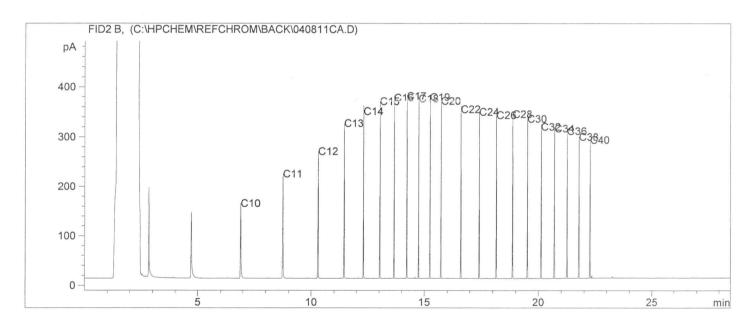
Multiplier: 1

Operator: IT Vial: 31

Sequence line#: 20



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



DUP 3

ANALYTICAL SERVICES

Operator: IT Vial: 32

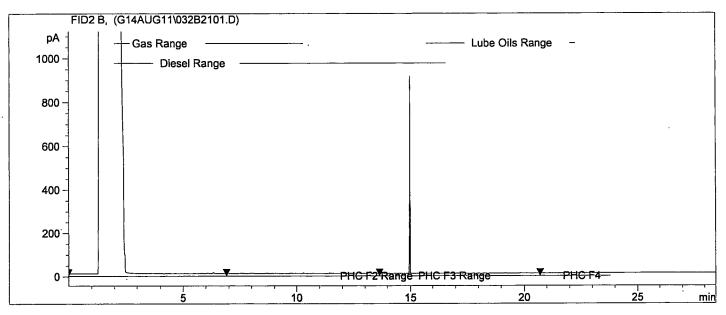
Sequence line#: 21

Sample ID: 41322

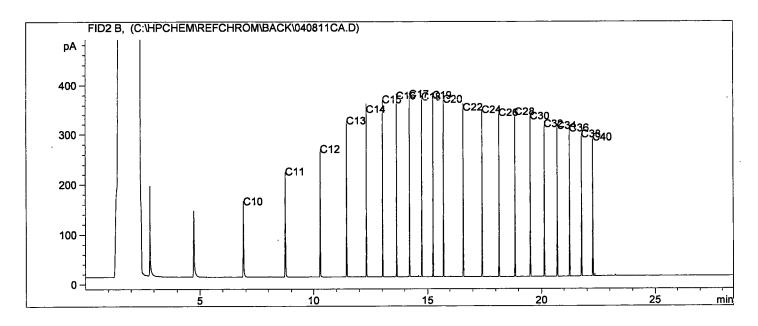
Method File: CCMEWW.M

Date & Time Analyzed: 8/12/2004 2:38:26 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



Field Blank

ANALYTICAL SERVICES

Sample ID: 41323

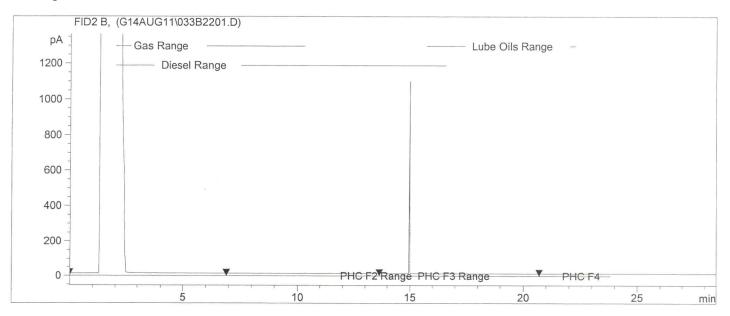
Method File: CCMEWW.M

Date & Time Analyzed: 8/12/2004 3:19:20 AM

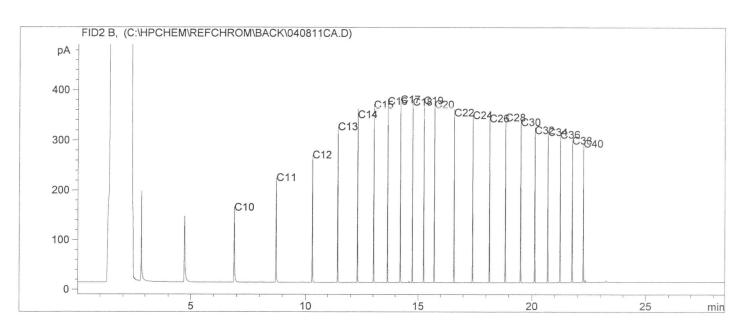
Multiplier: 1

Operator: IT Vial: 33

Sequence line#: 22



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16

SAMPLE INTEGRITY RECORD - The following bottles were received for the below project: PSC ANALYTICAL SERVICES Initial: mF CofC#: 8151451 Date: aug 07104 LUPG Client: AMec Item# NaOH/ZnAc 250ML PLASTIC FILTER/HNO3 H2S04 250ML PLASTIC FILT/H2SO4 Custody Seal not Intact 1. 250ML PLASTIC FILTERED Temp > 10 degrees C 2. 250 ML PLASTIC NaOH 250ML PLASTIC H2SO4 250ML PLASTIC HNOS Broken Bottle in Transit 250 ML AMBER GLASS 100ml AMBER GLASS 3. SOOML AMBER GLASS 40ML AMBER VIALS 250ML CLEAR GLASS CLEAR GLASS 40 ml CLEAR VIALS Microbiology Bottle No C of C 4. 250ML PLASTIC 1L AMBER GLASS PRESERVATIVE 1L CLEAR GLASS C of C information Incomplete 5. 500ML PLASTIC 250ML PLASTIC PLASTIC BAG AIR SAMPLE C of C not signed/dated by consultant 6. 1L PLASTIC Non-current C of C 7. OTHER: Bottles listed on C of C, but not in shipment 8. Bottles in shipment, but not on C of C 9. Analysis Requirements absent/not clear 10. Labelling Issue (missing/and/or incorrect) 11. Samples received >5 days after sampling 12. Samples received after hold time 13. Wrong Bottle(s) used 14. Incorrect Preservation or Headspace present 15. Insufficient # of bottles (no flag by consultant i 16. insufficient sample available in field) Incorrect Task Order # provided to lab 17. 9 10 Anomalies Insufficient Sample (lab use only) 12 o Poured off anions Average Temperature Cooler #1 Comments: Cooler #2 Cooler #3 Cooler #4 Cooler #5 Condition of ice/ice packs:

SAMPLE INTEGRITY RECORD - The following bottles were received for the below project:

Client:	V	Me	C		W	PG							Da	te:_	a	uç	<u> </u>	07	10	7		_]	[ni	tial: MF		Сс	of C	#:	813	5-16	57		
5	250ML CLEAR GLASS	1L AMBER GLASS	1L CLEAR GLASS	1L PLASTIC	500ML AMBER GLASS	250 ML AMBER GLASS	500ML PLASTIC	250ML PLASTIC	250ML PLASTIC FILTERED	250ML PLASTIC HNO3	250ML PLASTIC FILTER/HNO3	250ML PLASTIC H2SO4	250ML PLASTIC FILT/H2SO4	250 ML PLASTIC NaOH	250ML PLASTIC NaOH/ZnAc	Microbiology Bottle	100ml AMBER GLASS H2SO4	40ML AMBER VIALS	40 ml CLEAR VIALS	PLASTIC BAG	AIR SAMPLE	OTHER	7 4 77	PRESERVATIVE CHECK	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.		Termond Termon	mp > 1 oken B o C of C of C in of C no on-curr ottles li ottles in allysis belling mples mples rong B correct sufficie sufficie correct	format ot signe ent C o sted or n shipm Requir g Issue receive receive sottle(s t Presen ent # o ent sam t Task	rees C n Tran tion In ed/dat of C n C of nent, b remen (miss ed >5 ed afte s) used rvation of bottl nple a	C, but not ts absing/ar days a er hold n or H es (no vailab # pro	t not in a t on C o ent/not on ad/or inconfer san frime	shipment f C clear orrect) apling e present consultant d)
Com		ired		1 a1	1101	18																			Cod	oler /	#1		Т 1	empe	eratur)	e /	Averag
		11.5																							Con Con Con	oler i oler i oler i	#2 #3 #4 #5	f ice/i	ice pa	cks:_		T.	

JOB STATUS REPORT

: 08/16/2004 17:33 : PSC ANALYTICAL SERV : 604-444-4511

FAX# : 604-444-4808 TEL# SER.#: 000004012544

DATE, TIME FAX NO./NAME DURATION PAGE(S) RESULT MODE

08/16 17:30 12044898261 00:02:54 25 OK STANDARD ECM



ANALYTICAL SERVICES

16-Aug-04 Page 1 of 21 Interim Report

8577 Commerce Court Burnaby, B.C. Canada V5A 4N5 Tel 604 444 4808 Fax 604 444 4511

Reported To:

AMEC EARTH & ENVIRONMENTAL

Client Code L9

440 DOVERCOURT DRIVE WINNIPEG, MB

Attention Phone

: A. DESGROSEILLIERS

R3Y 1N4

FAX

: (204) 488-2997 (204) 489-8261

Project Information:

Project ID : WX05876

Submitted By: ANDREA HACHKOWSKI

Requisition Forms:

Form 81514512 shipped on 06-Aug-04 received on 07-Aug-04 logged on 7-Aug-04 Form 81514521 shipped on 06-Aug-04 received on 07-Aug-04 logged on 7-Aug-04

Remarks:

All blank values are reported. Associated data are not blank corrected.

'MDL' - Method Detection Limit, '<' = Less than MDL, '--' = Not analyzed Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease +

Organic analyses are not corrected for extraction recovery standards except for Isotope

Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
All CCME and/or BC CSR results met required criteria unless otherwise stated in the report. All data on final reports are validated by technical personnel. Signature on file at laboratory. Deviations from Reference Method for the Canadian-wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method:

■ F1 data - None ■ F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhilet extraction All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior

to follow. Sugget to appac.

	8577 Comme)4) 444-48	808	ES	880	I/P	sc c	CHA.	IN-OI	F-CL	JSTO	DDY	RE	COL	RD A	ND	AN	ALY	SIS	RE	QU	EŞT		Р	AGE		_ OF	2
ANALYTICAL SERVICES	Burnaby, B.C.	. V5A 4		Toll F	Fax: (60 ree: 1-8	00-440-4	511								(a			ANA	LYS	IS F	REC	UES	ST			1	IJ	8	31	51	4	514
COMPANY NAME:	F	PH. #: (2	04)4	E-	-219	7									\top									\top	T	T	1. 1				T	
AMEC			204)													(0)											BE-120(A) Ryes					
COMPANY ADDRESS:	(CLIENT PF	ROJECT ID	: (#)												GCMS						AINOI	<u> </u>				A			ر		
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WPG. MB		MX	(058	5-7	6						PLUS		SBT			PHENOLS			DISSOLVED			AM	NED ((TCLP)	(TCLP)	3	a	3.	3		
SAMPLER NAME (PRINT):								1 de 1	CS)		4-P	2-4)	PLUS			PHE			DISS								130	1	-	. 1		
ANDREA HAEHR	cowski		MANAGEF				}) IEA	OHGANICS)		SNS	IONS	ON 1							LEVEL	LEVEL	H E		WAD	A	 A	M	J	टिएप्	E		
199 Horotto		A.D	ESGE	2051	HUIE	es.		111	E OH		CTIC	ACT	(FRACTION			٩	GREASE	EASE	TOTAL	۳	ALS	NITRITE	בן לב		A	X	Lil.	9	1	PROPYIENE		
			MATRIX	- 6	S S	AMPLING			ATILE	ᇤ	(FRA	S (FR	(FR		_	Y 4AAP	& GR	& GR	5	TALS	MET		DENIL		I FA	BTE	THE	5	The state of the s	000		
FIELD SAMPLE ID	PSC LAB # (Lab Use On	uly) dround	WATER SURFACE WATER SOIL	OTHER	# CONTAINERS # CONTAINERS # DATE	TIME	HEADSPACE VAPOUR	BIEA/ LH	VOC's (VOL	TEH	CCME-PHC (FRACTIONS	CCME-PHCS	CCME BTEX	LEAD	PCB's	PHENOLS BY	TOTAL OIL	MINERAL OIL & GREASE	MERCURY	TOTALS METALS	DISSOLVED METALS	NITRATE	TOTAL SLISBENDED SOLIDS	CVANIDE SAD	LEACHABLE LEAD (AA)	LEACHABLE BTEX (AA)	NAPIS	AS, Ba, Cr	ETHY	1,2 8		
04-8017.5	4130-	7	X		10400/	370	50				X			X																		
204-4 C75-10'	4130	8	X		04/00/0	ILL DIT	MA				X		1	X																		
°04-1 @ 15'	4130	9	X	i	5/06/	4 2:40	40 rom				X)	(4			
4 04-4 E125-15		0	X	·	1 00/100/	of 11:00 4	o									_											X					
504-9@51	4131	Muraber school des	X	1		13 18	41.4.4				×		<u> </u>	X																8		
Oy-50101-12.5	4131	2	X		106/00/0	00:11.0	40				×		>	<															6			
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04-10 @ 2.5°	4131	14	X	1	05/0%/	12:15	rym				X)	X																		
°04-802.5	4131	15	Χ		04/05/0	4 2:45	pm																					X				
104-8 e 151	4131	16	X	1	01/00/01	13:00	mm				X		7	X												,	X					
64-707.5-10	413	17	X	1	و المال	V 1: 20 0	4400				X	-	×																			
1204-60 22.5'	413	18	X		100/00/04	11:30 .	ppm				X			X																		7.
TAT (Turnaround Time)	ESSO SITE LO	CATION:	8602	65/	SP	ECIAL DET	ECTION	LIN	IITS	/ COI	MATV	INAN	TTYPE	E	P	C			and a second	N D D IV	I TEA	MPERA	TUDE	· C I	0.000	PART OF SAME	SE OI	VLY	Tio	0.11.1	21150	7
<5 DAY TAT MUST HAVE PRIOR APPROVAL	Selkirt		880	019	+3											CS AI		A TIE		1	1	,)	TUNE		JUE	DATE			LO	G IN (HEC	-0/
* some exceptions apply please contact lab	PSC SAP:	1	77.		١] 0.	THER			{	(! '			a	19				/	1	A.
STANDARD 10 BUSINESS DAYS		151	1 +		SP	ECIAL REP	ORTING	i OF	RBIL	LING	INST	RUC	TIONS		#	JAH	RS US	SED			10	(ii	016	14			$/\sqrt{\chi}$	17	
STANDARD 5 BUSINESS DAYS	ESSO CONTAC	1 /		ic		36	100	0-1								G	26	2			1				14	210	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	•	16	A	1	
RUSH 2 BUSINESS DAYS ☐ URGENT 1 BUSINESS DAY ☐	RELINQUISH		odget	17	1	3 111	tou	DAT					, TIN	/F					ECEI	VED	BV.						M					
OTHER BUSINESS DAYS	1	Lores	Hail	tor	1			DD/N	/M/Y	Y 06	108	3/00	1		pn	~						t	ni	rolo	to	V						
CUSTODY	RELINQUISH								/M/Y	-	7.51		TIN					-	ECE							,						
RECORD	RELINQUISHE	ED BY:						DAT DD/N	/M/Y	Y ()-	7/0	do	TIN	ИE	111	O		R	ECE	VED	BY L	.ABO	RAT	ORY:		m	F					
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TAT (Turnaround Time)	ESSO SITE I	24. N	113			SP	ECIAL DE	TECH	JN LIN	1115	/ CON	IAIVI	INAN	1 1 1	PE			CCN			ARF	RIVALT	EMPE	RATU	RE °C	- CONTRACTOR	JE D	Miles and the	E ONL	20120011 124	LOG	IN CH	ECK		9
<5 DAY TAT MUST HAVE PRIOR APPROVAL	PSC SAP:	e5/8	8001	74	3													ALE	BERTA	TIER 1		9	1.	7			1	,, (1			_	D		
* some exceptions apply please contact lab						SP	ECIAL RE	PORTI	NG OF	R BII	LING	INST	BUC	TION	S		-	OTH IARS	USE	D	_	11	11	0			O		2			4	1		
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GENT 1 BUSINESS DAY □	RELINQUIS	HED BY	SAMPLE	RY L	_/	1		-	TDAT	F	v A1	. 1 :-	(31h	u T	IME	91	210			REC	CEIVE	ED B	i †), , ,	210	to	1/								
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CUSTODY	RELINQUIS	SHED BY:							DA	MM/Y		10	8/0	J 7	IME		11	\bigcap		REG	CEIVE	ED B	/ LAE	BORA	ATOF	RY:	/	my-	7						
RECORD	ODICINAL D	966 V	/ELLOW/	Dec	DINI	K - CLIENT				VIIVI/Y	YO-	(0)	Ol.	-			11	<u></u>																	



PSC Analytical Services Inc. 8577 Commerce Court Burnaby, B.C. Canada V5A 4N5 Tel 604 444 4808 Fax 604 444 4511

INVOICE BC093310

Invoice date 26-AUG-04 Page 1 of 1 **Consultant's Copy**

Forms included : 81514512 81514521

Imperial Oil Ltd

237-4TH Avenue S.W.

P.O. Box 2480, Stn M Calgary, Alberta

T2P 3M9

Client type : I Client code : L9

Sampler

: ANDREA HACHKOWSKI

Client project ID: WX05876 IOL Contract No : 20493

IOL Commitment No : 11045177

Client account # : 6517

Attention of Andrew Hodgetts

No.	Description of work	Factor Basis for factor	. Quan tity	Referenc SAP Code #
		-		
1	Glycols in Soils		1	FPKG-GL02 SO
2	Moisture		16	S00250760 SO
3	Metals ICP-MS Water Dissolved	1.000	2	
4	Lead		14	SPb-TMS20 SO
5	CCME F2-F4 HC'S		14	FCCMEHCHT SO
6	ETEX SOIL by GCMS SIM		14	FPKG-BT35 SO
7	PHC GHH		1	SGHHTOT SO
. 8	PHC GHH SILICAGEL		1	SGHHS-MIN SO
9				

Date Received : 07-AUG-2004 Date Reported : 16-AUG-2004

Consultant : AMEC EARTH & ENVIRONMENTAL

Consultant Contact : A. DESGROSEILLIERS

Consultant Project No.: WX05876

Site Location: 287 MAIN ST. 860265/SELKIRK, MB 88001943

Net 30 days after date of invoice 2% per month interest charged on all overdue accounts.

Please remit payment to:

PSC Analytical Services Inc.

5555 North Service Road, Burlington, ON, L7L 5H7



IMPERIAL OIL LIMITED / EXXONMOBIL CANADA PSC ANALYTICAL SERVICES CONTRACT

PSC Burnaby

604-444-4511

Data Quality Waiver Request

145

If this waiver is not returned, or the undersigned PSC Analytical representative not contacted within 14 days of Issuance, the laboratory will deem the associated data as acceptable to the recipient, as reported by the laboratory. Please note: If no response has been received within 14 days of issuance, this Data Quality Walver will be considered incomplete by the laboratory and reported as such to Imperial Oll/ExxonMobil Canada in quarterly stewardship reports.

E	Latin & Enviro	nmental	Form #:	81514521 et al
Project: WX05	876		# of Samples:	17
Consultant:	AMEC Earth	& Environmental	IOL PM:	Andrew Hodgetts
Consultant PM:	Allyson Desgr	oseilliers		
		((), (), (), (), (), (), (), (), (), (),	onnocentral programment near parte de met de la company de la company de la company de la company de la company 	T 24. 1622 ISBN 1899 ISBN 1885 1885 1885 1885 1885 1885 1885 188
IOL Site Location		88001943		
Customer Sample	s Affected:	See COC 81514521	and 81514512	
Date of Deviation:	8/13/2004	Test Affected:	BTEX	naaraan kolumoinen ar oo ka sea ku ka ah
DQW Type: 4 - Lal	on: Ethylben	Effect on Data: Minim	eceptance limits ed (RPD 47%). Reason al. Bias low analytical i	
	TOTAL PROPERTY OF THE PARTY OF	The property of the section of the s		
Waiver Issued By: Clifton Samoiloff		Comments:	endonnominoralista en entre en	



09-Sep-04 Page 1 of 13

Certificate of Analysis

8577 Commerce Court Burnaby, B.C. Canada V5A 4N5 Tel 604 444 4808 Fax 604 444 4511

Reported To:

AMEC EARTH & ENVIRONMENTAL

Client Code L9

440 DOVERCOURT DRIVE

Attention

: A.DESGROSEILLIERS

WINNIPEG, MB

Phone

: (204) 488-2997

R3Y 1N4

FAX

: (204) 489-8261

Project Information:

Project ID : WX05876

Submitted By: M.MCGREGOR

Requisition Forms:

Form 08111246 shipped on 31-Aug-04 received on 01-Sep-04 logged on 2-Sep-04 completed on 09-Sep-04 Form 08111247 shipped on 31-Aug-04 received on 01-Sep-04 logged on 2-Sep-04 completed on 09-Sep-04

Remarks:

- All blank values are reported. Associated data are not blank corrected.
- 'MDL' = Method Detection Limit, '<' = Less than MDL, '---' = Not analyzed
- Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- Organic analyses are not corrected for extraction recovery standards except for Isotope
- Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses) All CCME and/or BC CSR results met required criteria unless otherwise stated in the report. All data on final reports are validated by technical personnel. Signature on file at laboratory. Deviations from Reference Method for the Canadian-wide Standard for Petroleum Hydrocarbons
 - in Soil Tier 1 Method: ■ F1 data - None
 - F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction
- All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency
- All analysis data reported was generated when the analytical methods were in statistical control and IOL criteria for spike recoveries, reference material recoveries, method blank data and duplicate precision were met unless otherwise stated
- This report shall not be reproduced except in full, without the written approval of the laboratory

Methods used by Philip are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 20th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Liability for any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at Philip for a period of 30 days from receipt of data or as per contract.

PHILIP Project Manager: Clifton Samoiloff



Water

Water

04/08/30 15:25 04/08/30 15:10 04/08/30 15:00

Water

09-Sep-04

ANALYTICAL REPORT

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Client :

AMEC EARTH & ENVIRONMENTAL

Project :	WX05876			Lab ID : Client ID :	14046292 04-1	14046293 04-2	14046294 04-3
Sparcode	Parameter	Unit	MDL	Workroute			
PHYSICAL							_
ΓEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1	1
METALS DI	SSOLVED						- 0 0005
Pb-DMS31	Lead Dissolved	mg/L	0.0005	Dissolved Waters:ICP/MS	0.0033	< 0.0005	< 0.0005
HYDROCAL	RBONS					0.4400400	0.4.00.100
EX995641	TEH Extraction-Water	date		Hydrocarbons by GC/FID	04/09/09	04/09/09	04/09/09 < 0.1
PHC1PT17	CCME PHC F1 C6-10	mg/L	0.1	CCME F1 by P&T GC/FID		< 0.1	
HC1-CAL1	CCME PHC F1-BTEX	mg/L		Calculated Result	< 0.1	< 0.1	< 0.1
PHC2PHCW	CCME PHC F2 C10-16	mg/L	0.1	Hydrocarbons by GC/FID	0.1	< 0.1	< 0.1
VOLATILE	ORGANICS-MAH				0.4100105	04/00/05	04/09/05
EX995172	Volat. Wat. Pre-Scr.	date		BTEX by GC/MS 8260	04/09/05	04/09/05	
B020PT11	Benzene	ug/L	0.5	BTEX by GC/MS 8260	510	< 0.5	< 0.5
B021PT11	Ethylbenzene	ug/L	0.5	BTEX by GC/MS 8260	29	< 0.5	< 0.5
T001PT11	Toluene	ug/L	0.5	BTEX by GC/MS 8260	< 5.0 (1)	< 0.5	< 0.5 < 0.5
X_8842_5	Xylenes	ug/L	0.5	Calculated Result	36	< 0.5	
X003PT11	m,p - Xylene	ug/L	0.5	BTEX by GC/MS 8260	36	< 0.5	< 0.5 < 0.5
X002PT11	o - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 5.0 (1)	< 0.5	₹ 0.3
VOC SURR	OGATE RECOVERY					101	. 101
VS01PT11	Bromofluorobenzene	%	0	BTEX by GC/MS 8260	102	101	101
VS02PT11	d4-1,2-dichloroethane	%	0	BTEX by GC/MS 8260	116	118	115
VS03PT11	d8-Toluene	%	0	BTEX by GC/MS 8260	98	98	97

Matrix

Sampled on:

Result comments and/or text results:

⁽¹⁾ MDL raised due to sample dilution.



04/08/30 16:10 04/08/30 18:15 04/08/30 15:15

ANALYTICAL SERVICES

09-Sep-04

ANALYTICAL REPORT

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Client :

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Project:	WA038/6			Lab ID : Client ID :	14046295 04-4	14046296 04-5	14046297 04-6
Sparcode	Parameter	Unit	MDL	Workroute			
PHYSICAL TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1	1
METALS DI	CCOLVED						
Pb-DMS31	Lead Dissolved	mg/L	0.0005	Dissolved Waters:ICP/MS	0.0016	< 0.0005	< 0.0005
		-					
HYDROCAF		4-4-		Hadasaahana ba CC/EID	04/09/09	04/09/09	04/09/09
EX995641 PHC1PT17	TEH Extraction-Water CCME PHC F1 C6-10	date mg/L	0.1	Hydrocarbons by GC/FID CCME F1 by P&T GC/FID		< 0.1	< 0.1
HC1-CAL1	CCME PHC F1-BTEX	mg/L	0.1	Calculated Result	< 0.1	< 0.1	< 0.1
	CCME PHC F2 C10-16	mg/L mg/L	0.1	Hydrocarbons by GC/FID	< 0.1	< 0.1	< 0.1
11102111011	COMETHETZ CIO TO	g, 2	0.1	11) 010001100110 0) 00.112			
VOLATILE (ORGANICS-MAH						
EX995172	Volat. Wat. Pre-Scr.	date		BTEX by GC/MS 8260	04/09/05	04/09/05	04/09/05
B020PT11	Benzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	< 0.5
B021PT11	Ethylbenzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	< 0.5
T001PT11	Toluene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	< 0.5
X_8842_5	Xylenes	ug/L	0.5	Calculated Result	< 0.5	< 0.5	0.5
X003PT11	m,p - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	0.5
X002PT11	o - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	< 0.5
VOC SURRO	OGATE RECOVERY						
VS01PT11	Bromofluorobenzene	%	0	BTEX by GC/MS 8260	102	101	100
VS02PT11	d4-1,2-dichloroethane	%	0	BTEX by GC/MS 8260	116	109	112
VS03PT11	d8-Toluene	%	0	BTEX by GC/MS 8260	98	99	98
· · · · ·				Matrix :	Water	Water	Water

Sampled on:



09-Sep-04 Page 4 of 13

ANALYTICAL REPORT

AMEC EARTH & ENVIRONMENTAL Client:

Project:

WX05876

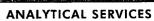
14046298 14046300 14046299 Lab ID : 04-9 04-8 Client ID: 04-7

Sparcode	Parameter	Unit	MDL 	Workroute			
PHYSICAL							
[EMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1	1
METALS D	ISSOLVED						
Pb-DMS31	Lead Dissolved	mg/L	0.0005	Dissolved Waters:ICP/MS	< 0.0005	< 0.0005	< 0.0005
HYDROCA	RBONS						
EX995641	TEH Extraction-Water	date			04/09/09	04/09/09	04/09/09
PHC1PT17	CCME PHC F1 C6-10	mg/L	0.1	CCME F1 by P&T GC/FID		0.2	< 0.1
HC1-CAL1	CCME PHC F1-BTEX	mg/L		Calculated Result	< 0.1	0.1	< 0.1
PHC2PHCW	CCME PHC F2 C10-16	mg/L	0.1	Hydrocarbons by GC/FID	< 0.1	< 0.1	< 0.1
VOLATILE	ORGANICS-MAH						
EX995172	Volat. Wat. Pre-Scr.	date		BTEX by GC/MS 8260	04/09/05	04/09/05	04/09/05
B020PT11	Benzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	59	< 0.5
B021PT11	Ethylbenzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	7.8	< 0.5
T001PT11	Toluene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	< 0.5
X 8842_5	Xylenes	ug/L	0.5	Calculated Result	< 0.5	6.4	< 0.5
X003PT11	m,p - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	6.4	< 0.5
X002PT11	o - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	< 0.5
VOC SURR	OGATE RECOVERY						
VS01PT11	Bromofluorobenzene	%	0	BTEX by GC/MS 8260	100	101	100
VS02PT11	d4-1,2-dichloroethane	%	0	BTEX by GC/MS 8260	112	112	107
VS03PT11	d8-Toluene	%	0	BTEX by GC/MS 8260	96	97	96

Matrix Sampled on:

Water Water 04/08/30 16:00 04/08/30 16:45 04/08/30 16:35

Water



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ANALYTICAL REPORT

Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID : Client ID:

14046301 04-10

14046302 DUPLICATE

14046303 BH9

Workroute Unit MDL Sparcode **Parameter**

		<u> </u>					
PHYSICAL							
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1	1
METALS D	ISSOLVED						
Pb-DMS31	Lead Dissolved	mg/L	0.0005	Dissolved Waters:ICP/MS	0.0010		< 0.0005
HYDROCA	RBONS						0.4.100.100
EX995641	TEH Extraction-Water	date		Hydrocarbons by GC/FID	04/09/09		04/09/09
PHC1PT17	CCME PHC F1 C6-10	mg/L	0.1	CCME F1 by P&T GC/FID		< 0.1	< 0.1
HC1-CAL1	CCME PHC F1-BTEX	mg/L		Calculated Result	< 0.1	< 0.1	< 0.1
PHC2PHCW	CCME PHC F2 C10-16	mg/L	0.1	Hydrocarbons by GC/FID	< 0.1		< 0.1
VOLATILE	ORGANICS-MAH						
EX995172	Volat. Wat. Pre-Scr.	date		BTEX by GC/MS 8260	04/09/05	04/09/05	04/09/05
B020PT11	Benzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	< 0.5
B021PT11	Ethylbenzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	< 0.5
T001PT11	Toluene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	< 0.5
X 8842_5	Xylenes	ug/L	0.5	Calculated Result	< 0.5	< 0.5	< 0.5
X003PT11	m,p - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	< 0.5
X002PT11	o - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5	< 0.5	< 0.5
VOC SURR	OGATE RECOVERY						
VS01PT11	Bromofluorobenzene	%	0	BTEX by GC/MS 8260	97	99	98
VS02PT11	d4-1,2-dichloroethane	%	0	BTEX by GC/MS 8260	113	112	115
VS03PT11	d8-Toluene	%	0	BTEX by GC/MS 8260	98	99	98

Matrix Sampled on: Water

Water

Water 04/08/30 15:30 04/08/30 15:10 04/08/30 17:10



09-Sep-04

ANALYTICAL REPORT

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Client:

AMEC EARTH & ENVIRONMENTAL

Project :	WX05876			Lab ID : Client ID :	14046307 BH10	14046308 BH11	14046309 TRIP BLANK
Sparcode	Parameter	Unit	MDL	Workroute		•	
PHYSICAL							
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1	1	1
METALS DI	SSOLVED						
Pb-DMS31	Lead Dissolved	mg/L	0.0005	Dissolved Waters:ICP/MS	< 0.0005	0.0011	
HYDROCAF							
EX995641	TEH Extraction-Water	date		Hydrocarbons by GC/FID	04/09/09	04/09/09	
PHC1PT17	CCME PHC F1 C6-10	mg/L	0.1	CCME F1 by P&T GC/FID		< 0.1	< 0.1
HC1-CAL1	CCME PHC F1-BTEX	mg/L		Calculated Result	1.3	< 0.1	< 0.1
PHC2PHCW	CCME PHC F2 C10-16	mg/L	0.1	Hydrocarbons by GC/FID	0.6	< 0.1	
VOLATILE	ORGANICS-MAH						
EX995172	Volat. Wat. Pre-Scr.	date		BTEX by GC/MS 8260	04/09/05	04/09/05	04/09/05
B020PT11	Benzene	ug/L	0.5	BTEX by GC/MS 8260	370	8.6	< 0.5
B021PT11	Ethylbenzene	ug/L	0.5	BTEX by GC/MS 8260	82	< 0.5	< 0.5
T001PT11	Toluene	ug/L	0.5	BTEX by GC/MS 8260	8.4	< 0.5	< 0.5
X_8842_5	Xylenes	ug/L	0.5	Calculated Result	46	< 0.5	< 0.5
X003PT11	m,p - Xylene	ug/L	0.5	BTEX by GC/MS 8260	40	< 0.5	< 0.5
X002PT11	o - Xylene	ug/L	0.5	BTEX by GC/MS 8260	5.8	< 0.5	< 0.5
VOC SURRO	OGATE RECOVERY						
VS01PT11	Bromofluorobenzene	%	0	BTEX by GC/MS 8260	101	99	94
VS02PT11	d4-1,2-dichloroethane	%	0	BTEX by GC/MS 8260	111	112	115
VS03PT11	d8-Toluene	% .	0	BTEX by GC/MS 8260	98	98	97
				Matrix :	Water	Water	Water
				Sampled on:	04/08/30 17:50	04/08/30 17:30	04/09/02 14:45



09-Sep-04

ANALYTICAL REPORT

Page 7 of 13

Client:

AMEC EARTH & ENVIRONMENTAL

Project:

WX05876

Lab ID :

14046310

Client ID:

FIELD BLANK

Sparcode	Parameter	Unit	MDL	Workroute	
PHYSICAL					
TEMPARRI	Temperature Arrival	Celsius	0	Temperature on arrival	1
HYDROCARI	BONS				
PHC1PT17	CCME PHC F1 C6-10	mg/L	. 0.1	CCME F1 by P&T GC/FID	< 0.1
HC1-CAL1	CCME PHC F1-BTEX	mg/L		Calculated Result	< 0.1
VOLATILE O	RGANICS-MAH				•
EX995172	Volat. Wat. Pre-Scr.	date		BTEX by GC/MS 8260	04/09/05
B020PT11	Benzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5
B021PT11	Ethylbenzene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5
T001PT11	Toluene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5
X_8842_5	Xylenes	ug/L	0.5	Calculated Result	< 0.5
X003PT11	m,p - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5
X002PT11	o - Xylene	ug/L	0.5	BTEX by GC/MS 8260	< 0.5
VOC SURRO	GATE RECOVERY				
VS01PT11	Bromofluorobenzene	%	0	BTEX by GC/MS 8260	99
VS02PT11	d4-1,2-dichloroethane	%	0	BTEX by GC/MS 8260	111
VS03PT11	d8-Toluene	%	0	BTEX by GC/MS 8260	98
				Matrix :	Water
				Sampled on:	04/08/30 10:30



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DUPLICATE SUMMARY

Parameter	Client ID	Lab ID	Sample Conc.	Duplicate Conc.	MDL	Unit	Relative % Diff.
Benzene	04-5	14046296	< 0.5	< 0.5	0.5	ug/L	0.00
Toluene	04-5	14046296	< 0.5	< 0.5	0.5	ug/L	0.00
Ethylbenzene	04-5	14046296	< 0.5	< 0.5	0.5	ug/L	0.00
m,p - Xylene	04-5	14046296	< 0.5	< 0.5	0.5	ug/L	0.00
o - Xylene	04-5	14046296	< 0.5	< 0.5	0.5	ug/L	0.00
CCME PHC F1 C6-10	04-5	14046296	< 0.1	< 0.1	0.1	mg/L	0.00





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SPIKE SUMMARY

Parameter	Client ID	Lab ID	Sample Conc.	Sample & Spike Conc.	Spike Amoun	Unit t	Percent Recovery
Benzene	Blank Spike. Batch :	45202788	< 0.5	10	10	ug/L	102
Toluene	Blank Spike. Batch:	45202788	< 0.5	9.8	10	ug/L	98
Ethylbenzene	Blank Spike. Batch:	45202788	< 0.5	10	10	ug/L	100
m,p - Xylene	Blank Spike. Batch:	45202788	< 0.5	19	20	ug/L	96
o - Xylene	Blank Spike. Batch:	45202788	< 0.5	10	10	ug/L	100
CCME PHC F2 C10-16	Blank Spike. Batch:	45701064	< 0.1	3.8	4.24	mg/L	90
Lead Dissolved	Blank Spike. Batch:	44202291	< 0.0005	0.0201	.02	mg/L	100
Benzene	04-9	14046300	< 0.5	9.9	10	ug/L	98
Toluene	04-9	14046300	< 0.5	9.4	10	ug/L	94
Ethylbenzene	04-9	14046300	< 0.5	9.6	10	ug/L	96
m,p - Xylene	04-9	14046300	< 0.5	19	20	ug/L	93
o - Xylene	04-9	14046300	< 0.5	9.6	10	ug/L	96



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ANALYSIS DATES

	Lab ID :	14046292	14046293	14046294	14046295
	Client ID:	04-1	04-2	04-3	04-4
					00 000 0001
Pb-DMS31	Lead Dissolved	03-SEP-2004	03-SEP-2004	03-SEP-2004	03-SEP-2004
PHC2PHCW	CCME PHC F2 C10-16	08-SEP-2004	08-SEP-2004	08-SEP-2004	08-SEP-2004
PKG-BT32	BTEX-CCME F1 WATER	05-SEP-2004	05-SEP-2004	05-SEP-2004	05-SEP-2004
	Matrix:	Water	Water	Water	Water
	Sampled on:	30-AUG-2004	30-AUG-2004	30-AUG-2004	30-AUG-2004
	Lab ID :	14046296	14046297	14046298	14046299
	Client ID:	04-5	04-6	04-7	04-8
Pb-DMS31	Lead Dissolved	03-SEP-2004	03-SEP-2004	03-SEP-2004	03-SEP-2004
PHC2PHCW	CCME PHC F2 C10-16	08-SEP-2004	08-SEP-2004	08-SEP-2004	08-SEP-2004
PKG-BT32	BTEX-CCME F1 WATER	05-SEP-2004	05-SEP-2004	05-SEP-2004	05-SEP-2004
	Matrix:	Water	Water	Water	Water
	Sampled on:	30-AUG-2004	30-AUG-2004	30-AUG-2004	30-AUG-2004
	Lab ID :	14046300	14046301	14046302	14046303
	Client ID:	04-9	04-10	DUPLICATE	ВН9
		00.000.0004	on orp and		03-SEP-2004
Pb-DMS31	Lead Dissolved	03-SEP-2004	03-SEP-2004 08-SEP-2004		08-SEP-2004
PHC2PHCW	CCME PHC F2 C10-16	08-SEP-2004	08-SEP-2004 05-SEP-2004	05-SEP-2004	05-SEP-2004
PKG-BT32	BTEX-CCME F1 WATER	05-SEP-2004	U3-SEP-2UU4	U3-3EF-2UU4	03-3EF-2004
	Matrix:	Water	Water	Water	Water
	Sampled on:	30-AUG-2004	30-AUG-2004	30-AUG-2004	30-AUG-2004



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ANALYSIS DATES

	Lab ID :	14046307	14046308	14046309	14046310	
	Client ID:	BH10	BH11	TRIP BLANK	FIELD BLANK	
Pb-DMS31 PHC2PHCW PKG-BT32	Lead Dissolved CCME PHC F2 C10-16 BTEX-CCME F1 WATER	03-SEP-2004 08-SEP-2004 05-SEP-2004	03-SEP-2004 08-SEP-2004 05-SEP-2004	 05-SEP-2004	05-SEP-2004	
	Matrix:	Water	Water	Water	Water	
	Sampled on:	30-AUG-2004	30-AUG-2004	2-SEP-2004	30-AUG-2004	





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BATCH NUMBERS

	Lab ID :	14046292	14046293	14046294	14046295
	Client ID:	04-1	04-2	04-3	04-4
Pb-DMS31	Lead Dissolved	44202291	44202291	44202291	44202291
PHC2PHCW	CCME PHC F2 C10-16	45701064	45701064	45701064	45701064
PKG-BT32	BTEX-CCME F1 WATER	45202788	45202788	45202788	45202788
	Matrix:	Water	Water	Water	Water
	Sampled on:	30-AUG-2004	30-AUG-2004	30-AUG-2004	30-AUG-2004
	Lab ID :	14046296	14046297	14046298	14046299
	Client ID:	04-5	04-6	04-7	04-8
Pb-DMS31	Lead Dissolved	44202291	44202291	44202291	44202291
PHC2PHCW	CCME PHC F2 C10-16	45701064	45701064	45701064	45701064
PKG-BT32	BTEX-CCME F1 WATER	45202788	45202788	45202788	45202788
	Matrix:	Water	Water	Water	Water
	Sampled on:	30-AUG-2004	30-AUG-2004	30-AUG-2004	30-AUG-2004
	Lab ID :	14046300	14046301	14046302	14046303
	Client ID:	04-9	04-10	DUPLICATE	ВН9
Pb-DMS31	Lead Dissolved	44202291	44202291		44202291
PHC2PHCW	CCME PHC F2 C10-16	45701064	45701064		45701064
PKG-BT32	BTEX-CCME F1 WATER	45202788	45202788	45202788	45202788
	Matrix:	Water	Water	Water	Water
	Sampled on:	30-AUG-2004	30-AUG-2004	30-AUG-2004	30-AUG-2004
	Lab ID :	14046307	14046308	14046309	14046310
	Client ID:	BH10	BH11	TRIP BLANK	FIELD BLANK
Pb-DMS31	Lead Dissolved	44202291	44202291		
PHC2PHCW	CCME PHC F2 C10-16	45701064	45701064		45202500
PKG-BT32	BTEX-CCME F1 WATER	45202788	45202788	45202788	45202788
	Matrix:	Water	Water	Water	Water
	Sampled on:	30-AUG-2004	30-AUG-2004	2-SEP-2004	30-AUG-2004



09-Sep-04 Page 13 of 13 **BLANK SUMMARY**

All method blanks were less than MDL



Sample ID: 46292

Method File: CCMEWW.M

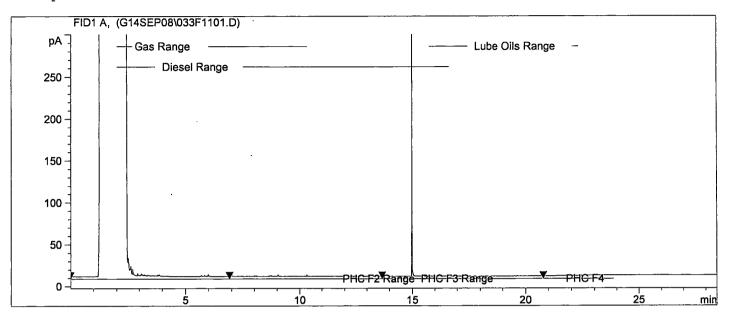
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Multiplier: 1

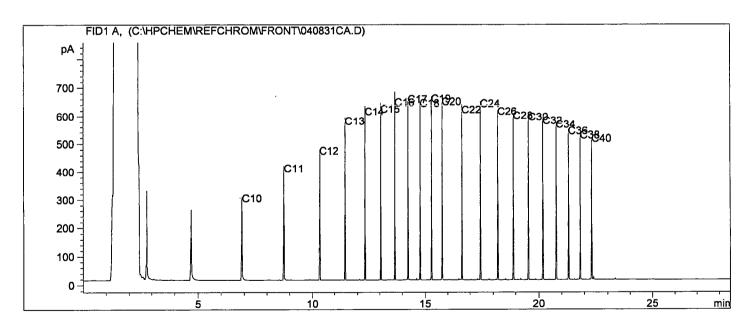
04-1

Operator: IT Vial: 33

Vial: 33 Sequence line#: 11



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



Sample ID: 46293

Method File: CCMEWW.M

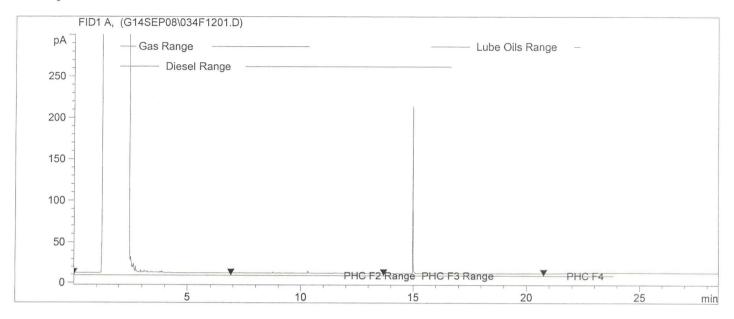
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Multiplier: 1

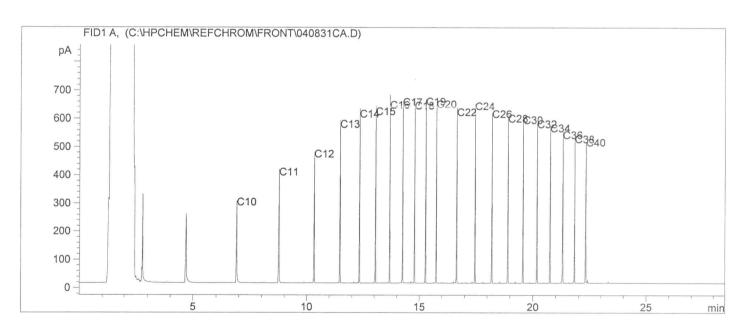
04-2

Operator: IT Vial: 34

Sequence line#: 12



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



Sample ID: 46294

Method File: CCMEWW.M

Date & Time Analyzed: 9/8/2004 8:09:29 PM

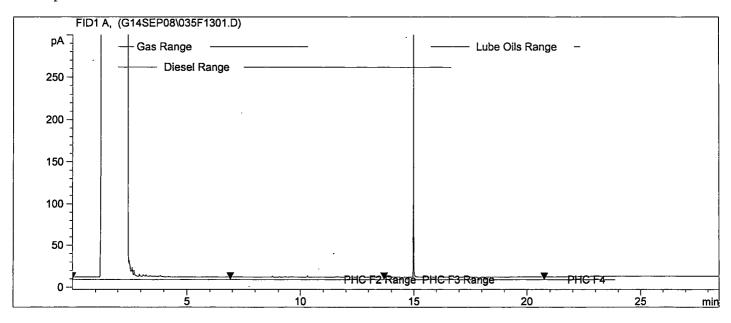
Multiplier: 1

04-3

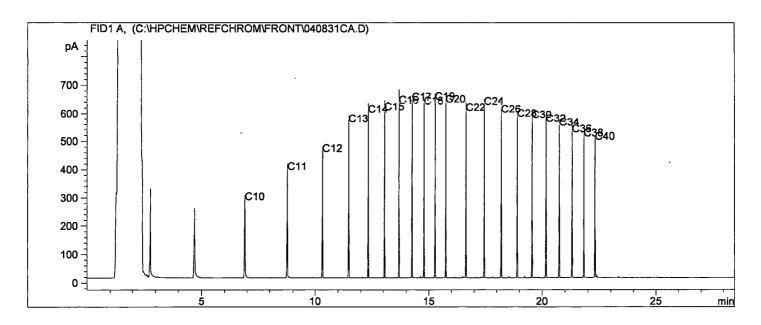
Operator: IT

Vial: 35

Sequence line#: 13



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C12 C4 Varsol: C12 C8 Kerosene: C7 C16



04-4

ANALYTICAL SERVICES

Operator: IT Vial: 36

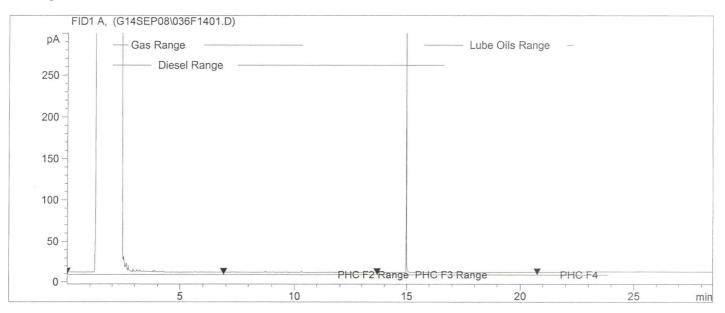
Sequence line#: 14

Sample ID: 46295

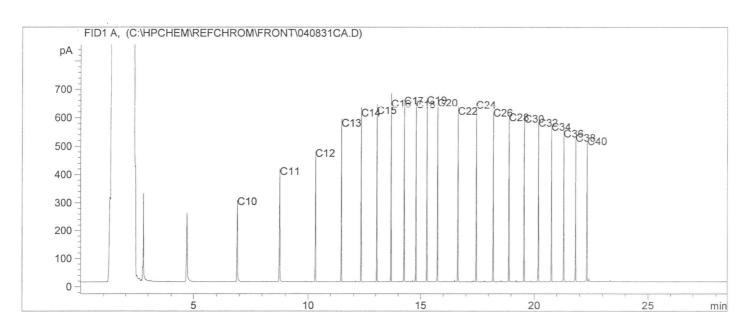
Method File: CCMEWW.M

Date & Time Analyzed: 9/8/2004 8:50:03 PM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

 Gasoline:
 C4 - C12
 Diesel:
 C8 - C22

 Varsol:
 C8 - C12
 Lubricating Oils:
 C20 - C40

 Kerosene:
 C7 - C16
 Crude Oils:
 C3 - C60+



Sample ID: 46296

Method File: CCMEWW.M

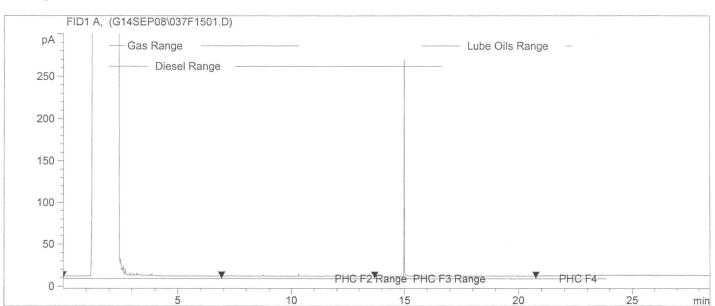
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Multiplier: 1

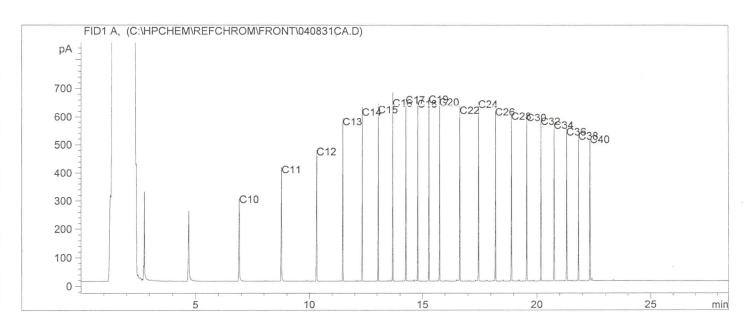
04-5

Operator: IT

Vial: 37 Sequence line#: 15



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16



04-6

ANALYTICAL SERVICES

Operator: IT Vial: 38

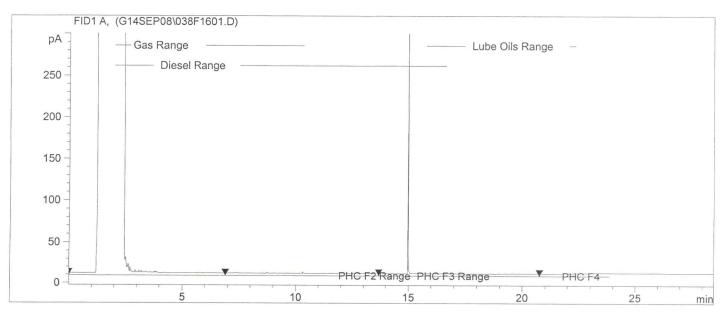
Sequence line#: 16

Sample ID: 46297

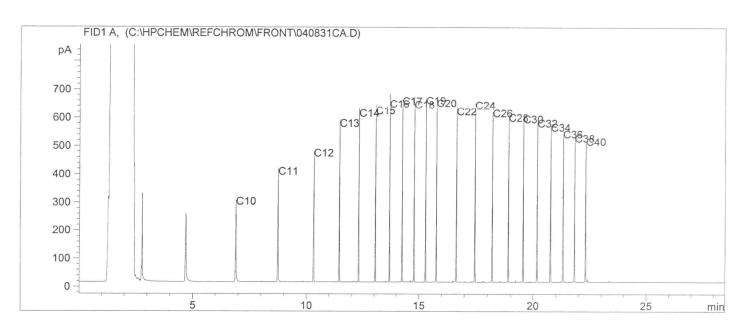
Method File: CCMEWW.M

Date & Time Analyzed: 9/8/2004 10:10:32 PM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 C12 Diesel: C8 -C22 C12 Varsol: C8 Lubricating Oils: C20 -C40 C7 C16 Kerosene: Crude Oils: C60+



Sample ID: 46298

04-7

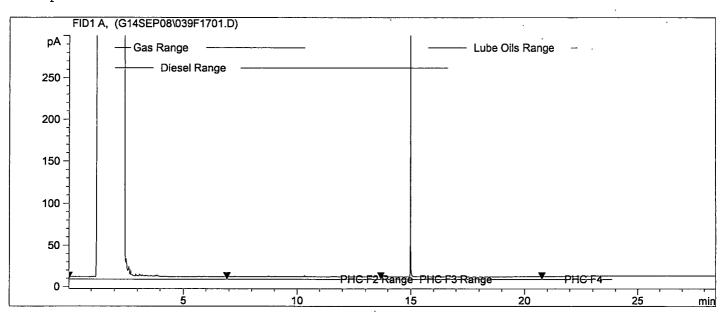
Method File: CCMEWW.M

Date & Time Analyzed: 9/8/2004 10:50:24 PM

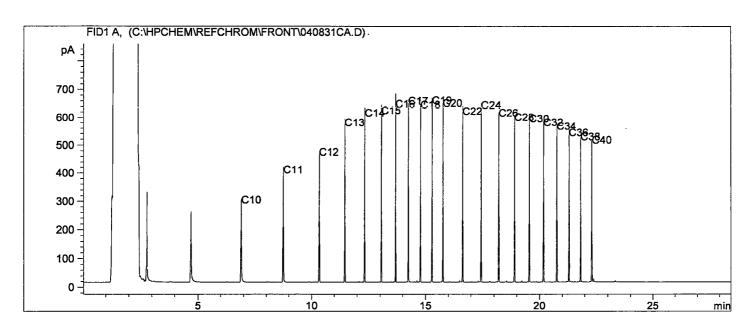
Multiplier: 1

Vial: 39 Sequence line#: 17

Operator: IT



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 C12 Varsol: C8 C12 Kerosene: C7 C16



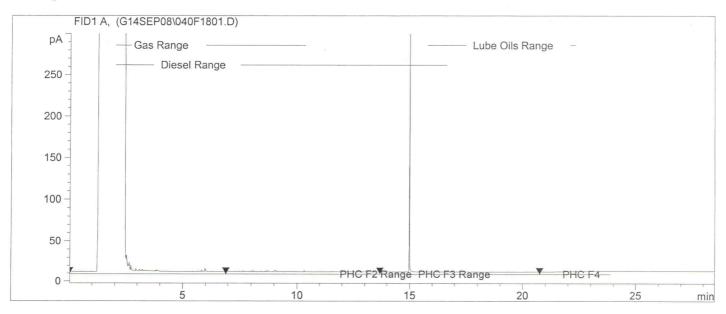
Operator: IT Vial: 40

Sequence line#: 18

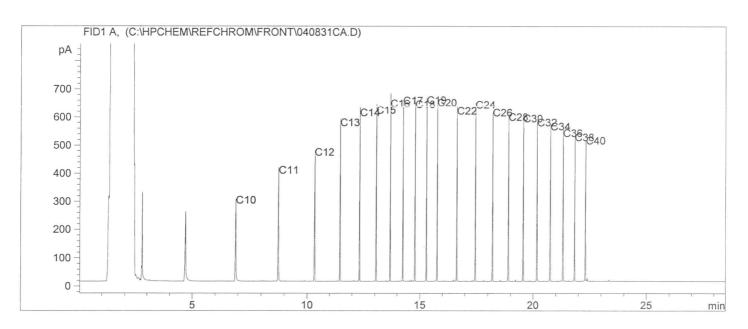
Sample ID: 46299
Method File: CCMEWW.M

Date & Time Analyzed: 9/8/2004 11:30:42 PM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Diesel: C8 -C22 - C12 Lubricating Oils: Varsol: C8 C20 - C40 Kerosene: C7 C16 Crude Oils: C3 C60+



ANALYTICAL SERVICES

Sample ID: 46300

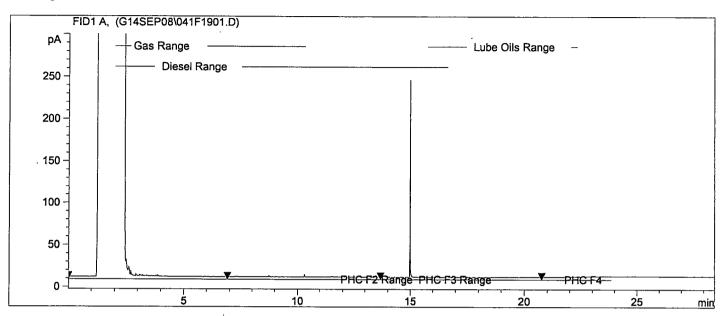
Method File: CCMEWW.M

Date & Time Analyzed: 9/9/2004 12:10:17 AM

Multiplier: 1

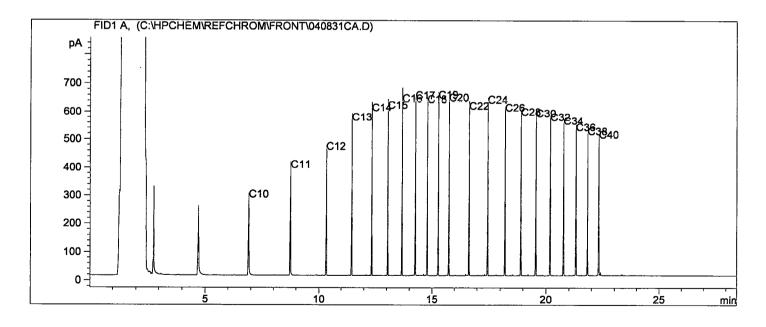
Operator: IT Vial: 41

Sequence line#: 19



04-9

Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16

Diesel: C8 - C22
Lubricating Oils: C20 - C40
Crude Oils: C3 - C60+



04-10

ANALYTICAL SERVICES

Operator: IT Vial: 42

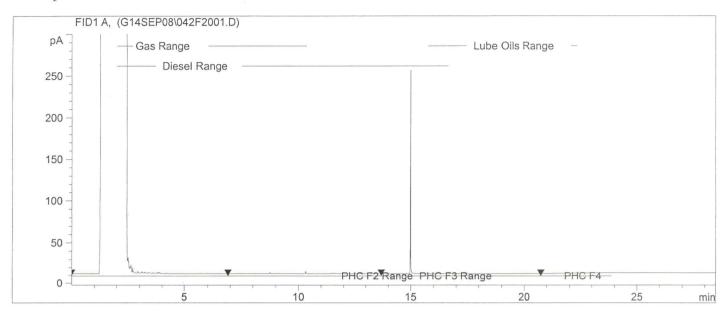
Sequence line#: 20

Sample ID: 46301

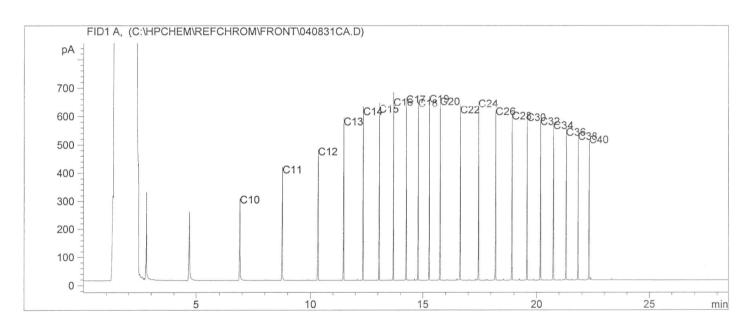
Method File: CCMEWW.M

Date & Time Analyzed: 9/9/2004 12:50:23 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16 Diesel: C8 - C22
Lubricating Oils: C20 - C40
Crude Oils: C3 - C60+



BH9

ANALYTICAL SERVICES

Operator: IT Vial: 43

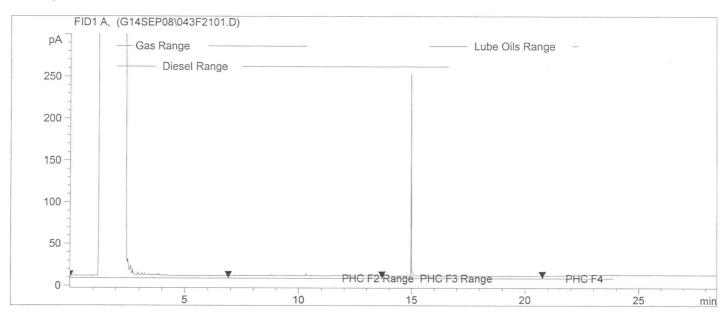
Sequence line#: 21

Sample ID: 46303

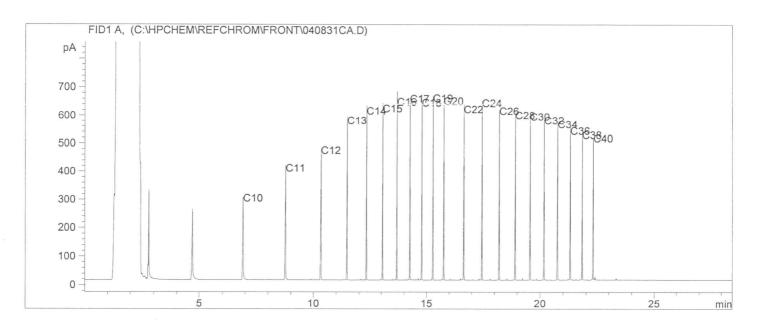
Method File: CCMEWW.M

Date & Time Analyzed: 9/9/2004 1:29:55 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16 Diesel: C8 - C22
Lubricating Oils: C20 - C40
Crude Oils: C3 - C60



BHID

ANALYTICAL SERVICES

Operator: IT Vial: 44

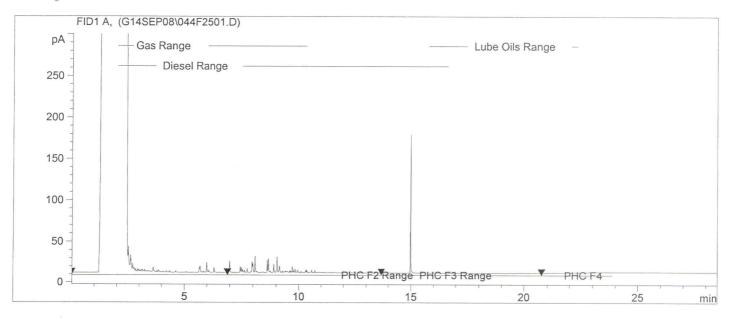
Sequence line#: 25

Sample ID: 46307

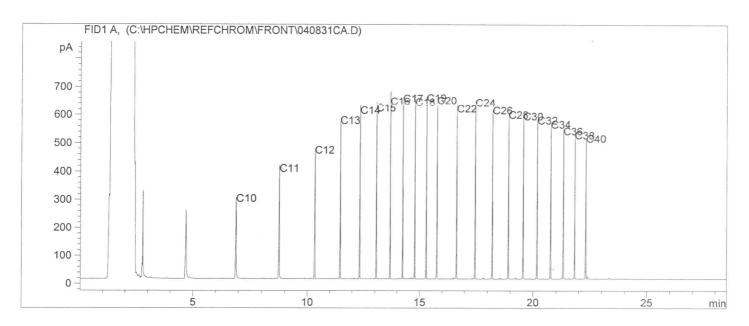
Method File: CCMEWW.M

Date & Time Analyzed: 9/9/2004 4:09:37 AM

Multiplier: 1



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

 Gasoline:
 C4 - C12
 Diesel:
 C8 - C22

 Varsol:
 C8 - C12
 Lubricating Oils:
 C20 - C40

 Kerosene:
 C7 - C16
 Crude Oils:
 C3 - C60+



ANALYTICAL SERVICES

Sample ID: 46308

Method File: CCMEWW.M

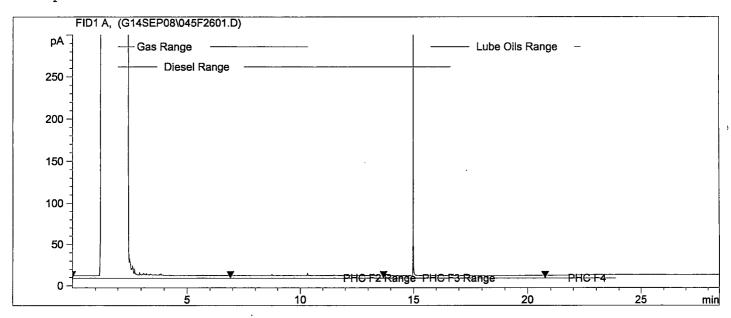
Date & Time Analyzed: 9/9/2004 4:49:19 AM

Multiplier: 1

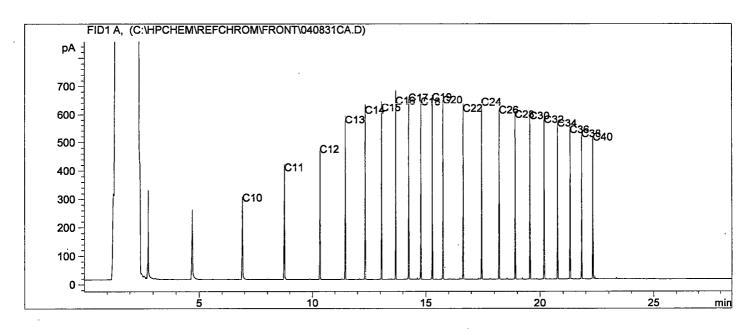
BH 11

Operator: IT Vial: 45

Sequence line#: 26



Carbon Range Reference Chromatogram at approx. 25ppm



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12 Varsol: C8 - C12 Kerosene: C7 - C16 Diesel: C8 - C22
Lubricating Oils: C20 - C40
Crude Oils: C3 - C60+

PSC A	NA	LY	TI	CA	LS	- SEI	RVI	CE	ES	- 1														he followin									t:	
Client:	7]	M &	c.										Da	te:_	S	ep	05	lo	4_			_ I	nit	tial: MF		C o	f C i	#:	81	1/2	240	6	*	
Sample# Sample# 125ML CLEAR GLASS	250ML CLEAR GLASS	1L AMBER GLASS	1L CLEAR GLASS		500ML AMBER GLASS	250 ML AMBER GLASS	500ML PLASTIC	Z50ML PLASTIC	250ML PLASTIC FILTERED	250ML PLASTIC HNO3	250ML PLASTIC FILTER/HNO3	250ML PLASTIC H2SO4	250ML PLASTIC FILT/H2SO4	250 ML PLASTIC NaOH	250ML PLASTIC NaOH/ZnAc	Microbiology Bottle	100ml AMBER GLASS H2SO4	A CACACACA A CA COMIL AMBER VIALS	3	PLASTIC BAG	AIR SAMPLE	OTHER:	PRESERVATIVE CHECK		1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Fem Brol No (C of Non Bott Ana Labd Sam Wro Incc	cen Borect of Constant of Cons	o degroottle in the sign of the sign of the sign of the ship of th	ed/dat of C in C of ment, I frement (miss red >5 red afte s) used rvation of bottl inple a Order	nsit ncomp ted by EC, bu but no nts abs sing/ar days a er hold n or H les (no vailab # pro	t not in t on C o ent/not dd/or ino after san I time	shipp of C clear correct mplin ce pro / cons ld)	ct) g
	Pou		off	an	ion				·	a If		1.0		· 1	2:47		daga	31/5	Ĺ,	7.	- 60	10		רער		1			T	empe	eratur	e	A	verage
Com	men	ts:			SI		10.01				u u			bel			J	3011	u		i 10:l	A 5			Coo Coo Coo	ler# ler#. ler#: ler#: dition	3	ice/ic	ce pa	cks:_				

DCC	ANAT	VTICA	T. SER	VICES
	AINA	, I I I	1 17 17 17	

SAMPLE INTEGRITY RECORD - The following bottles were received for the below project:

Client: Ame	2				÷		Dat	e:	Sy	0 (021	104				_ Iı	nitial:_	MF		C of	C #	#: 81		24	7	
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ANALYTICAL SERVICES	Burnaby, B.0	C. V5.	A 4N5	j	Tol	F I Fre	ax: (60	4) 444- 00-440-	4808 4511 4808												AN	ALY	SIS	RE	QU	ES1						8	11	12	47
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please contact lab

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Andrew Hooget

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ANALYTICAL SERVICES

PSC Analytical Services Inc. 8577 Commerce Court Burnaby, B.C. Canada V5A 4N5 Tel 604 444 4808 Fax 604 444 4511

INVOICE BC094841

Invoice date 30-SEP-04 Page 1 of 1 Consultant's Copy

Forms included : 08111246 08111247

Imperial Oil Ltd

237-4TH Avenue S.W.

P.O. Box 2480, Stn M

Calgary, Alberta

T2P 3M9

Client type : I Client code : L9

Sampler : M.MCGREGOR

Client project ID : WX05876

IOL Contract No : 20493

IOL Commitment No : 11045177

Attention of Andrew Hodgetts

Client account # : 6517

No.	Description of work	Factor	Basis for factor	Quan tity	Referenc Code	SAP
1	BTEX-CCME F1 WATER			16	FPKG-BT32 F	W'
2	Filtering & PresHNO3			12	SFTPSSPFP F	W
3	CCME PHC F2 C10-16			13	SPHC2PHCW F	W
4	Lead Dissolved			13	SPb-DMS31 F	W

Date Received: 02-SEP-2004 Date Reported: 09-SEP-2004

Consultant : AMEC EARTH & ENVIRONMENTAL

Consultant Contact : A.DESGROSEILLIERS

Consultant Project No.: WX05876

Site Location : 287 MAIN ST SELKIRK, MB 8602651 88001943

TERMS

Net 30 days after date of invoice 2% per month interest charged on all overdue accounts.

Please remit payment to:

PSC Analytical Services Inc.

5555 North Service Road, Burlington, ON, L7L 5H7

APPENDIX D SITE SENSITIVITY ANALYSIS

Table D1: On-Site (Commercial) Land-uses, key receptors and exposure pathways (CCME, 2001) (Surface soils < 1.5 m below grade) On-Site Land Use Classification (applicable land use in black) Industrial Exposure Agriculture Residential/Parkland Commercial Pathway Soil Contact Nutrient cycling Nutrient cycling Nutrient cycling Nutrient cycling Soil invertebrates Invertebrates Invertebrates Invertebrates PR Crops (plants) Plants Plants **Plants** 1 Human (child) Human (child) Human (adult) Human (child) Soil Ingestion Herbivores (wildlife) (wildlife) (wildlife) Human (child) Human (child) Human (adult) Human (child) Soil Human (child) Human (child) Human (child) Human (adult) Particulate Inhalation Groundwater/ Aquatic Aquatic Life Aquatic Life 2 Aquatic Life Surface life/Livestock Human (child) 2 Human (adult) Human (child) Water Watering Human (child) Child, outdoor Vapour Child, indoor PR Adult, indoor Inhalation (humans only) Produce, Child meat and (produce only) milk produced on site (humans only) Off-site migration of Soil/dust

- 1 Does not apply at this site. Surface is covered with asphalt pavement.
- Does not apply at this site. Shallow near surface groundwater at site is not in use and has no potential use. Domestic water is from obtained from municipal source. No surface water is present at or adjacent to the site.
- PR Potential Receptor.

		Commercial), key recept ub-Surface soils >1.5 m			
	On-Site	Land Use Classification	n (applicable land ι	ıse in	black)
Exposure Pathway	Agriculture	Residential/Parkland	Commercial		Industrial
Soil Contact	Nutrient cycling Soil invertebrates Crops (plants) Human (child)	Nutrient cycling Invertebrates Plants Human (child)	Nutrient cycling Invertebrates Plants Human (child)	1 1 1 1	Nutrient cycling Invertebrates Plants Human (adult)
Soil Ingestion	Herbivores Human (child)	(wildlife) Human (child)	(wildlife) Human (child)	1	(wildlife) Human (adult)
Soil Particulate Inhalation	Human (child)	Human (child)	Human (child)	1	Human (adult)
Groundwater/ Surface Water	Aquatic life/Livestock Watering Human (child)	Aquatic Life Human (child)	Aquatic Life Human (child)	2 2	Aquatic Life Human (adult)
Vapour Inhalation (humans only)	Child, outdoor	Child, indoor	Child, indoor	PR	Adult, indoor
Produce, meat and milk produced on site (humans only)	Child	Child (produce only)			
Off-site migration of Soil/dust					Human/Eco

- 1 Does not apply below 1.5 m as roots and invertebrates are not expected at this depth. Soil contact and soil ingestion/uptake by plants or humans are not practical at this depth.
- Does not apply at this site. Near surface groundwater at site is not in use and has no potential use.
 Domestic water is from obtained from municipal source. No surface water is present at or adjacent to the site.
- PR Potential receptor. Site is zoned for commercial use. Potential exists for construction of commercial building on property (likely with a slab on grade foundation).

A Irad II -		(Surface soils < 1.5		s and exposure path ow grade)	
	On-Site	Land Use Classific	cation	(applicable land use	in black)
Exposure Pathway	Agriculture	Residential/Park	land	Commercial	Industrial
Soil Contact	Nutrient cycling Soil invertebrates Crops (plants) Human (child)	Nutrient cycling Invertebrates Plants Human (child)	PR PR PR PR	Nutrient cycling Invertebrates Plants Human (child)	Nutrient cycling Invertebrates Plants Human (adult)
Soil Ingestion	Herbivores Human (child)	(wildlife) Human (child)	PR PR	(wildlife) Human (child)	(wildlife) Human (adult)
Soil Particulate Inhalation	Human (child)	Human (child)	PR	. Human (child)	Human (adult)
Groundwater/ Surface Water	Aquatic life/Livestock Watering Human (child)	Aquatic Life Human (child)	1	Aquatic Life Human (child)	Aquatic Life Human (adult)
Vapour Inhalation (humans only)	Child, outdoor	Child, indoor	PR	Child, indoor	Adult, indoor
Produce, meat and milk produced on site (humans only)	Child	Child (produce only)	PR		
Off-site migration of Soil/dust	,		9		Human/Eco

- Does not apply at this site. Shallow near surface groundwater at site is not in use and has no potential use. Domestic water is from obtained from municipal supply. No surface water is present at or adjacent to the site.
- PR Potential Receptor.

Table D4: 0	Off-Site (Commercial)	Land-uses, key re Surface soils > 1.5	1 1 1 1 1 1 1 1 1 1		ways (CCME, 2001)
	On-Site I	and Use Classific	ation	(applicable land use	in black)
Exposure Pathway	Agriculture	Residential/Parkl	and	Commercial	Industrial
Soil Contact	Nutrient cycling Soil invertebrates Crops (plants) Human (child)	Nutrient cycling Invertebrates Plants Human (child)	1 1 1	Nutrient cycling Invertebrates Plants Human (child)	Nutrient cycling Invertebrates Plants Human (adult)
Soil Ingestion	Herbivores Human (child)	(wildlife) Human (child)	1	(wildlife) Human (child)	(wildlife) Human (adult)
Soil Particulate Inhalation	Human (child)	Human (child)	1	Human (child)	Human (adult)
Groundwater/ Surface Water	Aquatic life/Livestock Watering Human (child)	Aquatic Life Human (child)	2 2	Aquatic Life Human (child)	Aquatic Life Human (adult)
Vapour Inhalation (humans only)	Child, outdoor	Child, indoor	PR	Child, indoor	Adult, indoor
Produce, meat and milk produced on site (humans only)	Child	Child (produce only)	1		,
Off-site migration of Soil/dust					Human/Eco

- 1 Does not apply below 1.5 m as roots and invertebrates are not expected at this depth. Soil contact and soil ingestion/uptake by plants or humans are not practical at this depth.
- Does not apply at this site. Near surface groundwater at site is not in use and has no potential use.
 Domestic water is from obtained from municipal supply. No surface water is present at or adjacent to the site.
- PR Potential receptor.

Table D5: Site Sensitivity Assessment

Receptor	Receptor Sensitivity	Likelihood of Impact	Sensitivity Ranking
1. Water Usage			
Groundwater which is or may be used for domestic supply - none	NA	NA	
Surface water used for domestic supply – none	NA	NA	
Surface water used for recreation, irrigation or supporting aquatic life – none	NA	NA	
Groundwater used for irrigation, cooling, etc none	NA	NA	
Water with no current or potential usage – shallow groundwater	Low	High	Site specific clean-up can be considered
Domestic water supply – Municipal services	High	Low	Site specific clean-up can be considered

<u>Site sensitivity ranking for water usage</u> – Site specific clean up may be considered, however, is not likely necessary as the likelihood of impacting groundwater receptors of medium to high sensitivity are considered low.

Inhalation Risk (vapours from soil and groundwater)			
On-site future use – commercial	Medium	Medium	Moderate
West –Residential (5 m)	High	Low	Moderate
North – Commercial (20 m)	Medium	Medium	Moderate
South – Commercial (20 m)	Medium	Medium	Moderate
East – Residential (60 m)	High	Medium	Moderate
Site sensitivity ranking for inhalation risk – Moderate	d aines 1000		
Residential properties to west are upgradient of groundwater flow measured	Since 1988.		
Ecological and Other Human Considerations			
		1.1: 1-	Moderate
On-site ecological soil contact – surface soils (≤ 1.5 m below grade) On-site ecological soil contact – subsurface soils (> 1.5 m below grade)	Medium	High	Moderate

4. Governing Risk Management Criteria

<u>Groundwater:</u> As there is no potential usage for the shallow groundwater at the site, and the site and surrounding developed properties are supplied with a municipal water system, the MOE non-potable groundwater criteria for fine to medium grained soils applies to the site.

<u>Soil:</u> Based on the moderate sensitivity of the site in sections 2 and 3 above and guidelines provided by Manitoba Conservation and the exposure pathways identified in Tables D1 through D4, AMEC has chosen the following CCME guideline for assessment purposes only:

- the Tier 1 commercial guidelines established by CCME EQG (1999, updated 2003) for BTEX (toluene guideline reflecting a non-potable groundwater area), lead, metals, PAH's, and glycol;
- the Tier 1 values as indicated in the 2001 CWS PHCs for the volatile and extractable petroleum hydrocarbons in the F1 to F4
 range for fine grained surface (at and above 1.5 m depth) soils governed by the ecological soil contact exposure pathway;
 and
- the generic values as indicated in the 2001 CWS PHCs for the volatile and extractable petroleum hydrocarbons in the F1 to F4 range for fine-grained subsurface (below 1.5 m depth) soils governed by the vapour inhalation (slab-on grade) exposure pathway.

Notes:

¹ – Sensitivity assessment based on Section 5 of the 1993 Manitoba Environment publication 'Petroleum Storage Sites: On-site Risk Management.

APPENDIX E CITY OF SELKIRK ZONING BY-LAW 4968 EXCERPTS

6. RESIDENTIAL ZONES

6.1. INTENT AND PURPOSE

The Residential Zones are intended to provide sufficient land for various types of residential development within the residential designations of the Development Plan.

6.2. ZONES

6.2.1. R Residential General

The "R" Residential General Zone provides for the establishment of single family dwellings and related compatible uses. Conditional approval may also be given for semi-detached or duplex buildings designed for and used by not more than two (2) families, each having exclusive residential occupancy of a dwelling unit. Each unit may have separate title.

6.2.2. R3 Residential Multiple-Family Dwelling

The "R3" Multiple-Family Dwelling Zone provides for the development of medium to high density multiple family housing developments such as duplexes, triplexes, fourplexes, town or row housing, lowrise and highrise apartments.

6.2.3. RR Rural Residential

The "RR" Rural Residential Zone has been established to provide land use guidelines for those areas having existing large lot residential development. While these areas will eventually evolve into more dense residential development, they currently lack necessary City services. Current uses, in addition to the residential component, also include part-time farming, hobby farming, equestrian uses and home occupations.

6.2.4. RM Residential Mobile Home

The "RM" Residential Mobile Home Zone provides for areas for the placement of mobile homes on spaces within a mobile home park, which are leased to the mobile home owner, or on individual registered lots which may be individually owned. Also includes associated service buildings. For more detailed regulations, refer to the City of Selkirk Mobile Home Park By-law and amendments thereto.

TABLE 12 Residential Use Table

P = Permitted

C = Conditional

P/C = see table 1

- = Not Permitted

Use	R	R3	RR	RM	Parking Group See Table 4
<u>A</u>					i is albed
Accessory uses, buildings or structures (as per Table 1)	P/C	P/C	P/C	P/C	N/A
E					
Education facilities	P	P	P	-	3
F Comment of the Comm					
Farm Activities – Livestock (see 3.17.)	_	-	C	-	N/A
H Washington and the same of t				177	
Halls: -public or private	С	P	P	P	6
Home Occupations (see 3.14.)	P	C	P	С	(see 3.14.2)
Hospitals or similar treatment centres	C	C	C	_	4
M					
Mobile Home Park (see 3.19.)	_	_	_	P	N/A
N					
Neighbourhood Commercial	С	С	_	С	11
P					
Planned Unit Development	_	С	_	С	1,11
Public:					
- facility	Р	Р	Р	С	8,9
- utility (no outside storage)	P	P	P	P	8,9
- utility (with outside storage)	C	С	С	С	8,9
R					La
Recreation Facilities:					
- public	С	С	С	С	6, 10
- commercial	С	С	С	С	6, 10
- parks and outdoor recreation areas	P	P	P	P	N/A
Religious Facility	С	P	P	P	2
Residential:					
- Care home; Family day care home; Private	P	P	P	P	4
day care home					
- Day care centre; Group day care home	С	С	С	С	4
- Neighbourhood Care home;	С	С	С	С	4
Neighbourhood Rehabilitation home					
- dwellings:				100	
-single family	P	-	P	P	1
-two family	С	P	С	-	1
-multiple-family	-	P	-	-	1

Use	R	R3	RR	RM	Parking Group See Table 4
Temporary Uses (see 3.29.)	-	С	P	P	N/A
Any other Residential use not listed in this table	С	С	С	С	see table

6.3. BULK REGULATIONS

All lots, buildings or structures in the residential zones must comply with the yard requirements as outlined in Table 13.

Table 13 Residential Bulk Table

Zone &	Front	Side Yd	Side Yd	Rear	Height	Max. Site	Site	Site Area	Unit Area
Building Type	Yard	Interior	Corner	Yard	(Max.)	Coverage	Width	Ft ²	Ft ²
	Ft.	Ft.	Ft.	Ft.	Ft.	%	Ft.		
Zone: R, R3									
-single family	20	5	10	25	30	40	55	5,500	800
-two family	20	5	10	25	30	60	55	6,600	1,200
-multi-family	25	5	15	25	45	60	75	10,000	480
									per unit
-non-	20	5	10	25	30	60	100	10,000	N/A
residential									
-accessory	Same as	2	Same as	2	15	10	N/A	N/A	1,000 Max
& temporary	Principal Use		Principal Use				·		
Zone: RR									
-single family	100	15	25	15	20	10	198	4 ac.	1,000
-accessory		ame as the		15	20	10	N/A	N/A	1,200 Max
Zone: RM			Refer	to City o	f Selkirk I	Mobile Hon	ie By-lav	7.	1

7. COMMERCIAL ZONES

7.1. INTENT AND PURPOSE

The Commercial Zones are intended to provide sufficient land for various types of commercial development within the commercial designations of the Development Plan.

7.2. ZONES

7.2.1 "C2" Central Commercial

This zone provides for appropriate land in the central business area for multi-functional uses such as retail business, multi-family residential, recreational, social, cultural and administrative land uses.

7.2.2 "C3" Strip Commercial

This zone provides sites for linear single or multi-tenant sites for multi-functional uses such as retail business, multi-family residential, recreational, social, cultural and administrative land uses along major collector or arterial streets. Uses primarily serve local clientele.

7.2.3 "C4" Highway Commercial

This zone provides for appropriate land to accommodate those businesses requiring large site areas and to provide retail and personal services adjacent to major transportation routes or arterial streets to serve the needs of the travelling public. Uses generally serve a broad regional clientele.

7.3. USE REGULATIONS

All proposed uses in the commercial zones must comply with the use requirements as outlined in Table 14. Uses identified as "conditional" must undertake a conditional use process before approval can be given.

Table 14 Commercial Use Table

P = Permitted

C = Conditional

P/C = see table 1

- = Not Permitted

Use	C2	C3	C4	Parking Group See Table 4
Accessory uses, buildings or structures (as per	P/C	P/C	P/C	N/A
Table 1)	I/C	r/C	F/C	IN/A
Agricultural Commercial	_	_	P	11
Amusement enterprise				
- outdoor	-	-	P	N/A
- within enclosed building	С	С	С	6
Animal shelter	-	-	P	N/A
Automobile:				
- body shop	С	P	P	11
- sales & service	P	P	P	11
- service station	P	P	P	11
- storage compounds	С	· C	С	N/A
- supplies	P	P	P	11
C	4-1			
Cabarets and cocktail lounges	P	P	P	6
Child and family care services:				
- family and group day care homes	- P	P	-	4
- day care centres and nurseries	P	P		4
Contractor's establishment:				
- enclosed within a building	P	P	P	12
- outdoor storage	-	С	С	N/A
<u>D</u>				
Dispatch services:				
- cleaning, couriers, taxi and similar services	P	P	P	9
E				
Education:		100		
- educational facilities	P	P	P	3
- public or private schools	P	P	P	3
F				
Funeral chapel, parlour	P	P	P	2

USE	C2	C3	C4	Parking Group See Table 4
H				
Hall – Public or Private	P	P	P	6
Health services	P	P	P	11
Home Occupations	P	P	P	N/A
Hotels and motels	P	P	P	7
Landscape:				
- contractors establishments	-	С	С	12
- landscaping or garden centres	P	P	P	12
Lumber & building supply:				
- enclosed within building	P	P	P	11
- outdoor storage	-	С	P	N/A
<u>M</u>				
Manufacture and sales:				
- carpentry or cabinetry	-	-	С	11
- monument and memorial products	-	-	С	11
Marina	С	-	-	11
P				
Personal service establishment	P	P	P	11
Professional Offices & support services	P	P	P	8,9
Planned Unit Development	-	P	P	N/A
Pool Hall / Billiard Parlour	С	С	С	6
Public:				
- facility	P	P	P	8,9
- utility (no outside storage)	P	P	P	8,9
- utility (with outside storage)	C	С	С	8,9
$\frac{\mathbf{R}}{\mathbf{R}}$				
Recreation vehicles:		D	D	1.2
- sales & service	- D	P	P	12
Religious facility	P	P	P	2
Residential:				
- Care home; Day care centre; Family day care home; Neighbourhood rehabilitation home	P	P	P	4
- within rear ½ or second storey	P	P	P	1
- single family dwelling	P	P	P	1
- multi family	P	P	P	1
Restaurants:				
- concessions	P	P	P	_
- eat-in	P	P	-	6
- drive through	С	С	С	11
Retail Business	P	P	P	11
T				
Temporary Uses (see 3.29)	P	P	P	N/A

USE	C2	C3	C4	Parking Group See Table 4
<u>V</u>			E	
Veterinary clinics (no compounds)	-	P	P	11
Other Commercial Use not listed in this table	С	С	С	Table 4

7.4. BULK REGULATIONS

All lots, buildings or structures in the commercial zones must comply with the yard requirements as outlined in Table 15.

Table 15 Commercial Bulk Table

Zone	Front Yard Ft.	Side Yd Interior Ft.	Side Yd Corner Ft.	Rear Yard Ft.	Height (Max.) Ft.	Max. Site Coverage (%)	Site Width Ft.	Site Area Ft ²
		1			cipal Uses	menter in a supplicated and the second and	1	
C2	0	0	0	2	75	100	17	1800
C3	40	0	0	10	30	60	50	5,000
C4	50	15	20	25	30	50	100	20,000
		90		Otl	ner Uses			
Fuel Pumps and related storage facilities	25	5	10	2	30	N/A	N/A	N/A
Accessory Other than fuel	40	5	10	2	30	N/A	N/A	N/A

7.5. COMMERCIAL DEVELOPMENTS ADJACENT TO RESIDENTIAL USES

For commercial uses that have interior side lot lines adjoining residential uses, the City may require development agreements to ensure compatibility with the residential uses. The development agreement may address, but is not limited to, such matters as:

- Landscaping
- Parking locations
- Fencing
- Outside storage
- Lighting
- Noise
- Dust

7.6. DEVELOPMEMENT STANDARDS

Development standards may be addressed through development agreements between the City and the developer. See 3.8. - Development Standards, and any development containing outside storage shall be in accordance with 3.10. Exterior Storage.

APPENDIX F UST DESTRUCTION CERTIFICATE

Manitoba Conservation



WORK-COMPLETION CERTIFICATE

INTERIM FORM

Certification of Work Completion Respecting the Construction/Alteration of Underground and Aboveground Petroleum Product and Allied Product Storage Tanks

Site Code #
I, REGAU OLAFSON being a duly authorized signing officer of (Petroleum Technician)
do hereby certify that I have completed the (Company Name)
Construction/Alteration located at 187 May St. Selking as detailed in the
"Application for Permit form to construct and alter dated June 28,
20 64, in accordance with accepted Industry and Department of Conservation
Standards and requirements. DAUE SIMPSON FOR THE OLD CONTROL (Contractor Signing Officer)

Please submit this Certificate immediately upon project completion to: Manitoba Conservation Suite 160, 123 Main St. Winnipeg MB R3C 1A5

Manitoba



Conservation

Site Information:

Environmental Operations Red River Region 123 Main Street, Suite 160 Winnipeg MB R3C 1A5 CANADA

UNDERGROUND & ABOVEGROUND PETROLEUM STORAGE TANK SYSTEM REMOVAL REPORT

This form is to be completed by the licensed petroleum technician and submitted to Manitoba Conservation after completion of the project.

Business Name:	MPGNO	n Oil Li	MIND			
Legal Description:	Lot(s)		Block	***	Plan	
	Address	s/City:				· · · · · · · · · · · · · · · · · · ·
						ge
	R.M. of					
Owner:					Phone	#
Owner: 267	HAIN	SELKIRK	MB		Postal	Code FLA 136
Licensed Petroleum T Mailing Address:	echnician: _ (-325	REGAN OL PARLL DALE,	ST. ANDER	EM 2	Phone Postal	#. W1.832.4561 Code RIABA RIA 3N9
Tank Information:						
1. Date Tank(s) Rem	noved:	Juny 13	>/04			
2. Condition of Tank	c(s):	Perforated	No Perforati	ons	Good Shape	Tank Size
	ank # 1.		/			22,500 L
	2.					22,500 L
	3.				/	27,500 L
	4.					22,500L
	5.					
	6.					
	7.					
	8.					

...2

-2-

3.	Associated Piping Removed: (Yes () No Condition: Good
	Tanks Destroyed: (Yes () No If No, indicate what was done with the tanks. DESTRACT ON -81TE IN DEMO BIN
Sit	e Assessment:
5.	Environmental Consultant Hired: AMEC Phone #. 24.488.2797
6.	Petroleum Odour noticeable in excavation: (Yes () No
7.	On site testing carried out: (/) Yes () No
8.	Soil Samples Submitted for Analysis: (// Yes (attach results) () No BY Consuction
9.	Soil Removed from Site: () Yes- Volume () No
	Soil Disposed at:
	Aug 16/04 DANG SIMPSON FOR REGAN DUATSON Simpson Fol Potrology Tochnician
	Date Signature of Licensed Petroleum Technician

APPENDIX G GRAIN SIZE ANALYSIS RESULTS

PARTICLE-SIZE ANALYSIS REPORT ASTM D422



ATTENTION: Andrew Hodgetts

Imperial Oil Limited P.O. Box 2480 Stn 'M' Calgary, Alberta

T2P 0H6

OFFICE:

WINNIPEG

PROJECT NO: WX05876

SAMPLED BY: AH

Selkirk IOL

COPIES TO:

Imperial Oil Limited

DATE SAMPLED:

PROJECT:

04-Aug-04

DATE RECEIVED: 17-Sep-04

DATE TESTED:

22-Sep-04

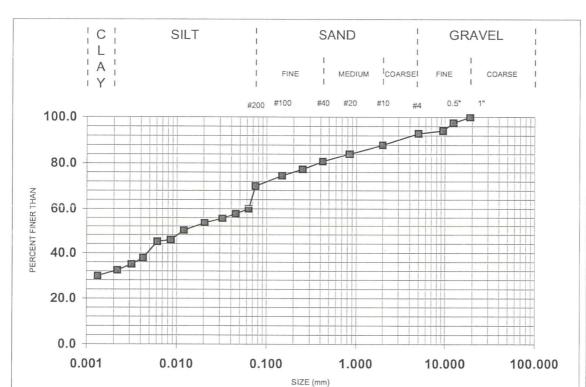
SOURCE / TEST HOLE: 4

SAMPLE NO .:

8

SAMPLE DEPTH:

5'



SIEVE	PERCENT
SIZE (mm)	PASSING
19.0	100.0
12.5	97.5
9.5	94.1
5.0	93.0
2.0	88.0
0.9	84.0
0.4	80.8
0.250	77.4
0.150	74.5
0.075	70.0
0.063	60.0
0.045	57.9
0.0321	55.7
0.0206	53.6
0.0120	50.0
0.0086	45.7
0.0061	45.0
0.0043	37.9
0.0032	35.1
0.0022	32.4
0.0013	29.9

CLASSIFICATION:

Silt, Clayey, Sandy, fine grained, brown, some gravel

TECHNICIAN:

KH

COMMENTS:

Hydrometer

AME

Per

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.

PARTICLE-SIZE ANALYSIS REPORT ASTM D422



ATTENTION: Andrew Hodgetts

Imperial Oil Limited P.O. Box 2480 Stn 'M' Calgary, Alberta

T2P 0H6

OFFICE:

WINNIPEG

PROJECT NO: WX05876

SAMPLED BY: AH

PROJECT:

Selkirk IOL

COPIES TO:

Imperial Oil Limited

DATE SAMPLED:

04-Aug-04

DATE RECEIVED: 19-Sep-04

DATE TESTED:

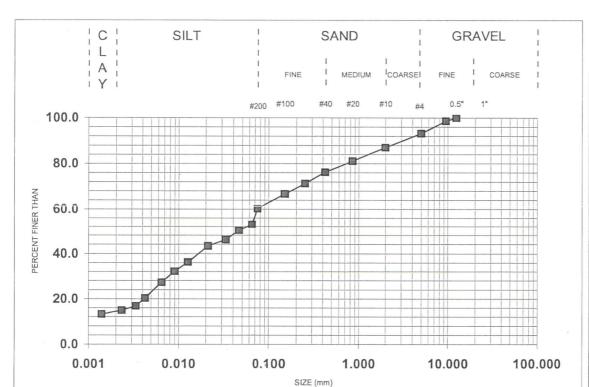
22-Sep-04

SOURCE / TEST HOLE: 4

SAMPLE NO .:

SAMPLE DEPTH:

22.5'



PERCENT
PASSING
100.0
98.6
93.2
87.1
81.1
76.2
71.3
66.7
60.2
53.0
50.3
46.1
43.3
36.3
32.2
27.3
20.3
16.8
15.0
13.2

CLASSIFICATION:

Silt, Sandy, poorly graded fine grained, brown, some clay and gravel present

TECHNICIAN:

KH

COMMENTS:

Hydrometer

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.

APPENDIX H HYDRAULIC CONDUCTIVITY TESTING RESULTS

HYDRAULIC CONDUCTIVITY TESTS FALLING HEAD TEST USING HVORSLEV'S METHOD

PROJECT: Inactive Esso Service Station 287 Main Street, Selkirk, MB

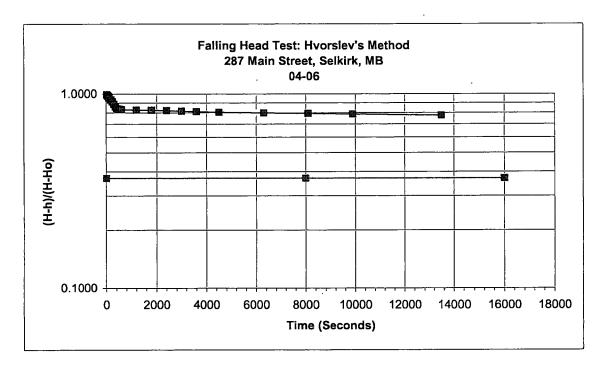
PIEZOMETER DETAILS

Identification:	04-06
Top of Screen (m)	6.7
Bottom of Screen (m)	7.6
Length of Screen (m):	0.9
Radius of Pipe (m):	0.0254
Radius of Sand Pack (m):	0.127
Static Water Level (m):	2.415
Water Level After Slugging (m):	0.265

Predicted "To" by Extrapolation

water Lev	ei After Slugging (m):	0.205		
		Calculated	Ī	
Elapsed 7	Γime	Elapsed	Measured	(H-h)/(H-Ho)
		Time	h	
Hours	Minutes	(seconds)	(m)	
	0	0	0.265	1.0000
	0.25	15		0.9967
	0.5	30	0.285	0.9907
	0.75	45	0.3	0.9837
	• 1	60	0.31	0.9791
	1.25	75	0.32	0.9744
	1.5	90	0.33	0.9698
	1.75	105	0.342	0.9642
	2	120	0.365	0.9535
	3	180	0.41	0.9326
	4	240	0.455	0.9116
	5	300	0.51	0.8860
	6	360	0.57	0.8581
	7	420		0.8419
	8	480		0.8372
	9	540		0.8349
	10	600		0.8326
	20	1200	0.635	0.8279
	30	1800		0.8256
	40	2400		0.8219
	50	3000		0.8163
	60	3600		0.8116
	75	4500		0.8056
	105	6300		0.7986
	135	8100		0.7930
	165	9900		0.7870
	. 225	13500	0.75	0.7744
		0		. 0.37
		8000		0.37
		16000		0.37

89635



CALCULATION OF HYDRAULIC CONDUCTIVITY

L	5.185 m	L=	screen length below initial
То	89635 s		groundwater level .

- k 2.57E-09 m/s
- k 2.57E-07 cm/s

HYDRAULIC CONDUCTIVITY TESTS FALLING HEAD TEST USING HVORSLEV'S METHOD

PROJECT: Inactive Esso Service Station 287 Main Street, Selkirk, MB

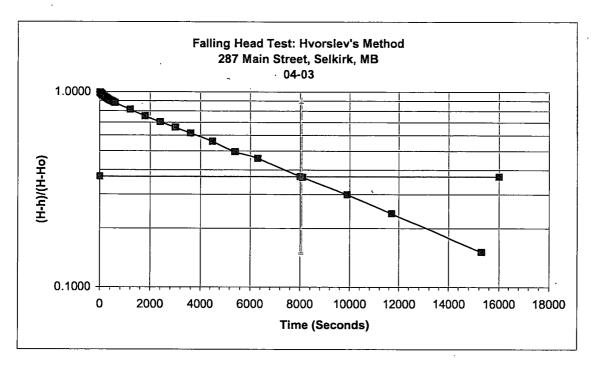
PIEZ	$\cap M$	F٦	FR	DE.	ΤΔΙΙ	S
FIEL						_3

Identification:	04-03
Top of Screen (m)	3.1
Bottom of Screen (m)	6.1
Length of Screen (m):	3
Radius of Pipe (m):	0.0254
Radius of Sand Pack (m):	0.127
Static Water Level (m):	1.71
Water Level After Slugging (m):	0.225

			Calculated	1	
Elapsed Time		Elapsed	Measured	(H-h)/(H-Ho)	
		Time	h	. , . ,	
Hours	Minutes		(seconds)	(m)	
		0	0	0.225	1.0000
		0.25	15		0.9933
		0.5	30	0.245	0.9865
		0.75	45	0.25	0.9832
		1	60	0.26	0.9764
		1.25	75	0.265	0.9731
		1.5	90	0.27	0.9697
		1.75	105	0.28	0.9630
		2	120	0.285	0.9596
		3	180	0.305	0.9461
		4	240	0.325	0.9327
		5	300	0.34	0.9226
		6	360	0.355	0.9125
		7	420		
		8	480		
		9	540		
		10	600		0.8788
		20	1200		
		30	1800		
		40	2400		
		50	3000		
		60	3600		
		75	4500		
		90	5400		
		105	6300		
		135	8100		0.3670
		165	9900		0.2997
		195 _.	11700		0.2391
		255	15300	1.485	0.1515
			0		0.37
			8000		0.37
			16000		0.37
			8045		0.9
			0045		0.45

8045

0.15



CALCULATION OF HYDRAULIC CONDUCTIVITY

L	4.39 m	L=	screen length below initial
То	8045 s		groundwater level

k 3.24E-08 m/s

k 3.24E-06 cm/s