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REPORT ON

Canada Creosote Site - North Bow Screening Level Risk Assessment Update

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REPORT

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Executive Summary

Golder Associates Ltd. (Golder) was retained by Alberta Environment (AENV) (now Alberta Environment and Sustainable Resource Development [ESRD]) to undertake a follow-up investigation and Screening Level Human Health Risk Assessment (HHRA) Update for the primarily residential area of Calgary, Alberta, located north of the Bow River and the former Canada Creosote site (the Site). The project study area is between 15th Street NW to 19th Street NW (east to west) and between Westmount Boulevard NW and Westmount Road NW (south to north). The Site is primarily developed with single-family homes, streets and alley ways.

This follow-up investigation and Screening Level HHRA Update was completed to address data gaps and recommendations outlined in the HHRA previously conducted by Golder in 2010 and 2011. Specifically, the objective of this investigation was to collect additional seasonal groundwater and soil vapour data at the Site, and to update the previous HHRA based on this new data. The soil vapour sampling events carried out as part of this investigation targeted times of year when groundwater levels were expected to be at their approximate lowest and the vapour risk was assumed to be at its approximate highest.

The scope of work for the follow-up investigation and Screening Level HHRA Update included advancing boreholes to bedrock, installing new groundwater monitoring wells and soil vapour probes, collecting groundwater and soil vapour samples, and preparing this Screening Level HHRA Update report. One additional groundwater monitoring event (November 2012) and two additional soil vapour monitoring events (November 2012 and April 2013) were completed in support of the updated HHRA. All investigation locations were on City of Calgary lands and within roadways, road allowances and alleyways throughout the Site.

The depth to groundwater was measured between 2.65 and 4.47 m below ground surface in October 2012. Groundwater laboratory results identified petroleum hydrocarbon (PHC) fraction F2, naphthalene, 2-methylnaphthalene and chloroform concentrations above the Alberta Tier 2 Soil and Groundwater Remediation Guidelines for the vapour inhalation pathway (*i.e.*, soil vapour intrusion) at multiple locations across the Site. Light, non-aqueous phase liquid (LNAPL or “free phase hydrocarbons”) was encountered in monitoring well MW10-6 in both 2012 (0.57 m in thickness) and 2013 (0.44 m in thickness). Non-aqueous phase liquid was not encountered in any other monitoring wells in 2012 or 2013, and as such, the conditions encountered at MW10-6 were interpreted to represent “worst case” conditions at the Site.

There are currently no Alberta Tier 1 Soil and Groundwater Remediation Guidelines for soil vapour concentrations; however, the soil vapour exposure pathway was assessed through the Screening Level HHRA using risk-based, site-specific soil vapour screening criteria developed in accordance with methods recommended by ESRD and Health Canada. During the previous HHRA, none of the measured soil vapour concentrations exceeded the site-specific screening criteria. Results of the 2012/2013 investigation identified, in general, relatively low concentrations of creosote related chemicals detected in soil vapour across the Site, with the primary exception being at MW10-6. At MW10-6, where LNAPL was detected, the soil vapour concentrations were significantly higher than the rest of the Site. The updated groundwater and soil vapour characterization results were consistent with a creosote contamination source.

The updated Screening Level HHRA identified possible unacceptable risks to residents and construction workers for several non-carcinogenic and one carcinogenic chemical associated with Site contamination using the maximum (*i.e., "*worst case") measured soil vapour concentrations at MW10-6. Soil vapour concentrations above the site-specific screening criteria were also detected at a few other locations: chloroform, which is not expected to be associated with creosote contamination, at one location (MW10-3B), and naphthalene at three locations (MW10-7B, MW10-11, and MW10-15). The measured soil vapour concentrations of naphthalene were approximately three orders of magnitude greater at the worst case location (MW10-6) than the concentrations measured at these other three locations. This suggests that the predicted potentially unacceptable risks are highest around the area in the vicinity of MW10-06.

It should be noted that the risk assessment incorporated several potentially conservative assumptions relating to factors such as the distance between the buildings and the source of subsurface contamination, and the assumption that no biodegradation occurs between the source of contamination and the building. In addition, no direct measure of soil vapour below homes was conducted as part of this investigation as all sampling points were in City right-of-ways well away from residential dwellings.

Based on the results of this Screening Level HHRA Update, further investigation and monitoring is recommended to evaluate the potential for soil vapour intrusion into houses in the area of monitoring well MW10-6. The program would consist primarily of soil vapour concentration delineation, and subslab and indoor air monitoring in houses near to MW10-6. Delineation of the NAPL near MW10-6 would also be valuable. Additional monitoring of seasonal concentration variability is also warranted to better understand conditions potentially influencing vapour intrusion (*e.g.*, monitoring during summer and winter conditions).

Table of Contents

TABLES

FIGURES

APPENDICES

List of Acronyms

AB	Alberta
AENV	Alberta Environment
BAF	biodegradation adjustment factor
BC MoE	British Columbia Ministry of Environment
bgs	below ground surface
BW	body weight
BTEX	benzene, toluene, ethylbenzene and xylenes
CALA	Canadian Association for Laboratory Accreditation Inc.
CARO	CARO Analytical Services
CAEAL	Canadian Association for Environmental Analytical Laboratories (replaced by CALA)
carcinogenic	cancer-causing chemical
CBC	Canadian Broadcasting Corporation
CCME	Canadian Council of Ministers of the Environment
CH_4	methane
CO_2	carbon dioxide
COPC	contaminant of potential concern
CSM	conceptual site model
CWS-PHC	Canadian Wide Standards - Petroleum Hydrocarbon Compounds (CCME guidance)
DF	difference factor
DNAPL	dense non-aqueous phase liquid (more dense than water)
DUA	domestic use aquifer
EMS	Emergency Medical Services
ESA	Environmental Site Assessment
ESRD	Alberta Environment and Sustainable Resource Development
F1	Petroleum Hydrocarbons in the carbon range of C6-10 (CCME)
F2	Petroleum Hydrocarbons in the carbon range of C11-16 (CCME)
FWAL	freshwater aquatic life
GC	gas chromatography
HHRA	Human Health Risk Assessment
HQ	hazard quotient
IARC	International Agency for Research on Cancer
ILCR	Incremental Lifetime Cancer Risk
IRIS	Integrated Risk Information System
LCS	laboratory control sample
LNAPL	light non-aqueous phase liquid (less dense than water)
MAXXAM	Maxxam Analytics Inc.

MDL	Method Detection Limit
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
NAPL	non-aqueous phase liquid
NELAP	National Environmental Laboratory Accreditation Program
O_2	oxygen
PAH	polycyclic aromatic hydrocarbons
PHC	Petroleum hydrocarbon
PIANO	paraffins, isoparaffins, aromatics, naphthenes, and olefins
PID	photo ionization detector
PQRA	Preliminary Quantitative Risk Assessment
ppm	parts per million (Equivalent to mg/Kg or mg/L)
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
QRA	Quantitative Risk Assessment
RL	reporting limit
RPD	relative percent difference
RsC	Risk-specific Concentration
SABCS	Science Advisory Board for Contaminated Sites (British Columbia)
SCN	Sample Control Number
SS-HASP	Site-Specific Health and Safety Plan
TRV	toxicity reference value
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
μg/L	micrograms per litre (Water)
$\mu g/m^3$	micrograms per metre cubed
VOC	volatile organic compound

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Alberta Environment (AENV) (now Alberta Environment and Sustainable Resource Development [ESRD]) to undertake a follow-up investigation and Screening Level Human Health Risk Assessment (HHRA) Update for the primarily residential area of Calgary, Alberta, located north of the Bow River and former Canada Creosote site, henceforth referred to as the "North Bow Site" or "Site" (refer to Figure 1 at the end of this report).

The project study area is between 15th Street NW to 19th Street NW (east to west) and between Westmount Boulevard NW and Westmount Road NW (south to north). The Site is primarily developed with single-family homes, streets and alley ways. There are also two churches, two parks, and properties occupied by the Canadian Broadcasting Corporation (CBC) Calgary Radio and Television, the Bow Valley Lawn Bowling Club, and Firehall and Emergency Medical Services (EMS) Station #6. The Site is approximately 650 m long and 350 m wide (refer to Figure 2). It should be noted that although groundwater data was collected on the CBC property, assessment of potential risk to occupants of the CBC was not included in the scope of work.

Golder's proposal for this project was dated August 23, 2011 with two Amendments dated November 16, 2011 and March 15, 2013, which increased the scope of work. The original written authorization to proceed with the work was provided by ESRD in October 2011.

1.1 Background

Golder was previously retained by ESRD in 2010 to prepare a human health risk assessment (HHRA) for the Site (Golder 2011a). The purpose of the HHRA was to assess possible human health risk associated with potential exposure to subsurface contamination (by residents or construction workers involved with buried utilities) that has migrated from the Canada Creosote Site, located south of the Bow River, to the North Bow Site area. Wood-preserving operations historically took place on the Canada Creosote Site and involved the use of tars, creosote, petroleum oils and pentachlorophenol. Prior to the 2011 HHRA, a number of investigations were completed by others at the Site and corresponding Canada Creosote Site, including a 2011 Phase I ESA of the Site completed by Golder (Golder 2011b). These previously conducted investigations have been comprehensively summarized in the 2011 Golder HHRA and summaries are not included in this report.

The results of the previously conducted 2011 HHRA indicated that the predicted risks for residents were negligible based on the soil vapour measurements collected on-Site. A potentially important finding of the HHRA was that groundwater elevations during the soil vapour investigation in March 2011 were relatively high, which appeared to be a result of water levels in the Bow River. Groundwater levels may be even higher in late spring due to spring runoff and consequent rise in the Bow River, but may be lower in late summer based on 2010 Bow River water level trends.

Of significance was that the depth to groundwater in late February 2011 at the borehole (MW10-7A) with the shallowest depth to bedrock (3.7 m below ground surface) was approximately 0.5 m less than the depth to the bedrock surface at this location. It was postulated that if the groundwater level were to decline to below the bedrock surface, there may be greater potential for contaminants within bedrock or in soil near the bedrock-soil interface to volatilize and consequently greater potential for elevated soil vapour concentrations. There were indications of creosote contamination above the bedrock contact at MW10-6 and within bedrock at MW10-7A. Additional monitoring of water levels and soil vapour concentrations was recommended to determine the significance of water table fluctuations.

In order to address data gaps identified in the HHRA, Golder recommended the following:

- Additional boreholes and monitoring wells should be constructed to assess the depth to bedrock and characterize contamination source non-aqueous phase liquid (NAPL) zones, focussing on the area with the shallowest bedrock observed during the 2011 field program (along Broadview Road NW), but moving outward from this area, as warranted. It was also recommended that consideration be given to a geophysical survey to supplement borehole data for evaluation of the bedrock surface but it was determined that such a survey was not warranted based on current objectives and stage of the investigation.
- A supplementary soil vapour probe installation program was recommended based on the results of the above bedrock characterization.
- Installation of water level transducers in select wells and regular water level monitoring in other wells was recommended.
- Monitoring of water level in the Bow River adjacent to the Site was recommended but due to challenges with installing a water level gauging station was not conducted. An additional soil vapour monitoring event was recommended when groundwater levels are lower.
- On the basis of the additional data obtained, the human health risk assessment should be updated and possible requirements for further assessment and monitoring should be evaluated.

This follow-up investigation and Screening Level HHRA Update was completed to address data gaps and recommendations outlined in the 2011 HHRA.

1.2 Objectives

The objectives of this investigation were to:

- Assess water levels within the Bow River and groundwater at the Site over the long-term;
- Install additional boreholes and monitoring wells at the Site to better assess the depth to bedrock and characterize the NAPL source zone;
- Complete soil vapour monitoring and sampling when groundwater levels are near their lowest point (based on seasonal trends) to evaluate if there is a greater potential for elevated soil vapour concentrations under these conditions; and
- Update the HHRA based on the results of the newly collected data.

1.3 Scope of Work

The original and amended scope of work for this follow-up investigation and HHRA Update included:

- Installing water level transducers in three monitoring wells at the Site to assess groundwater levels over time;
- Installing three deep monitoring wells and three shallow wells at the Site;
- Installing multi-depth soil vapour probes at six locations at the Site (*i.e.,* 12 probes in total);

- Advancing all boreholes to bedrock in order to assess the bedrock elevation at each location;
- Field screening of all previously installed and newly installed soil vapour probes for fixed gases and organic vapours;
- Collecting soil vapour samples using sorbent tubes from 26 soil vapour probes and collecting soil vapour samples using Summa canisters from three soil vapour probes in November 2012;
- Conducting helium tracer tests on all newly installed soil vapour probes;
- Groundwater monitoring of all monitoring wells installed at the Site;
- Collecting groundwater samples from four previously installed wells, all newly installed wells, and six wells located on the CBC property;
- Re-sampling of soil vapour from five locations in April 2013 to confirm November 2012 results;
- Collection of a NAPL sample from MW10-6 for characterization of product composition; and,
- Preparing this HHRA Update report.

1.3.1 Deviations from the Proposed Scope of Work

Due to the presence of overhead power lines and a buried gas line in the alley between Westmount Blvd. and Broadview Rd. NW, only one monitoring well and one vapour probe (MW11-04A and VP11-04B) could be installed within the alley. The proposed monitoring well located south of MW11-03 (proposed shallow well) was not installed. In addition, a hydrovac was required to advance the first 1.5 m of the boreholes at MW11-04, VP11-08 and VP11-09, which were all located within the alley.

Groundwater samples could only be collected from four newly installed monitoring wells as only five monitoring wells were installed at the Site in 2011 and monitoring well MW10-05 did not contain sufficient water to sample.

Sorbent tube soil vapour samples were only collected from 22 probe/well locations during the November 2012 sampling event. This included sampling the newly installed multi-depth soil vapour probes at six locations as well as ten existing probes/wells. The selection of probes/wells for laboratory analyses of sorbent tubes was based on the November 2012 field screening results, the 2011 soil vapour data (focussing on re-sampling locations with elevated concentrations), and to provide broad geographic distribution of testing across the Site.

2.0 REVIEW OF 2011 CONCEPTUAL SITE MODEL

The conceptual site model (CSM) that was formulated based on information from the 2011 Phase I ESA, review of historical reports (refer to summaries in Section 3.0 of the 2011 HHRA), and results of the 2011 HHRA are summarized below. The updated CSM is presented in Section 6.4.

2.1 Contamination Source Areas

Known areas with historic creosote-related NAPL impacts include:

- Along Broadview Road NW, creosote-related contamination was encountered during excavation for construction of a water main, both east and west of 18th Street NW; light non-aqueous phase liquid (LNAPL) was observed as a sheen on seepage water entering the excavation at depths inferred between

2.5 and 3 m below ground surface and dense non-aqueous phase liquid (DNAPL) was observed entering the base of the excavation at depths that were on the order of 5 m below ground surface (detailed information on depths was not provided in historical reports);

- At the CBC site, DNAPL was encountered in three wells completed within the bedrock where the depth to the top surface of the DNAPL in wells ranged from 3.9 m to 9.3 m depth below ground surface; and
- Along Memorial Drive, DNAPL was encountered at one well approximately half-way between 17th Street NW and a line extending south from 18th Street NW. Creosote staining was observed in fracture zones at depths of 1 m to 5 m below the soil-bedrock interface at several other boreholes along Memorial Drive.

The migration pathways for DNAPL are complex, and Keystone (2003) hypothesized that DNAPL may have migrated and possibly is continuing to migrate either on top of the bedrock surface or through fractures within the bedrock. The depth to bedrock based on historical information in areas where boreholes were completed within the North Bow Site area appears to be shallowest along Broadview Road NW near 18th Street NW where the depth at one location was approximately 5 m below ground surface (bgs). At the CBC and EMS sites, the depth to bedrock was approximately 7 m bgs. Variable thicknesses of DNAPL, which were up to approximately 8.5 m thick, were measured in three wells at the CBC site and one well along Memorial Drive. The thickness of DNAPL in a well does not reflect the thickness of DNAPL within the formation and is inferred to be highly exaggerated compared to the depth intervals that likely contain DNAPL within the bedrock. Although analysis of DNAPL migration is beyond the scope of this HHRA, the DNAPL in the bedrock may be under pressure and thus when a well penetrates DNAPL-containing fractures in the bedrock, the DNAPL pushes up in the well and partially fills the well. In the area of the CBC site, the bedrock appears to be overlain by clay, which may act as a confining unit that influences fluid pressures within the bedrock.

Results of the 2011 HHRA indicated that there is evidence of creosote impacts in bedrock and soil above bedrock at two monitoring wells along Broadview Road NW (MW10-6 and MW10-7A/B), which is generally consistent with the area with historical indications of NAPL. However, well MW10-6 is a short distance further west than the previous historical locations where NAPL was encountered. At well MW10-6, a creosote-like LNAPL sheen was encountered at the water table in 2011. The depth to bedrock was 3.7 m bgs at well MW10-7A near 18th Street NW and Broadview Road NW, and 6.5 m bgs at well MW10-3A along Memorial Drive. The historical investigations indicated a depth to bedrock of 5 m or greater.

The results of 2011 groundwater monitoring and sampling completed as part of the HHRA indicated elevated concentrations of naphthalene and petroleum hydrocarbon (PHC) fraction F2 in wells along Broadview Road NW in the general area of 18th Street NW that were consistent with locations of monitoring wells with observed creosote impacts. Other Site wells had significantly lower but detectable naphthalene concentrations.

The results of the soil vapour monitoring indicated elevated oxygen concentrations near to atmospheric levels indicating a well-oxygenated vadose zone, and relatively low carbon dioxide, methane and combustible vapour concentrations. The concentrations of analytes commonly associated with creosote, such as benzene, toluene, ethylbenzene and xylenes (BTEX), PHC fractions F1 and F2 were relatively low compared to other sites where higher soil vapour concentrations have been measured near to creosote-impacted soil. In addition, testing of soil vapour for a large list of the PIANO (paraffins, isoparaffins, aromatics, naphthenes, and olefins) compounds did not reveal other compounds of significant potential concern based on qualitative comparisons and the human health risk assessment. The depth to the water table was sufficiently high such that the NAPL source zones

appeared to be submerged in March 2011, which is consistent with a relatively weak vapour source and low soil vapour concentrations. If the groundwater level were to decline to below the bedrock surface, there may be greater potential for contaminants within bedrock to volatilize and consequently greater potential for elevated soil vapour concentrations. The elevated oxygen concentrations and somewhat elevated carbon dioxide concentrations suggest that aerobic biodegradation is a process that further reduces the concentrations of creosote-related vapours to relatively low levels.

2.2 Potential for Volatilization and Soil Vapour Fate and Transport Processes

An understanding of the contamination source is important because of the implications for volatilization and the potential for soil vapour intrusion. The greatest potential for volatilization exists where NAPL is present above the water table. The available historical information indicates that the depth to groundwater ranges between approximately 3.4 m to 4.3 m; for this depth range the known NAPL zones based on historical information would appear to be below the water table. When NAPL is below the water table, chemicals must diffuse upward through water within the saturated zone and capillary fringe before there is the potential for volatilization to the soil vapour phase. For a dissolved phase source, there is less potential for volatilization compared to a NAPL source above the water table given that chemicals must again diffuse through the capillary fringe. This conceptual model is described in greater detail in guidance prepared by Golder for the Science Advisory Board for Contaminated Sites (SABCS) of British Columbia (Golder, 2011b) and other research publications (*e.g.*, Golder, 2008a). When developing the CSM, possible seasonal fluctuations in the water table should be considered.

Within the vadose zone, the main processes affecting migration of creosote-related soil vapours are chemical diffusion and aerobic biodegradation, although sorption of chemicals into naturally-occurring organic carbon may also influence soil vapour transport. Soil gas advection may be a significant process close to buildings due to building pressures, which can be positive or negative, depending on building properties and weather.

The soil lithology within the vadose zone at the Site is variable, but based on historical information generally consists of near-surface topsoil and fill deposits, underlain by interlayered native deposits consisting of sand and gravel, sand and silty sand. At the CBC site, the vadose zone soils appear to be generally finer-grained than those observed to the west and consist primarily of sandy silt with variable gravel content.

2.3 Aerobic Biodegradation

For NAPL sources submerged below the water table or dissolved groundwater sources, the near-water table soil vapour concentrations will tend to be low to moderate and aerobic biodegradation typically results in relatively rapid attenuation of hydrocarbon vapour concentrations to non-significant concentrations. This CSM is supported through observations at other creosote or coal-tar sites (*e.g.*, Hers *et al.*, 2010) and extensive research at petroleum hydrocarbon sites (Ostendorf and Kampbell, 1991; Ririe and Sweeney, 1995; Ririe *et al*., 1998; Ostendorf *et al*., 2000; Hers *et al.*, 2000; Roggemans *et al*., 2002; Sanders and Hers, 2006; Davis *et al.*, 2009; Patterson and Davis, 2009). When evaluating aerobic biodegradation, the CSM should consider the potential for a capping effect where oxygen recharge to the subsurface is reduced through foundation slabs or paved surfaces. It is noted that while oxygen migration through concrete or asphalt is slower than through soil, it will occur. Excluding the CBC and EMS sites, buildings at the Site are detached houses with relatively extensive landscaped areas. There is a low potential for a significant capping effect and thus oxygen recharge is unlikely

to be significantly limited. Frost and snow cover have also been identified as possibly reducing oxygen recharge, and was evaluated as part of an in-progress research project conducted by Golder, but this effect was not observed at a research site in Saskatchewan during winter conditions (Hers *et al.*, 2011). The building footprint for the CBC building is larger but there are open landscaped areas as well surrounding most the building.

The CSM should also consider the potential for generation of methane and carbon dioxide (biogenic gases) under anaerobic conditions either within creosote NAPL source zones or naturally-occurring organic deposits (*e.g.*, peat bogs). Biogenic gases are important to evaluate from a safety hazard standpoint (*e.g.*, explosivity and asphyxiation) and methane when oxidized represents an oxygen sink or demand. The potential for biogenic gas generation will strongly depend on the size of the NAPL source zone and potential for anaerobic conditions to develop. Given that the NAPL at the Site has migrated several hundred metres within bedrock fractures or on top of bedrock surface troughs, there may be insufficient mass of NAPL for anaerobic conditions to develop from this factor alone.

2.4 Building Properties

The characteristics of the buildings are also potentially important in situations where soil vapour is able to migrate to the underside of the building (*i.e.*, in cases were soil vapour is not attenuated in the vadose zone). The CSM described above suggests that there may be significant aerobic biodegradation, which may prevent upward soil vapour migration toward houses from occurring. The key process potentially affecting soil vapour intrusion is soil gas advection. During the heating season, houses tend to be depressurized due to the stack effect (warm air rising in the house) and possibly due to furnace operation. Depressurization represents the driving gradient for soil gas advection into a building. The soil-air permeability and properties of the building foundation (*e.g.*, cracks, drains, sumps, and other openings) also influence soil gas advection. Other building related factors that potentially affect soil vapour intrusion include the type of foundation (*e.g.*, basement, crawlspace, or slab-at-grade), depth to the base of foundation below ground surface, size and height of the building, and building ventilation.

2.5 Preferential Pathways

Utility corridors backfilled with coarse-grained soil can in some instances be preferential pathways for transport of DNAPL or groundwater with dissolved impacts below the water table, or soil vapour above the water table. The potential for preferential DNAPL migration will depend on the conductivity of the utility corridor backfill to DNAPL flow compared to that of the native soils. At the Site, the vadose zone soils are generally coarse-grained, which would reduce the potential for preferential DNAPL migration along utilities.

Above the water table, preferential migration of soil vapour along utility backfill may be limited because there is likely little difference in the soil-air permeability of the coarse-grained native soil and utility backfill. In addition, if there were to be enhanced potential for hydrocarbon vapour migration, the same enhanced potential would also apply to oxygen transport, which would promote aerobic biodegradation. Therefore, based on the initial CSM, utilities are considered unlikely to represent significant preferential pathways for soil vapour transport at the Site.

Some houses at the Site may be basements with sumps, although this has not been confirmed, and verification of this was not within Golder's scope or work.

3.0 REGULATORY FRAMEWORK

Under the current Alberta regulatory regime as defined through the ESRD Alberta Tier 1 Soil and Groundwater Remediation Guidelines - December 2010 (AB Tier 1 Guidelines) and ESRD Alberta Tier 2 Soil and Groundwater Remediation Guidelines - December 2010 (AB Tier 2 Guidelines), there are three approaches available for the assessment, management and remediation of contaminated sites. The three approaches are:

1) Tier 1 – Generic remediation guidelines;

2) Tier 2 – Site-specific remediation guidelines based on the modification of Tier 1 Guidelines; and

3) Exposure Control – Risk management through exposure barriers or administrative controls based on site-specific risk assessment.

Tier 1, Tier 2 and Exposure Control are each intended to provide an equivalent level of human health and ecological protection. However, regulatory closure is only available for sites managed to achieve Tier 1 and Tier 2 remediation guidelines. Regulatory closure means that no conditions are imposed on the use of the site, within a given land use. On-going risk management and/or land use restrictions apply to sites managed under an Exposure Control scenario.

As part of the AB Tier 1 and Tier 2 Guideline approach, soil and groundwater guideline values are calculated for five types of land use: natural areas, agricultural, residential/parkland, commercial, and industrial. Land use determination is based on the most sensitive land use applicable to the site, or within 30 m of the site. Furthermore, soil grain size is also considered when comparing soil and groundwater quality data to Guidelines and when assessing contaminant groundwater transport. The AB Tier 1 and Tier 2 Guidelines calculate separate guideline values for coarse-grained soils (median grain size > 75 µm) and fine-grained soils (median grain size < 75 µm). The selection of appropriate guidelines is based on the soil type that controls contaminant migration at the site. Land use assessment and soil texture characterization is required to select the most appropriate AB Tier 1 or Tier 2 Guidelines for a given site.

3.1 Tier 1 Guidelines

The AB Tier 1 Guidelines are generic; that is, they are developed to protect sites at the more sensitive end of the land use range and can be used at most sites without any modification. The AB Tier 1 Guidelines are protective of both human and ecological receptors, and consider potential use of groundwater for potable purposes and protection of aquatic life. The Tier 1 Guidelines do not allow for the elimination of pathways or receptors. This can only be done under a Tier 2 Guideline approach.

The AB Tier 1 Guidelines are often used for the initial screening assessment of soil and groundwater environmental quality. If measured concentrations exceed the AB Tier 1 Guidelines, then a Tier 2 or Exposure Control approach may be necessary.

3.2 Tier 2 Guidelines

There may be site-specific circumstances that make the application of the AB Tier 1 Guidelines unnecessarily conservative in terms of potential human and ecological exposure, or that make the assumptions incorporated in the models underlying Tier 1 invalid. Under such circumstances, a Tier 2 approach may be necessary. There are three options for determination of guidelines under the Tier 2 approach:

1) Modifying the Tier 1 Guidelines by exclusion of exposure pathways and receptors that are not operable at the site;

2) Adjusting the Tier 1 Guidelines using site-specific values for certain modelling parameters determined from detailed site assessment data; and

3) Site-specific risk assessment.

Within the Tier 2 approach, exposure pathways for the protection of a Domestic Use Aquifer (DUA) or potable groundwater source, surface water supporting freshwater aquatic life (FWAL) and surface water used for wildlife watering may be excluded if not applicable. For all applications, the potential for future use of a surface water body must be considered regardless of current use. Similarly, where an aquifer is defined as a DUA or can be pursued for irrigation in agricultural land, the Tier 1 guideline for groundwater applies at any point in the aquifer, regardless of current water use.

The elimination of the DUA pathway under Tier 2 requires the completion of specific intrusive hydrogeological studies involving advancement of boreholes installed with monitoring wells and hydraulic conductivity testing. The FWAL pathway may be eliminated for petroleum hydrocarbon contaminants if the 100 year flood area of the surface water body is not within 300 m down-gradient, or 100 m up-gradient of a source of impact.

3.3 Exposure Control – Risk Management

Exposure Control relies on ongoing risk management to control risks to human and ecological receptors. This management option is generally used when it is not practical to achieve Tier 1 or Tier 2 Guidelines. While this option is available for management of risk at contaminated sites, it is not eligible for regulatory closure and ESRD may require the implementation of on-going risk management and/or land use restrictions, or until such time as concentrations have decreased below AB Tier 1 or 2 Guidelines.

3.4 Application of the Alberta Environment Guidelines

The AB Tier 1 Guidelines were derived using relatively conservative parameters and assumptions, corresponding to defined generic exposure scenarios and five generic land use categories. As such, they are intended and expected to be protective of human health and the environment in the large majority of cases. However, there may be situations in which AB Tier 1 Guidelines are not applicable, either where conditions violate one or more assumptions underlying the modeling used in the guideline derivation, or where actual exposure conditions or receptors at a site are more sensitive than those considered in the development of the generic exposure scenario.

Conditions where the guidelines are not applicable include the following:

- Contaminants present within 30 cm of a building foundation;
- Unusual structural building features;
- Groundwater flow to stagnant waterbodies;
- Groundwater within 10 m of a surface waterbody;
- Very coarse textured materials;
- Fractured bedrock;

- Contamination source length greater than 10 m (unless source volume is less than 300 m^3); and
- When inorganic contaminants occur in organic soils.

The AB Tier 1 Guidelines describe the assumptions for coarse-grained setting as follows:

"Groundwater velocity is a function of both hydraulic conductivity and hydraulic gradient and are assumed to be $1x10^{-5}$ m/s and 0.028 m/m, respectively, for Tier 1 Guideline derivation. The resulting Darcy groundwater velocity is 3 x 10^{-7} m/s. The rate of vapour transport through coarse soil is largely governed by vapour permeability, which is assumed to be $6x10^{-8}$ cm^2 for Tier 1 guideline derivation."

A soil-air permeability of $6x10^{-8}$ cm^2 (*i.e.*, approximately 6 Darcys) is representative of a fine to medium sand. As described in Section 6 of this report, the unsaturated zone soils at the Site include sand and gravel deposits, underlain by bedrock that includes fractures. While the AB Tier 1 Guidelines would likely not be applicable based on the above definition, for completeness, groundwater chemistry data has in this report been compared to the AB Tier 1 Guidelines for residential land use.

In Alberta, there are currently no remediation guidelines for evaluating the significance of measured soil vapour concentrations (*i.e.*, the AB Tier 1 Guidelines are limited to soil and groundwater). In the absence of soil vapour guidelines, Alberta Environment indicates that the Technical Guidance No.4 developed by the BC Ministry of Environment (MoE) (BC MoE, 2010) and/or draft Health Canada Vapour Intrusion Guidance may be used as a starting point for conducting a preliminary screening assessment of potential risks (Mr. Norman Sawatsky, Alberta Environment, personnel communication, May 31, 2011).

For the purposes of assessing soil and groundwater quality at the Site, the elimination of the drinking water / DUA pathway under Tier 2, and Exposure Control approaches were not considered at this time given the requirement to complete hydrogeological studies and/or to obtain stakeholder and ESRD's acceptance of a proposed Exposure Control approach.

Grain-size analysis was conducted on four soil samples collected during the 2011 HHRA. The results indicated that the percentage of soil particle size less than 0.075 mm (the threshold for fine-grained soil) was between 31% and 89%, and was greater than 50% for three of four samples, indicating one sample was classified as coarse-grained and three soil samples were classified as fine-grained. However, based on visual observation, the majority of the unsaturated soil was inferred to be coarse-grained.

The current City of Calgary land use designation for the Site is R-C2, Residential-Contextual One/Two Dwelling. Consequently, residential/parkland land use is considered applicable to the Site.

The nearest surface water possibly capable of sustaining aquatic life is the Bow River located approximately 45 m south of the Site. Therefore, the FWAL pathway cannot be eliminated under a Tier 2 guideline approach.

Based on the Site's land use designation and soil type, the applicable soil and groundwater guidelines are the AB Tier 1 Guidelines based residential/parkland land use for the most stringent between fine- or coarse-grained soil guidelines.

4.0 FIELD PROGRAM APPROACH, SCOPE AND METHODS

The field program approach, rationale, scope and methods are described in the following sections. The field program was completed in December 2011 (installation of monitoring wells and soil vapour probes), November 2012 (groundwater and soil vapour monitoring and sampling) and April 2013 (soil vapour re-sampling). Field work consisted of drilling of boreholes, installation of monitoring wells, installation of multi-depth soil vapour probes, collection and analysis of groundwater and soil vapour samples, and monitoring of water table elevations and NAPL thicknesses.

4.1 Field Program Methods

4.1.1 Health and Safety Plan

A Site-Specific Health and Safety and Environment Plan (SS-HASEP) was developed, reviewed, and approved prior to the start of work. A major component of the SS-HASEP was the identification of potential health and safety hazards associated with conditions and scheduled activities within the project area and implementation of the controls necessary to minimize the risk to people. All Golder staff and subcontractors working on the Site read, signed, and complied with the SS-HASEP throughout the course of the project.

4.1.2 Installation and Monitoring of Water Level Transducers

On December 5, 2011, Golder installed three dedicated water level transducers at the Site. Solinst Leveloggers were installed in monitoring wells MW10-2, MW10-15 and MW10-18, just above the base of each well. A Solinst Barologer was also installed in monitoring well MW10-2 to provide data needed for atmospheric pressure compensation. Golder personnel returned to the Site on December 16, 2011, January 10, 2012, January 23, 2013, April 2, 2012, May 8, 2012, August 21, 2012, October 12, 2012, March 8, 2013, April 8, 2013, April 24, 2013 and September 18, 2013 to download data from the transducers. Prior to removing the transducer from each well, the depth to groundwater was measured using an interface probe in order to calibrate the transducers.

4.1.3 Drilling and Monitoring Well/Vapour Probe Installation

Prior to the commencement of the subsurface work, all proposed borehole and monitoring well locations were marked in the field by Golder personnel. The underground utilities were cleared by Alberta One Call and the Utility Locators of Calgary on December 8th and 13th, 2011. A Licence of Occupation, Street Use Permit, Excavation Permit and Parking Ban were also obtained from the City of Calgary.

The drilling program was conducted from December 13 to 16, 2011. A total of eleven boreholes were advanced at eight locations within the Site using a Sonic Drill Rig operated by Tervita of Calgary, Alberta. Three boreholes were drilled at locations 11-01, 11-03 and 11-04 with a monitoring well (MW) installed in one of the boreholes and a multi-depth soil vapour probe (VP) installed in the second. The borehole and monitoring well locations are presented on Figure 3. Multiple-depth soil vapour probes were installed in six of the boreholes (VP11-01B, VP11-02, VP11-03B, VP11-04B, VP11-08 and VP11-09), deep groundwater wells were installed in three of the boreholes (MW11-01A, MW11-03A and MW11-06), and shallow groundwater wells were installed in two of the boreholes (MW11-04A and MW11-07). At locations where a monitoring well and multi-depth soil vapour probe were installed, the monitoring wells were identified as “A” boreholes, while the vapour probes were identified as “B” boreholes (see borehole logs in Appendix A). At previously installed locations where two monitoring wells were installed “A” refers to the deeper well and “B” refers to the shallower well.

Proposed shallow monitoring well MW11-05 could not be installed due to the proximity of overhead power lines and an underground gas line. Boreholes advanced within the alley located between Broadview Rd. and Westmount Blvd. (MW11-04, MW11-08 and MW11-09) were first advanced with a hydrovac operated by Badger Daylighting to a depth of approximately 1.5 m due to the proximity to an identified gas line. The Sonic drill rig was then used to complete the boreholes to the final depth required. Boreholes advanced across the Site were drilled to depths ranging from 2.7 to 8.5 m bgs. At five locations (MW11-01A, MW11-03A, MW11-04A, MW11-06 and MW11-07), boreholes were advanced to the bedrock interface in order to determine the bedrock elevation at these locations. Wells MW11-01A, MW11-03A and MW11-06 were completed in the bedrock while MW11-04A and MW11-07 were backfilled with hydrated bentonite prior to installation of the well within the overburden.

The soil stratigraphy was logged using Golder's Soil Classification System which is a modified version of the Unified Soil Classification System (USCS) Standard Practices for Soil Description. Soil samples were collected at approximate 0.7 m intervals, when lithology changed or when obvious indicators of impact were encountered. Each soil sample was placed into a re-sealable plastic bag for measurement of the headspace vapour concentration. Organic vapour concentrations in the bag headspace were measured using a MiniRae 3000 photoionization detector (PID) with a 10.6 eV lamp. The results of the headspace vapour testing can be found on the borehole logs in Appendix A.

One composite soil sample was submitted for waste characterization for disposal of drill cuttings. The composite sample was given a unique identification number, logged onto a formal chain-of-custody form, and transported on ice to Maxxam Analytics, Inc. (Maxxam) of Calgary, Alberta. The soil cuttings were placed in 205 L steel drums and temporarily stored on-Site. The drums were subsequently picked up and transported for off-site disposal by Tervita of Calgary, Alberta.

4.1.4 Monitoring Well/Soil Vapour Probe Construction

Construction details of the monitoring wells and soil vapour probes are provided on the borehole logs provided in Appendix A. Monitoring wells were constructed of 50 mm diameter PVC pipe and no. 10 slot screen. A sand pack of 10/20 environmental grade silica sand was used to surround the well screen to approximately 0.3 m above the top of the screen. Bentonite chips hydrated with potable water were placed above the sand pack to just below ground surface. Stainless steel flush-mounted well casings were placed over the wells and cemented in place. For deep monitoring well installations, 1.5 m of screen was placed below the water table and within bedrock. Screen lengths for shallow wells ranged from 2.4 to 2.7 m and straddled the water table of the unconfined water-bearing coarse-grained soil unit. Monitoring wells were assembled without the use of glues or solvents that might compromise the quality of water or soil vapour samples.

Multi-depth soil vapour probes consisted of two stainless steel AMS Gas Vapour Implants (0.15 m long by 1.3 cm in diameter), connected to ¼ in. diameter Teflon lined tubing, and placed at varying depths. A minimum 0.3 m thick hydrated bentonite seal was placed above and below each soil vapour probe, which was located within a sand pack that extended over a 0.45 m to 0.76 m vertical interval. Soil vapour probes were completed with compression fitting ball valves that remained closed except when soil vapour samples were obtained.

4.1.5 Soil Vapour Sampling and Field Monitoring

Based on data collected by the water level transducers, the lowest groundwater levels of the year were inferred to occur during November or December, prior to ice dams forming in the Bow River. A decision was made to conduct the groundwater and soil vapour sampling in November 2012 based on data downloaded from the transducers on October 12, 2012. Monitoring of water table elevations and NAPL thicknesses was conducted on October 30, 2012. Soil vapour field screening and sampling was carried out from November 2 to 12, 2012.

The procedures documented in Golder's best practice manual for soil vapour characterization prepared for the SABCS (Golder, 2011c) and sampling guidance developed by Golder for Health Canada (Golder, 2008b) were followed. Golder's soil vapour sampling kit was used for sample collection. In summary, the following protocol was followed:

- Probe equilibration (one week minimum);
- Probe performance check (flow and vacuum);
- Leak tracer test using helium;
- Field screening for fixed gases (oxygen, carbon dioxide and methane) and organic vapours (see description below); and
- Purging and collection of soil vapour samples for laboratory analysis.

The probe performance check consisted of measurement of soil gas flow rate and vacuum (refer to Table 1 at the end of this report). The sampling flow rate was measured using an inline Bios® Defender 510-M primary flow meter. Vacuum measurements were taken using Dwyer® Magnehelic diaphragm pressure gauges. The measured vacuums ranged from <0.1 inch H_20 to 1.7 inch H_20, for soil gas flow rates between 0.95 L/min and 1.0 L/min. It is noted that lower soil gas flow rates than those used for the probe performance test were used for soil gas sampling. The measured vacuums were generally lower in November 2012 in comparison to those measured in March 2011. This is likely due to lower groundwater levels in the monitoring wells used for vapour sampling. The range in the measured vacuum reflects the variability in the soil-air permeability, which is expected based on the variability observed in the soil types at the Site. No measurements were obtained at MW10-9B (deep probe) due to slowly rising vacuums that were greater than approximately 25 inch H_20. The results suggest that this probe is located within or close to the capillary fringe or was plugged.

Leak tracer tests were conducted on newly installed soil vapour probes to determine if ambient air could penetrate the ground surface (*e.g.*, along the outside of the probe) and mix with soil vapours during sampling, also known as short-circuiting, or if the valve was leaking. Leak tracer testing was conducted concurrent with purging and field screening of the soil gas wells/probes. A 5 L plastic bucket was used as a shroud. The shroud was placed over the well/probe and valve and filled with a minimum of 30% helium during the well/probe purging. The well/probe was purged and the helium concentration in the Tedlar bag was measured using a Dielectric® MGD-2002 helium detector.

To assess the results of the leak test, the percent leakage was calculated, as the helium concentration measured in the soil gas sample divided by the helium concentration beneath the shroud (multiplied by 100). Guidance documents indicate that leakage is of potential significant concern when the leakage exceeds 1 to 10% (ITRC, 2007; Golder, 2008b). The measured leakage of newly installed soil vapour probes ranged from zero to 0.38 % (Table 1). The leak testing results indicate minor leakage for a few samples but are considered within acceptable limits.

Prior to collection of the soil vapour samples for laboratory analyses, soil vapour probes were purged of air using a SKC® pump set to a flow rate of between approximately 0.95 L/min to 1.0 L/min. Approximately three probe volumes of air were purged from each probe. Soil vapour samples were obtained for field screening using a SKC® Vac-U-Chamber™ and 1-litre SKC Tedlar® bag to eliminate cross-contamination from soil gas passing through a pump. Dedicated 6 mm-diameter Teflon tubing was also used to connect the probe valve to the soil vapour screening equipment. Highly chemical resistant, re-usable, 6 mm-diameter Teflon® tubing and stainless steel connections were used with the soil vapour sampling kit, which included the SKC Vac-U-Chamber, pressure gauges, and flow meter. During the purging process, soil vapour samples were sequentially obtained after approximately 1, 2 and 3 probe volumes. The soil vapour samples were screened in the field using a RKI Eagle 2 detector for the following parameters: organic vapours, as measured by a PID, combustible gases, by a platinum sensor and calibrated to hexane, oxygen (O_2), and carbon dioxide (CO_2). The samples were then screened in the field for methane (CH_4) using a GEM 2000 Landfill Gas Detector. The sequential purge results are presented in Table 2 while soil vapour concentrations measured at the end of the purging process are presented in Table 1.

Soil vapour purging was not completed (headspace reading only) at wells MW10-3A, MW10-A, MW10-9A, MW11-01A, MW11-03A and MW11-06 as the water table was above the well screen. Vapour purging was not possible at MW10-9B–deep probe due to extremely low flow conditions (possibly due to probe damage) and high vacuum readings observed during purging. This high vacuum is consistent with the 2011 field results. Soil vapour purging was not possible at MW10-14 as the well was discovered to be blocked at 1.73 m depth.

Following field screening, the probe valve was closed and the probe was left to stand for approximately one to three days prior to sample collection, after which one probe volume of vapour was removed prior to sampling. Soil vapour samples were collected from applicable wells and probe locations using new Teflon lined tubing and Swagelok fittings. The samples were collected using sorbent tubes supplied by CARO Analytical Services of Richmond, BC (CARO). The sampling duration was 15 minutes while the average flow rate ranged between 199 and 232 ml/min (sample volume of approximately 3 to 3.5 L). The flow rate was measured during the entire sampling process. Quality control testing in November 2012 consisted of the collection of sorbent tubes in series from two locations as well as duplicate samples from two locations. The sorbent tube samples were shipped to CARO and analyzed for a wide range of volatile compounds including creosote-related compounds, petroleum hydrocarbons and halogenated solvents.

In November 2012, three soil vapour samples were collected from MW10-6 [well], MW11-08 [deep probe] and MW11-09 [shallow probe] using 6-Litre Summa canisters with flow restrictors set to collect an approximate 1-hour sample at a flow rate of 100 ml/min. The Summa canisters were connected directly to the dedicated valves on the soil vapour probes/well using new 6-mm diameter Teflon tubing and Swagelok connections. Initial and final canister vacuums were recorded using the vacuum gauge supplied by the laboratory. The Summa canisters were shipped to TestAmerica of Austin, Texas for analysis by method U.S. EPA TO-15 for an extended PIANO (paraffins, isoparaffins, aromatics, naphthenes, and olefins) list of compounds.

Based on an initial review of soil vapour results from the November 2012 sampling program and subsequent discussions with ESRD, it was determined that there was value in re-sampling a number of soil vapour probes in order to confirm the November 2012 results. The re-sampling event targeted five well or probe locations and was conducted on April 24 and 25, 2013.

Based on water level data from 2012, the water levels appeared to decrease in March/April 2013 to similar levels observed in November 2012. Golder conducted the soil vapour re-sampling during April 2013 to be consistent with groundwater levels experienced during the November 2012 sampling event.

During the re-sampling event, purging and sampling was completed at five locations at the Site (MW10-6 [well], MW10-15 [well], MW10-7B [deep probe], MW10-16 [well] and MW10-11 [well]) in a manner similar to the November 2012 event. The only differences from the above noted procedure for the April 2013 sampling was that the field screening was conducted using an RKI Eagle detector for combustible gases, CO_2 and O_2 while a PID was used for measuring organic vapours. Field screening for CH_4 was not conducted as values have historically been 0%. The April 2013 samples were collected immediately following purging without a several day wait period as was the case in November 2012. The April 2013, sorbent tubes and Summa canister soil vapour samples were analyzed for the same parameters as noted in the November 2012 sampling event.

In April 2013, quality control testing consisted of the collection of sorbent tubes in series from one location. The collection of distributed pair quality control samples was also attempted during field collection but pump failure occurred for one of the tubes and thus these samples were discarded. One set of field duplicate samples was submitted for the Summa canister analyses.

The summarized results of soil vapour chemical analyses from both the November 2012 and April 2013 events are presented in Table 3 and the laboratory reports are found in Appendix B, while QA/QC results are presented in Table 4.

4.1.6 Groundwater Monitoring and Sampling

Monitoring of water table elevations and NAPL thicknesses was conducted on October 30, 2012. Groundwater monitoring and sampling was carried out on November 12 and 13, 2012 after the soil vapour sampling had been completed.

The Site investigation called for the monitoring of all program wells. Groundwater sampling was conducted at the five newly installed wells, four existing on-Site wells and six monitoring wells on the CBC property. This protocol was followed with the exception that groundwater samples could only be collected from four of the five newly installed monitoring wells, as well MW10-05 did not contain sufficient water to sample.

The groundwater level and presence/absence of NAPL were measured using an electronic water/interface level probe. The results of the groundwater levels and field screening are presented in Tables 5 and 6. In order to prevent potential cross-contamination, the probe was washed with laboratory-grade detergent and rinsed with de-ionized water between wells. The well headspace was monitored for combustible gases (platinum sensor) and organic vapours (photoionization detector (PID)) during groundwater sampling using the RKI Eagle 2, with results presented as part of Tables 5 and 6. Headspace was monitored by quickly removing the well can and placing the RKI Eagle tip inside the well. A seal was formed around the RKI Eagle using a nitrile glove.

The ground elevation and the top of PVC pipe elevation of the five new monitoring wells were surveyed by Golder personnel using a Leica Rugby 100 Laser Level. Existing program wells with known elevations were used as local benchmarks for the survey and the new wells were tied into the existing program. Elevations are provided with water elevation data in Table 5.

The newly installed monitoring wells were developed by removing at least three well volumes of water or until dry using dedicated Waterra™ tubing equipped with a foot valve or a dedicated disposable PVC bailer. The monitoring wells were subsequently purged of at least three well volumes or until dry prior to groundwater sample collection. Sampling was conducted using dedicated bailers or Waterra™ foot valves. During purging, groundwater field parameters (temperature, pH, electrical conductivity, oxidation-reduction potential, and dissolved oxygen) were measured using a YSI digital multimeter (refer to Table 5). Groundwater samples were collected in laboratory-supplied sample bottles and preserved in the field, as required. Monitoring wells that contained NAPL were not sampled.

Immediately upon collecting the samples, the sample bottles were placed into a chilled cooler pending laboratory analysis. Fourteen groundwater samples (plus one duplicate sample) were submitted to the laboratory for analysis of volatile organic compounds (VOCs), BTEX, PHC fractions F1 to F2, and polycyclic aromatic hydrocarbons (PAHs). The samples were submitted to Maxxam of Calgary, Alberta for chemical analysis. The results of groundwater chemical analyses are presented in Tables 7 and 8, while quality assurance/quality control results are presented in Table 9. Laboratory reports are presented in Appendix B.

The purge water recovered from the wells was placed in a 205 L steel drum for temporary storage on-Site, and subsequently removed and disposed of off-site by Tervita.

During the follow-up sampling event in April 2013, one NAPL sample was collected from well MW10-06 for NAPL characterization. This sample was collected on April 25, 2013 and submitted to Maxxam for analysis of BTEX, PHC fractions F1 to F4, PAHs, phenols and creosols. Results of the NAPL characterization are presented in Table 10.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

To ensure that the sampling and analytical data were interpretable, meaningful and reproducible, Golder staff followed a program-specific quality assurance (QA) / quality control (QC) protocol. This involved adhering to QA/QC measures in both the collection (field program) and analysis (laboratory) of samples. The following discussion provides a summary of the QA/QC measures implemented by Golder during the field program and the results of the QC testing.

5.1 Field Sampling QC Measures

Quality Control measures used in the collection, preservation and shipment of samples included the following:

- Sampling methods were consistent with established Golder protocols and provincial/federal requirements;
- Field notes were recorded during all stages of the investigation;
- Sample depths were measured in the field and recorded in field notes;
- Newly installed monitoring well locations were surveyed by Golder field staff using a calibrated GPS unit;
- Soil samples were obtained using clean stainless steel sampling cores. To minimize the potential for cross-contamination of samples, all equipment was washed with laboratory grade detergent between each sampling event and rinsed with distilled water. Field staff wore disposable nitrile gloves to minimize the potential for cross-contamination of samples;
- Groundwater samples were collected using dedicated tubing and bailers;

- Chain-of-custody procedures were followed during sampling events. Copies of the chain-of-custody forms are provided in Appendix B;
- Samples were given a unique sample control number (SCN), which were used for identification. Samples were submitted to the laboratory under chain-of-custody protocols using forms that did not identify the sampling locations, expected concentrations, or QA/QC samples, such as field duplicate samples; and
- The groundwater samples were stored on ice in coolers prior to submission to the analytical laboratory; appropriately completed chain-of-custody forms accompanied the submissions and the samples were received at the laboratory at a storage temperature of between 4 to 7°C.

Additional QA/QC measures taken for collection of soil vapour samples were:

- Field instruments were calibrated daily and/or bump-tested;
- New Teflon tubing was used for each sampling event to avoid cross contamination;
- The sampling flow rate and vacuum was checked for each probe (*e.g.*, to check whether there were blockages);
- Tedlar™ bags were used for collecting soil vapour samples for field screening;
- Leak tracer tests were performed as described above;
- The probes were completed with valves, which were shut when the probe was not sampled;
- The flow rates during sorbent tube sampling were measured and sampling durations were accurately recorded;
- All sampling materials were stored away from potential sources of contamination;
- Sorbent tubes were transported to CARO in a chilled cooler; and
- The vacuums in the canisters were measured using a vacuum gauge that was part of the regulator supplied by TestAmerica;

The vacuums in the canisters were measured before and after sampling in the field, and by the laboratory upon receipt by the laboratory. The vacuum measurements in the nine canisters were as follows:

- Field measurements prior to sampling: 24 to 30 inches Hg; and
- Field measurements after sampling: 2 to 10 inches Hg.

At sea level, a complete vacuum is 29.9 inches Hg. At higher elevations, the measured vacuum will decrease on the order of 1 inch Hg per 1,000 feet elevation gain. Based on the elevation of Calgary, for a complete vacuum approximately 27 inches would be measured. Vacuums prior to sampling of 24 to 30 inches Hg are considered acceptable.

5.2 Groundwater Field QC Tests

Groundwater field QC test samples were used to assess the reliability of field sampling procedures, and consisted of analysis of field duplicates to evaluate the reproducibility or precision of the sampling methodology, and analysis. The results of groundwater duplicate analyses are provided in Table 9 while copies of the Laboratory Certificates of Analysis are provided in Appendix B.

The measure of the reproducibility or precision of the data is quantified by calculating the Relative Percent Difference (RPD) of duplicate sample concentrations. The RPD is calculated as follows:

$$(\text{absolute}\left(\frac{\text{x1} - \text{x2}}{\text{average (x1, x2)}}\right)) \times 100$$

Where: x1 is the original sample result and;

x2 is the blind field duplicate result.

Variability in field duplicate concentrations is caused by small scale heterogeneity in the sample matrix, variability in field sample collection and handling, and variability in laboratory sample preparation and analysis. As sample concentrations decrease and approach the detection limit, the precision generally decreases. For duplicate concentrations that were greater than five times the reporting limit (RL), the RPD quality objective was 30%. When the concentrations were less than five times the RL, RPDs were not calculated. RPD values greater than the above objectives suggest variability has been introduced through the sample matrix, collection, sampling handling, and/or sample analysis.

The RPD quality objectives for the duplicate analyses were met for the BTEX and VOC parameters and a majority of the PAH parameters. The analysis of groundwater from MW11-06 indicated the RPD objective was exceeded for ten PAH compounds, as follows: anthracene – 35% (RPD), benzo(a)anthracene – 39%, benzo(a)pyrene – 42%, benzo[b,j]fluoranthene – 43%, Chrysene – 60%, fluoranthene – 41%, fluorene – 36%, naphthalene – 31%, phenanthrene – 36%, and pyrene – 40%.

To further investigate the raised RPDs, the sampling methodology was reviewed. The samples were collected in accordance with Golder standard field procedures, were submitted in appropriate laboratory-supplied bottles, and were analyzed within the specified hold times. Golder reviewed Maxxam's QA/QC report, and while one surrogate parameter was above laboratory control limits, the overall quality control for the analysis was within acceptable criteria (see Section 5.3).

Based on this information, there may be slightly greater uncertainty associated with groundwater quality data for the above analytes and as such, analytical results that are close to regulatory limits should be interpreted with caution. However, the conclusions of the report are considered unaffected by the quality control results.

5.3 Groundwater Laboratory QC Tests

Maxxam analyzed groundwater samples for this investigation. Maxxam is certified by the Canadian Association for Laboratory Accreditation Inc. (CALA) for the analytical methods used for this program. Internal quality control data provided by Maxxam (Appendix B) were reviewed with the goal of determining whether internal laboratory data quality objectives were generally met with respect to the following QC tests:

- Samples analyzed within holding times;
- Laboratory duplicates or replicates;
- Method blanks, which should indicate concentrations below the detection limits for the specific analyses;
- Analysis of reference samples, including standard reference materials, spikes and/or control samples; and
- Reported concentrations should not exceed the instrument calibration range.

The laboratory method blank analysis results were used to detect interferences or impurities introduced by the laboratory equipment, reagents, or solvents. Surrogate recovery is used for organics by spiking samples with known quantities of surrogate chemicals which have similar chemical properties to the parameters being analyzed. The reported recovery provides an indication of the analytical method accuracy for that sample. Matrix spikes were conducted by adding known concentrations of the analyte of interest to a sample to evaluate the effects of the sample matrix on the analytical method. The analysis of selected samples in duplicate is used to evaluate the reproducibility of the analytical method.

The results of the laboratory QA/QC report for the groundwater analysis indicated the matrix spike, spiked blank and method blank results were above the quality control limits for the surrogate D12-benzo(a)pyrene with values of 140%, 134% and 136%, respectively. These values were outside of the lab quality control range of 50 to 130%. All other spike recoveries, blank concentrations and RPDs were within the laboratory's quality control limits.

The laboratory was contacted in relation to the surrogate exceedances. CALA laboratories are allowed to have one of the four surrogates fall outside of the quality assurance limits provided that the failure is within 10% of the upper and lower limits. As the reported D12-benzo(a)pyrene values are within 10% of the lab quality limits, the analysis meets CALA criteria and is considered acceptable for the purposes of this investigation program.

5.4 Soil Vapour Field QC Tests

Soil vapour QC tests samples are used to assess the reliability of field sampling procedures, and consisted of analysis of sorbent tubes in-series and in duplicate as well as one set of duplicate Summa canister samples to evaluate the reproducibility or precision of the sampling methodology. The results of the soil vapour duplicate analyses and tubes in-series are provided in Table 4 while copies of the Laboratory Certificates of Analysis are provided in Appendix B.

5.4.1 Methods

Sorbent tubes in-series and duplicate samples were collected using sampling flow rates ranging from 150 to 232 ml/min (the actual flow rate was recorded for each sample location). The sorbent tube duplicate samples were collected using a laboratory provided Y-splitter. The Summa canister duplicate was collected using a laboratory supplied splitter and flow regulator. All samples were submitted blind to CARO and/or Test America for analysis.

As described earlier, the measure of the reproducibility or precision of the data is quantified by calculating the RPD of duplicate sample concentrations. Where the concentration of a given parameter was less than five times the analytical method detection limit (MDL) or reporting limit (RL), the results are less precise and a RPD was not calculated. For parameters with concentrations less than five times the MDL or RL, the difference factor

(DF) was calculated, which is the absolute difference between the two sample concentrations. For soil vapour duplicate samples, the target RPD is less than 50 percent (%) and the target DF is less than 2. A RPD greater than 50% for soil vapour is not uncommon and may reflect a combination of sampling variability, which could include variability in sampling flow rates between the two samples, variable sorption to sampling materials, analytical variability, and other factors.

For soil vapour samples collected in-series, a percent ratio is calculated by dividing the concentration in the second tube by the concentration in the first tube. The threshold for breakthrough is typically considered to range from 10% to 25% and for the purposes of this report, the in-series percent ratio target is less than 25%.

5.4.2 Tubes in Series

5.4.2.1 Results

The analysis of the in-series tube data reveals that breakthrough of analytes occurred as indicated by ratios greater than 25% in the three QA/QC samples. Constituents with detections in the second tube included hydrocarbon fractions, 1,2,4-trimethylbenzene, benzene, ethylbenzene, naphthalene, n-decane and xylenes.

For individual constituents, the calculated percent ratios of the in-series samples ranged from 44% to 130%. However, most analyte concentrations were below the analytical reporting limit and when detected, the concentrations were low (less than 6.2 ug/m^3) and in almost all cases within 10 times the reporting limit. The accuracy of soil vapour analyses near the detection limit is reduced and therefore the calculated percent ratios may be uncertain.

For hydrocarbon fractions, the percent ratios could only be calculated for multiple fractions in the one sample (2013 sample from MW10-16A) where elevated hydrocarbon fraction concentrations of up to 2,200 ug/m^3 were measured. For these in-series tubes, the ratios were between 69% and 76%.

5.4.2.2 Discussion

The sample volumes (approximately 3L) employed for the tube analyses were recommended by the laboratory. The measured concentrations in tubes in series were relatively low and therefore saturation would not be expected to affect chemical retention in the sorbent.

The November 2012 tube samples from MW10-16A and MW10-22 were collected at average flow rates of 225 and 232 ml/min, respectively, while the 2013 MW10-16A sample was collected at 150 ml/min. The recommended sampling rate for sorbent tubes is 100 to 200 ml/min. A sampling rate greater than 200 ml/min could potentially result in sorption rate limitations or insufficient time for sorption to occur in the initial tube leading to detection of analytes in the second tube. However, given that the rate was only slightly greater than 200 ml/min, rate limitations are not considered to have likely significantly affected the sorptive capacity of the tubes. In addition, the results for the 2013 MW10-16A sample collected at 150 ml/min indicated similar results to the other two samples with ratios that were greater than 25% for several constituents.

A relatively good comparison was obtained between the Summa canister and sorbent tube results for the February 2011 and April 2013 monitoring events. In contrast, the November 2012 sorbent tube results may be biased low based on comparison to the canister results. This analysis indicates that for February 2011 and April 2013 sampling events, the possible effect of reduced chemical retention on the sorbent was limited and within the range of sampling and analytical variability due to the other factors. The November 2012 comparison indicates the potential for a low bias in the sorbent tube analyses. The reason for possible poor chemical retention in the sorbent tubes is not known.

5.4.3 Duplicate Samples

Two sets of duplicate sorbent tube samples were collected in November 2012 and one set of duplicate Summa samples were collected in April 2013. The results of this analysis are presented in Table 4. As indicated above, the target RPD and difference factor for the duplicate samples is 50% and 2, respectively. The Summa canister duplicate sample from 2013 met all of the quality control targets for this program. The sorbent tubes collected in November 2012 each had exceedances of the quality control thresholds. MW11-04 did not have RPD exceedances but had DF values of 5.6 for hydrocarbon fraction nC6-nC8, 5.8 for toluene and 3.1 for trichlorofluoromethane. Duplicates of MW11-09 had two RPD exceedances at 52% for dichlorodifluoromethane and 74% for trichlorofluoromethane. MW11-09 also exceeded the DF target with values of 5.1 for hydrocarbon fraction nC6-nC8 and 5.2 for toluene. The RPD and RF targets were met for most individual constituents of concern including BTEX (excluding toluene) and naphthalene.

A RPD greater than 50% for soil vapour is not uncommon and may reflect a combination of sampling variability, which could include variability in sampling flow rates between the two samples, variable sorption to sampling materials, analytical variability, and other factors.

5.4.4 Summary

The analysis of the in-series tube data reveals possible breakthrough of analytes as indicated by ratios greater 25% between concentrations in the first and second sorbent tube. However, individual concentrations where there were detections in the second tube were relatively low and generally within 10 times the laboratory reporting limit, and close to background concentrations in indoor air (low $\mu g/m^3$ concentrations). The results indicate a potential concern with respect to analyses of hydrocarbon fractions and that the results may be biased low because of reduced retention. There were RPD and DF exceedances of the QC thresholds in the duplicate samples, but most of these exceedances were relatively low. The results suggest increased uncertainty in sorbent tube results particularly for the November 2012 results. Soil vapour results close to the regulatory limits should be interpreted with caution. Overall, the conclusions of the report are considered unaffected by the quality control results.

5.5 Soil Vapour Laboratory QC Tests

CARO and TestAmerica analyzed samples for this investigation. CARO is certified by CALA and TestAmerica is certified by the National Environmental Laboratory Accreditation Program (NELAP) for the analytical methods used for this program. Internal quality control data provided by CARO and TestAmerica (Appendix B) were reviewed with the goal of determining whether internal laboratory data quality objectives were generally met with respect to the following QC tests:

- Samples analyzed within holding times;
- Laboratory duplicates or replicates;
- Method blanks, which should indicate concentrations below the detection limits for the specific analyses;
- Analysis of reference samples, including standard reference materials, surrogates, spikes and/or control samples; and
- Reported concentrations should not exceed the instrument calibration range.

The analytical reports by CARO (Appendix B) indicate that concentrations in method blanks were generally below the reporting limit (RL). Detections of analytes above the RL in the blank samples is considered acceptable based on the satisfactory performance of other batch quality control.

The results of laboratory duplicate analysis were in almost all cases within the laboratory quality control limit of 30% to 40%. The duplicate analysis is considered acceptable based on the suitable performance of other batch quality control. The results of the analysis on laboratory control samples (LCS) indicate recoveries in most cases were within the laboratory quality control limits (typically 70% to 130%), and when outside these limits were typically only marginally so.

The analytical report by TestAmerica indicates that there were detections of several compounds in the method blanks analyzed, which included trichlorobenzene (0.88 $\mu g/m^3$) and naphthalene (0.95 $\mu g/m^3$) indicating uncertainty in the results at low concentrations. However, given the low concentrations measured and for the purposes of soil vapour analysis, these concentrations do not affect the conclusions of the study. The results of analysis of LCS and calibration check samples indicate recoveries were in almost all cases within the laboratory quality control limits (typically 70% to 130% or 50% to 150% depending on the compound). The results of laboratory duplicate analysis were in almost all cases within the laboratory quality control limit of 25% with the exception of one naphthalene sample that had a marginal exceedance of the RPD limit with a value of 27%.

From the information provided in the QA/QC analyses from the laboratories, the precision and accuracy of the lab data is considered acceptable for the purposes of this investigation program.

6.0 RESULTS

6.1 Physical Characteristics of the Site

6.1.1 Site Stratigraphy

The shallow soil stratigraphy at the Site was generally comprised of the following units in sequence from the ground surface:

- Topsoil, underlain by
- Sandy silt to silty sand, underlain by
- Sand and gravel to sand, with occasional sandy silt interbeds, underlain by
- Siltstone bedrock.

There tends to be a greater thickness of the finer-grained sandy silt to silty sand unit in the central area of the Site (near boreholes MW10-09A/B, MW10-22 and MW10-20). During the 2010 drilling, siltstone bedrock was encountered in three boreholes at depths of 3.7 m bgs (MW10-7A), 3.9 m bgs (MW10-7B), and 6.5 m bgs (MW10-3A). During the most recent drilling in 2011, five boreholes were advanced with the intent of determining the depth to bedrock surface. The depth to siltstone bedrock was determined to be 4.9 m bgs (MW11-01A), 6.4 m bgs (MW11-03A), 5.2 m bgs (MW11-04A), 4.3 m bgs (MW11-06) and 7.0 m bgs (MW11-07). Borehole logs from a previous investigation at the CBC property indicate that depth to bedrock in this area ranges from 7.0 to 9.2 m bgs. Depth to bedrock and bedrock elevations are presented in Table 11.

The depth to the bedrock surface is shown on Figure 4 and indicates that bedrock is present at a depth range of 3.7 to 9.2 m bgs across the Site. Bedrock elevations range from 1046.6 meters above sea level (masl) in MW11-06 to 1040.9 masl in MW4B. This is consistent with the observation that the soil-bedrock interface is lower in the eastern portion of the Site. Details of the soil conditions encountered in each of the newly installed boreholes are presented in the borehole logs included in Appendix A.

6.1.2 Soil Sample Headspace Concentrations and Observations

Soil sample headspace concentrations are included on the borehole logs in Appendix A (only 2012 locations; see 2011 HHRA for previous boreholes). The headspace and visual/olfactory indications are summarized below for the 2012 program.

The headspace concentrations measured during drilling using a PID ranged from 0.4 to 102 ppm. Based on a qualitative comparison, there was a correlation between organic vapour (PID) concentrations and creosote odours and/or staining. The highest PID reading (102 ppm) was recorded from the soil at 6.1 to 6.7 m in MW11-06.

Black staining with an associated creosote-like odour was noted at the following borehole location:

- MW11-06 (6.1 to 6.7 m).

A creosote-like odour was encountered at the following borehole locations:

- MW11-03A (5.5 to 8.5 m); and,
- MW11-06 (6.1 to 7.9 m).

6.1.3 Site Hydrogeology

The Site topography is relatively flat and there are no nearby upland areas. The nearest surface water body is the Bow River located approximately 45 m south of the Site.

Groundwater elevation data are summarized in Table 5. The depth to groundwater was between 2.651 and 4.468 m bgs on October 30, 2012. The groundwater (potentiometric) elevations are shown on Figure 5 (February 2011) and Figure 6 (October 2012). The inferred groundwater elevation contours and groundwater flow direction for February 2011 is shown on Figure 5, but is not shown for October 2012 because of the greater uncertainty in the data. Upward vertical hydraulic gradients of up to approximately 0.1 m/m were measured at shallow/deep well clusters at MW-7A/B and MW-3A/B, while downward hydraulic gradients were measured at MW-9A/B.

The groundwater elevations for February 2011 indicate that west of 17th Street NW, the shallow groundwater flow direction is towards the north. This suggests water from the Bow River is moving onto the Site. East of 17th Street NW, the shallow groundwater flow direction appears to be toward the south to southeast although there are a limited number of wells in this area. The apparent change in groundwater flow direction is unusual although a possible cause may be the transition from coarser-grained soil deposits above the bedrock in the western area of the Site to the finer-grained soil deposits observed in the area of 17th Street SE and at the CBC site, which may act to limit inflow from the Bow River in this area. Another possible cause, although there was no visual evidence, could be a change in the river stage adjacent to the Site, which could affect losses of water north of the river. Groundwater flow directions may also locally be affected by buried utilities and infrastructure.

Groundwater pumping could also affect the groundwater flow direction although there is no indication that pumping is occurring in the immediate area of the Site.

The groundwater elevation data for October 2012 is more variable than for February 2011. There appears to be a component of groundwater flow to the north, east of 17th Street NW, although elevations along Broadview Road do not indicate a consistent groundwater flow direction. The groundwater elevations were lower in October 2012 compared to February 2011, and as a consequence, the variable bedrock surface and utility corridor backfill may have affected the groundwater flow direction. The storm sewer below Broadview Road is a large, deep utility and therefore may act as a sink for groundwater flow when the water table is low.

In December, 2011, leveloggers were installed in monitoring wells MW10-2, MW10-15 and MW10-18, just above the bottom of each well. A Solinst barologer was also installed in monitoring well MW10-2 to enable atmospheric pressure compensation of the data. Golder personnel have periodically returned to the Site since installation to download the data and manually measure the groundwater depth using an interface probe in order to calibrate the transducers. Data from the transducers is presented in Figures 7, 8 and 9 below. Note that intermittent data is missing due to equipment malfunction or the wells being inaccessible.

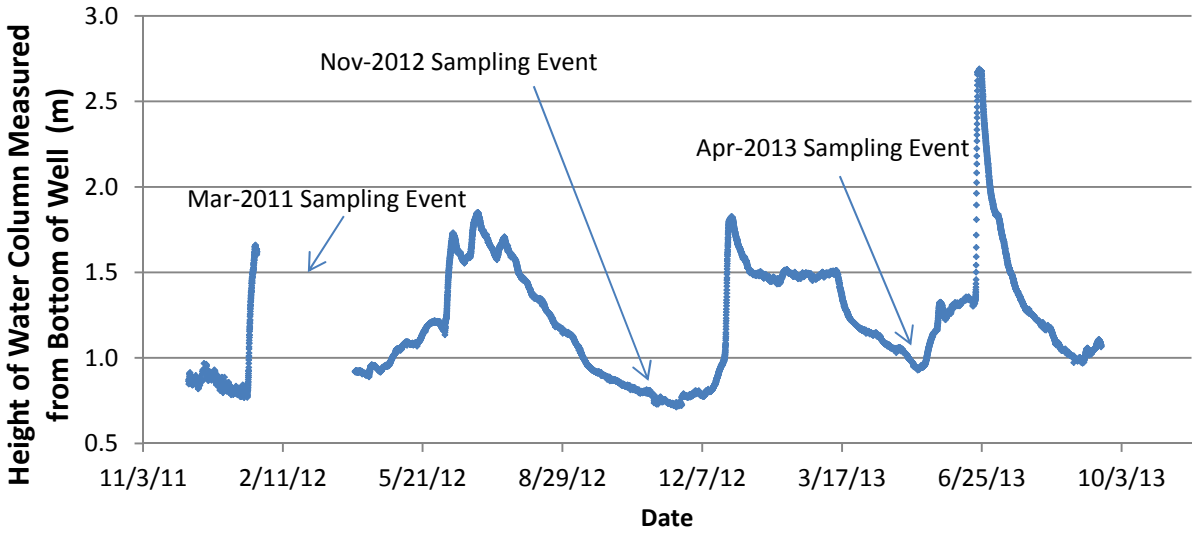

Figure 7: Height of Water Column in Monitoring Well MW10-02 - Dec 2011 to Sept 2013

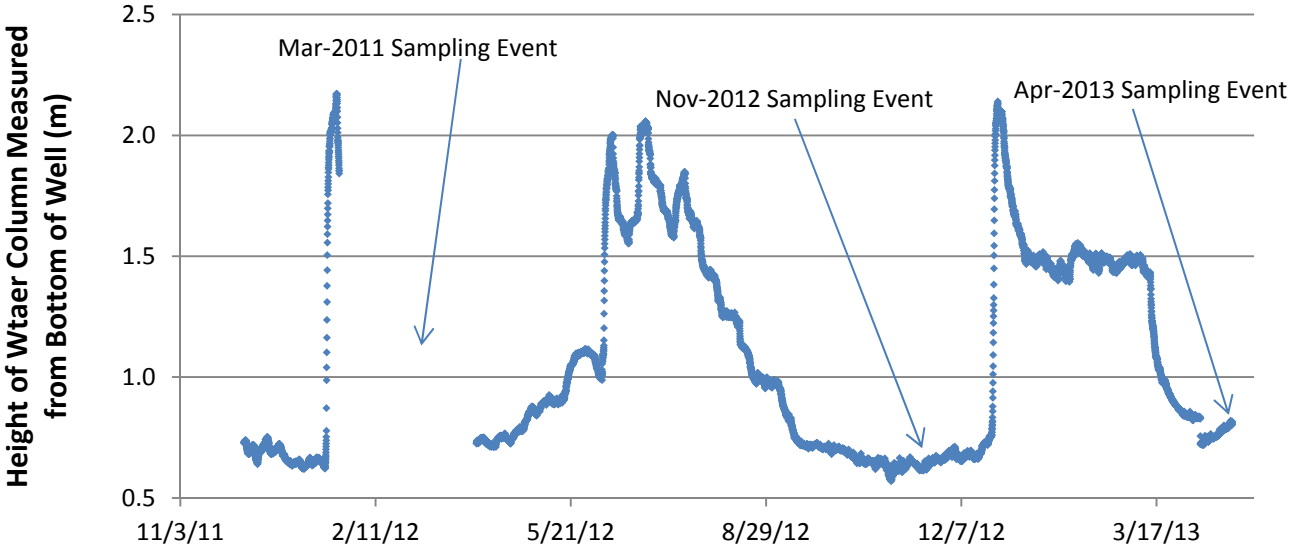

Figure 8: Height of Water Column in Monitoring Well MW10-15 - Dec 2011 to May 2013

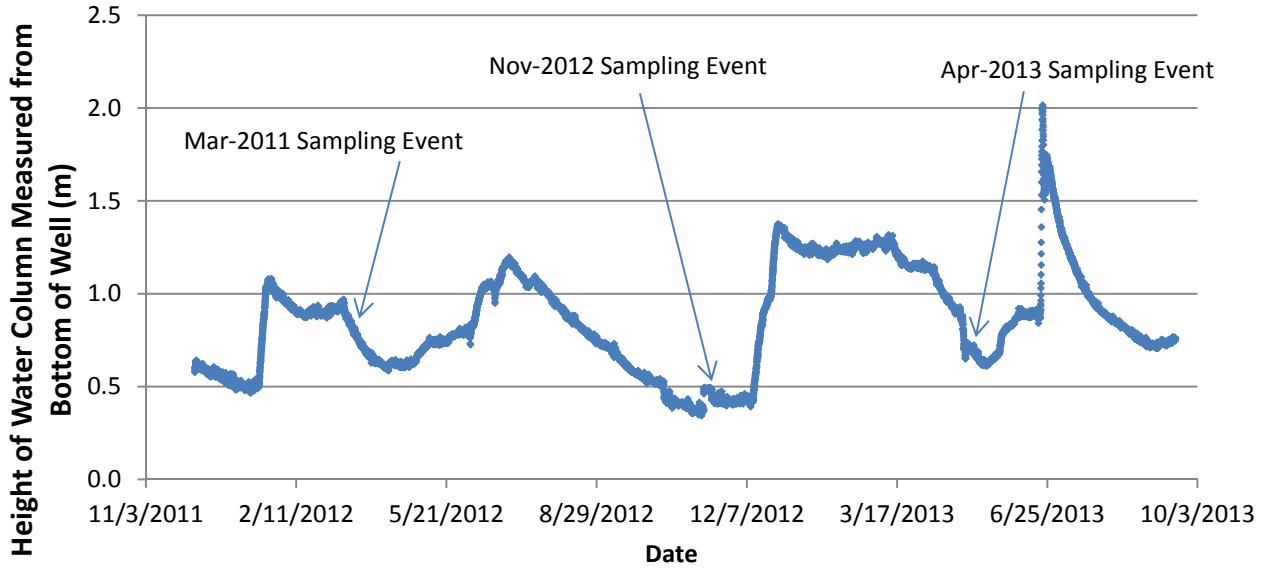

Figure 9: Height of Water Column in Monitoring Well MW10-18 - Dec 2011 to Sept 2013

The transducer data shows similar trends in all three of the monitored wells. The groundwater table is generally highest during the summer months (June and July) and then again in late December and in January. The increase in late December and in January is thought to coincide with ice dams forming in the Bow River while the increase in June and July is thought to be from the higher Bow River water level during freshet and precipitation during the summer months. Note the dramatic increase in groundwater table elevation noted in June 2013 caused by flooding of the Bow River.

The initial groundwater and soil vapour sampling was conducted in November 2012 as groundwater was expected to be lowest during the period prior to the ice dams forming in the Bow River. When it was decided that a confirmatory re-sampling event was necessary, the transducer data was reviewed to determine when to conduct the sampling event. The re-sampling was conducted in April 2013 as the groundwater levels were similar to those observed in November 2012.

6.2 Analytical Results

6.2.1 Soil Analyses

In 2011, four samples were submitted for grain size analysis. Three of the four samples were classified as fine-grained soil and one sample was classified as coarse-grained soil. However, based on visual observation, the majority of the unsaturated soil was inferred to be coarse-grained. Visual observations from the 2012 drilling confirm the general coarse-grained nature of the soils on-Site.

6.2.2 Groundwater Analyses

The field-measured parameters are presented in Table 5. The groundwater analytical results are presented in Tables 7 and 8. Results from the NAPL characterization can be found in Table 10. Sample laboratory analytical reports are included in Appendix B.

6.2.2.1 Field Parameters

In November 2012, the groundwater pH values were between 7.25 and 8.50. These values were within the AB Tier 1 Guidelines of 6 to 8.5. The electrical conductivity values ranged from 489 µS/cm to 1,699 µS/cm (Micro Siemens per centimetre). Dissolved oxygen ranged between 1.56 mg/L and 8.59 mg/L.

During groundwater sampling, a strong creosote-like odour was noted in wells MW10-7A and MW1. A strong creosote-like odour and visible sheen was noted in wells MW11-01A, MW11-06 and MW2B.

The monitoring of wells with an interface probe indicated no NAPL was encountered with the exception of three wells. In November 2012, MW10-6 had approximately 0.57 m of LNAPL present in the well. Well MW3-A on the CBC property had 4.5 m of DNAPL and well MW6-B, also on the CBC property, had 0.72 m of DNAPL. The NAPL is noted as being black and having a strong creosote-like odour.

During the previous sampling event in February 2011, 0.001 m of LNAPL was noted in well MW10-6, but as noted above, 0.57 m was measured during the November 2012 event. In April 2013, NAPL sampling at MW10-6 was conducted for the purpose of compositional analysis. However, at this time, MW10-6 had 0.44 m of DNAPL present in the well, but no LNAPL was detected. The different occurrences of NAPL in well MW10-6 indicate the density of NAPL is close to that of water (i.e., neutrally buoyant). The reason for the differences observed is not known but may be due fluctuations in groundwater elevation, different ways in which the well was probed or sampled, which may itself have caused changes in the NAPL phase, or possibly seasonal differences in temperature. As temperature increases, NAPL density would be expected to decrease, and groundwater temperatures measured in November 2012 were higher than in April 2013. The occurrence of LNAPL in February 2011 does not fit this hypothesis, but only a thin skim was detected during this event.

During groundwater monitoring, an initial screening of well headspace concentrations was conducted, with results presented in Table 2. The headspace readings were measured using a RKI Eagle 2 with a PID and combustible gas detector. The organic vapour concentrations as measuring using the PID ranged from 0 ppm to 96 ppm with the highest concentration measured in well MW3-B on the CBC property. Combustible gas

concentrations (platinum sensor) ranged from 0 to 155 ppm with the highest concentration measured in MW10-6.

Additional field testing of soil vapour was conducted between November 2 to 8, 2012 and in select wells on April 24 to 25, 2013 with results presented in Tables 1 and 2. The sequential purge data generally indicated either relatively consistent concentrations or a slight decline in concentrations during purging. The soil vapour concentrations at the end of the purging process (Table 1) are summarized as follows:

- The minimum oxygen concentration was 12.7% (MW10-22);
- The maximum carbon dioxide concentration was 7.5% (MW10-22);
- The maximum organic vapour (PID) concentration was 34 ppm (MW10-6), which increased to 71 ppm during the subsequent April 2013 event; and
- The maximum combustible gas concentration was 155 ppm (MW10-6).

Overall, the results indicate a well oxygenated vadose zone, with relatively low organic vapour and combustible gas concentrations. Oxygen was somewhat depleted at some locations, and carbon dioxide concentrations were elevated, indicating aerobic biodegradation of creosote related compounds or naturally occurring organics is occurring.

6.2.2.2 Dissolved Petroleum Hydrocarbons

The results of dissolved petroleum hydrocarbon analyses are presented in Table 8. Concentrations of PHC Fractions F1 and F2 in groundwater are presented on Figure 10. Concentrations of xylenes in groundwater are presented on Figure 11. Analytical results indicated that the concentrations of benzene, ethylbenzene and PHC fraction F2 in MW10-7A were above the most stringent AB Tier 1 Guidelines, which is consistent with the 2011 sampling event. Newly installed wells MW11-01A, MW11-06 (and its duplicate) and CBC well MW2B had concentrations of benzene, toluene, ethylbenzene, xylenes and PHC Fraction F2 above the most stringent AB Tier 1 Guidelines. Groundwater from MW11-06 and its duplicate had the highest concentrations of benzene, toluene, ethylbenzene, xylenes and PHC Fraction F2 with concentrations of 0.86, 2.2, 0.59, 2.5 and 30 mg/L, respectively. The Alberta Tier 1 guidelines for benzene, toluene, ethylbenzene, xylenes and PHC Fraction F2 are 0.005, 0.024, 0.0024, 0.3 and 1.1 mg/L, respectively.

When compared to the AB Tier 2 Guidelines for the inhalation pathway, the benzene concentration exceeds in MW11-06 and its' duplicate. The F2 groundwater concentration exceeded the AB Tier 2 inhalation Guideline at wells MW10-7A, MW11-01A, MW11-06 and its duplicate, MW1A and MW2B.

All other wells sampled during the 2012 event were below laboratory detection limit for all hydrocarbon parameters and below the most stringent AB Tier 1 Guidelines.

6.2.2.3 PAHs

The results for PAHs are presented in Table 7. Concentrations of naphthalene in groundwater are presented on Figure 12. The individual PAH compound with the highest concentration was naphthalene (15 mg/L in well MW11-06) followed by phenanthrene (1.8 mg/L in well MW11-01A). The highest PAH concentrations were measured at MW10-7A, MW11-01A, MW11-06, MW1A and MW2B.

The results of the PAH analysis indicate all but one well had at least one PAH compound concentration that exceeded the most stringent AB Tier 1 Guidelines. The only well without any exceedances for PAHs was well MW2A on the CBC property.

The analytes with the most frequent exceedances of the most stringent AB Tier 1 Guidelines were anthracene, B(a)P equivalency, benzo(a)anthracene, benzo(a)pyrene, fluoranthene, naphthalene, phenanthrene and pyrene.

When compared to AB Tier 2 Guidelines for the inhalation pathway, naphthalene concentrations in wells MW10-7A, MW11-01A, MW11-06, MW1A and MW2B exceeded the guideline of 0.6 mg/L. 2-methylnaphthalene was also compared to the Tier 2 naphthalene guideline and wells MW11-01A, MW11-06 (and its duplicate) and MW2B exceeded the guideline of 0.6 mg/L.

6.2.2.4 VOCs

The results for VOCs are presented in Table 8. The only VOC parameter that exceeded the AB Tier 1 Guideline (0.072 mg/L) was styrene at well MW11-06 and its' duplicate with a concentration of 0.22 mg/L. During the 2012 sampling event, no parameters exceeded the AB Tier 2 Guidelines for the inhalation pathway.

Two wells (MW10-1 and MW10-7A) were sampled in the previous 2011 event and the most recent 2012 event. In 2011, marginal chloroform exceedances of the Tier 2 inhalation Guidelines were noted in these two wells. During the 2012 event, both MW10-1 and MW10-7A were non-detect for chloroform concentrations in groundwater.

6.2.2.5 NAPL Characterization

The results for NAPL characterization for well MW10-6 are presented in Table 10. The NAPL in MW10-6 was detected as an LNAPL sheen in February 2011, 57 cm of LNAPL in October 2012, and 44 cm of DNAPL in April 2013. Results of the NAPL characterization indicate that the NAPL consists mainly of PHC Fraction F2 (3600 mg/L), PHC Fraction F3 (3400 mg/L), PHC Fraction F4 (510 mg/L) and naphthalene (200 mg/L). Relatively low concentrations of BTEX and PHC Fraction F1 (8.8 mg/L) were detected. No phenols were detected; however, because of the high concentrations for other parameters, the detection limits were raised. All PAHs analyzed were detected with the exception of acridine, benzo(a)anthracene and quinolone.

The chromatogram of the NAPL sample analysis from MW10-6 is shown in Appendix B. The NAPL chromatograph was compared to Maxxam Analytics reference library of chromatograms obtained from GC/FID analyses of different products (e.g., fuels) or chemical mixtures. No reference chromatographs were available for creosote as the components in creosote are quite variable. However, Maxxam provided two example chromatographs from other creosote impacted sites for comparison. The PHC Fraction F2 – F4 chromatogram for the NAPL sample was not consistent with any of the reference chromatographs it was compared against and was not consistent with the two example creosote chromatographs. However, creosote cannot be ruled out based on this information as creosote profiles can vary significantly. The presence of elevated PAH compounds (in particular naphthalene) in the NAPL sample from MW10-6, and a PHC fingerprint extending through F2, F3 and F4 is an indication of creosote presence.

6.2.3 Soil Vapour Analyses

The soil vapour samples were tested for a wide range of volatile compounds by both CARO and TestAmerica (with some overlap). The TO-15 analysis by TestAmerica was for the PIANO (paraffins, isoparaffins, aromatics, naphthenes, and olefins) list of compounds. The results of analysis for a subset of compounds commonly associated with creosote, which are BTEX, F1, F2 and naphthalene, are presented in Table 3.

Based on an initial review of soil vapour results from the November 2012 sampling program, it was determined that there was value in re-sampling a number of soil vapour probes in order to confirm the November 2012 results. One result in particular, collected from MW10-6 in November 2012, showed higher BTEX and naphthalene concentrations in the Summa canister than determined from the sorbent tube sample collected from this same location. Furthermore, the Summa results at this location were substantially elevated from the previous 2011 results, whereas this increase was not observed at other locations at which Summa samples were tested in 2012. The results of the April 2013 re-sample are also found in Table 3, and indicated higher concentrations again compared to previous monitoring events, but comparable Summa canister and sorbent tube results.

During the November 2012 sampling event, the maximum benzene, ethylbenzene, xylenes and toluene concentrations in soil vapour were 7.6 $\mu g/m^3$ for benzene (VP11-03B deep probe), 24 $\mu g/m^3$ for ethylbenzene (MW10-6 well), and 187 $\mu g/m^3$ for xylenes (MW10-6 well), and 702 $\mu g/m^3$ for toluene(VP11-09 shallow probe) (maximum of sorbent tube and Summa canister results). The maximum F1 and F2 concentrations in soil vapour were 1,400 $\mu g/m^3$ (MW11-03B deep probe) and 1,300 $\mu g/m^3$ (MW10-6 well), respectively. The maximum naphthalene concentration in soil vapour was 190 $\mu g/m^3$ (MW10-6 well). The highest BTEX and PHC F1 and F2 concentrations were encountered at MW10-3B well, MW10-6 well, MW10-11 (well), MW11-03B shallow and deep probes, VP11-08 and VP11-09.

During the April 2013 sampling event, the maximum benzene, ethylbenzene, toluene and xylenes concentrations in soil vapour were 1.2 $\mu g/m^3$, 8,600 $\mu g/m^3$, 1,040 $\mu g/m^3$ and 33,000 $\mu g/m^3$, respectively, all from MW10-6 well. The maximum F1 and F2 concentrations in soil vapour were 180,000 $\mu g/m^3$ and 310,000 $\mu g/m^3$, respectively, again from the MW10-6 well. The maximum naphthalene concentration in soil vapour was 32,000 $\mu g/m^3$ (MW10-6 well). The highest BTEX and PHC F1 and F2 concentrations encountered in April 2013 were at the MW10-6 well.

The results of the complete CARO and TestAmerica analysis are presented in Appendix C. Generally, the large majority of the VOC analytes were either non-detect or measured at low concentrations, below 100 $\mu g/m^3$. The exception to the low VOC detections is well MW10-6. Concentrations of multiple analytes in MW10-6 exceeded 1,000 $\mu g/m^3$.

The sorbent tube soil vapour concentration results from November 2012 were lower than the available 2011 data especially with respect to PHC. PHC F1 and F2 in November 2012 were typically non-detect where at the same locations in February 2011 elevated concentrations were measured. In contrast, the 2012 sorbent tube concentrations were greater than 2011 tube results. The April 2013 sorbent tube concentrations depending on location were greater or less than concentrations measured in 2012. The largest difference was observed at MW10-6 where BTEX and naphthalene concentrations were over two times higher in April 2013 compared to November 2012. The results indicate significant temporal variability at this location despite similar groundwater elevations.

A comparison of the Summa canister TO-15 and sorbent tube TO-17 analyses of BTEX and naphthalene at select locations are provided in Figure 13. A relatively good comparison was obtained for the February 2011 and April 2013 results (with the exception of one analyte in 2011). In contrast, much lower TO-17 than TO-15 results were obtained in November 2012 suggesting a downward bias in the TO-17 concentrations. The reason for the bias is unknown as sampling methods and procedures were similar for each monitoring event.

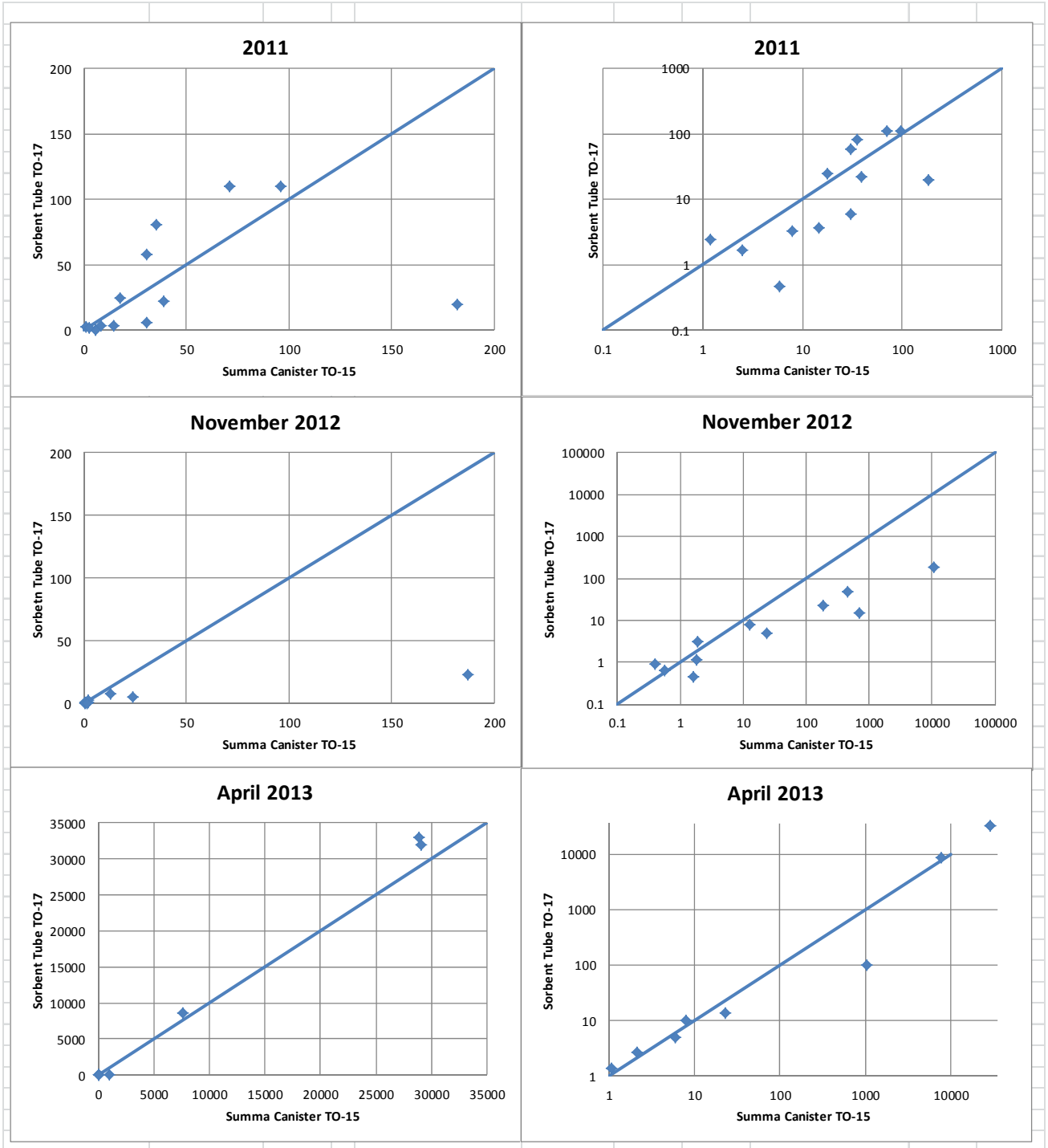

Figure 13. Comparison of 2011, November 2012 and April 2013 Summa Canister TO-15 and Sorbent Tube TO-17 Results for BTEX and Naphthalene (1:1 line shown in blue)

6.3 Discussion

6.3.1.1 Soil

The lithology across the Site at new locations is consistent with the 2011 results. While no analytical testing was conducted on soil samples, visual observations confirmed that the Site is generally underlain by coarse-grained sands and gravels underlain by siltstone bedrock. The depth to bedrock increases from west to east across the Site and ranges from 3.7 m bgs at MW10-07A (west portion of the Site near Broadview Road and 18th Street) to 9.2 m bgs at MW4B (east portion of the Site on the eastern CBC property boundary).

6.3.1.2 Groundwater Quality

As described above, benzene, naphthalene, 2-methylnaphthalene and F2 concentrations in groundwater exceeded the AB Tier 2 Guidelines for the inhalation pathway. The elevated naphthalene and F2 concentrations in groundwater are consistent with a creosote source. The highest PHC and PAH concentrations were measured at MW10-7A, MW11-01A, MW11-06, MW1A and MW2B, which is consistent with historic results at these locations and observations of creosote-like sheens and odours at these monitoring well locations. It should be noted that groundwater from MW10-6 was not sampled during the most recent sampling events due to the presence of NAPL.

Dissolved concentrations of PHC F1 and F2 are depicted spatially on Figure 10; naphthalene concentrations are shown on Figure 11 and xylenes are shown on Figure 12. As seen on Figure 10, the highest concentrations of PHC F1 and F2 were measured at wells along Broadview Road NW between 18th Street NW and 19th Street NW, as well as more isolated impacts around southern well MW11-6 and the western well on the CBC property (MW2B). The trend for naphthalene is similar with the highest concentrations measured at wells MW-7A, MW11-01A, MW11-06 and MW2B. While naphthalene concentrations were much lower outside of these wells, almost all wells had naphthalene detections indicating widespread low concentration impacts at the Site area wells, which is consistent with historic results. The concentration of naphthalene measured in MW11-06 (11 and 15 mg/L) is near to the solubility limit for this compound in water (approximately 31 to 34 mg/L [Dragun 1998]) indicating that DNAPL may be present in the vicinity of this well despite not being detected in the monitoring well. The total xylenes concentrations showed similar spatial pattern to that of PHC F1 and F2 and naphthalene. At well pair MW-7A/B, the BTEX and naphthalene concentrations were approximately 10 to 100 times higher in the deep well (completed in gravel and bedrock) compared to the shallow well (in sand and gravel, and straddling the water table).

Styrene exceeded the AB Tier 1 Guideline in well MW11-06 but was less than the Tier 2 Guideline for drinking water and inhalation pathways. MW11-06 generally had the highest concentrations of creosote-related compounds to which the styrene is most likely related.

Chloroform, which was detected in 2011 above the AB Tier 2 Guideline for the inhalation pathway, was non-detect in all of the 2012 samples. Wells MW10-1 and MW10-7A were sampled for chloroform analysis in both 2011 and 2012. Chloroform above the Tier 2 Guidelines was noted in these wells in 2011 but was non-detect in 2012. In the 2011 HHRA, chloroform was deemed not likely related to the creosote impacts at the Site.

6.3.1.3 Soil Vapour

Soil vapour concentrations are presented spatially on Figures 14, 15 and 16. As indicated earlier in this report, the results from the November 2012 sorbent tubes are likely biased low. Interpretation of the data is more heavily weighted on analysis from the November 2012 Summa canisters and the re-sampling results from the April 2013 tubes and Summa canisters, which also reflect higher concentrations.

Elevated concentrations of PHC F1 and F2 were detected at MW10-7B, MW10-16, MW10-15 and MW11-03A and significantly elevated concentrations of F1 and F2 were noted in MW10-06. These elevated F1 and F2 concentrations are consistent with historical data and known historical NAPL zones. Naphthalene concentrations were elevated at MW10-15, VP11-08 and VP11-09 with significantly higher concentrations (approximately 3 orders of magnitude) measured at MW10-06. Xylenes concentrations were elevated at MW10-15 and VP11-09, and significantly elevated concentrations were measured at MW10-06. The elevated xylenes and naphthalene concentrations are generally consistent with historical results and known historical NAPL impacts across the Site.

The elevated concentration of F1 and F2, xylenes and naphthalene detected in soil vapour from well MW10-06 is likely related to the presence of NAPL at this location and groundwater elevation. In 2011, only 0.001 m of LNAPL was noted in well MW10-06 as opposed to the November 2012 and April 2013 sampling events where 0.57 m of LNAPL and 0.44 m of DNAPL were noted, respectively. The concentrations of compounds such as naphthalene, BTEX, and PHC Fractions F1 and F2 at MW10-06 as measured in April 2013 are the highest ever measured at this location, or anywhere on-Site.

To further evaluate the relationship between groundwater and soil vapour, the measured soil vapour concentration was compared to the soil vapour concentration predicted from the measured groundwater concentration according to the Henry's Law Constant partitioning calculation. The partitioning model assumes equilibrium conditions and no soil vapour concentration attenuation. The results, presented in Table 12, indicate that the measured soil vapour concentrations were significantly lower (generally one to four orders-of-magnitude) than the predicted concentrations. The results are consistent with measurements at other hydrocarbon-impacted sites where significant concentration attenuation is typically observed within the capillary fringe and deep vadose zone due to a relatively slow rate of chemical diffusion through the capillary fringe and aerobic biodegradation.

6.4 Updated Conceptual Site Model

An updated CSM was developed based on the results of the 2011 site investigation/HHRA and this 2013 HHRA Update. Geology at the Site consists mainly of topsoil underlain by sandy silt to silty sand, underlain by varying amounts of sand and gravel. Siltstone bedrock is encountered between 3.7 and 6.5 m bgs and is generally encountered at a higher elevation in the western portion of the Site and at a lower elevation in the eastern portion of the Site. The groundwater elevation data indicates approximately 1.5 m fluctuation seasonally and lower elevations in November and April and higher elevations in late spring and early summer and early winter. West of 17th Avenue, the groundwater flow direction during higher water table conditions appears to be to the north indicating the Bow River in this area is losing water to the shallow groundwater system. During lower water table conditions, the groundwater flow direction is variable and likely controlled by the variable bedrock surface and utility corridor backfill.

There is evidence of creosote impacts in bedrock and soil above bedrock at three monitoring wells along Broadview Road NW (MW10-6, MW10-7B and MW11-01), which is generally consistent with the area with historical indications of NAPL. Well MW10-6 is a short distance further west than historical locations where NAPL was encountered. In 2011, MW10-6 had a creosote-like LNAPL sheen at the water table, whereas in 2012/2013 there was 0.57 m of LNAPL (2012) and 0.44 m of DNAPL (2013) present in the well. Evidence of creosote impacts were also noted at MW11-06 located north of Westmount Blvd near 18th Street, where no historical impacts of NAPL have been noted. Creosote impacts were also noted in wells MW1 and MW2 on the west portion of the CBC property, and MW3-A and MW6-B in the central area of the CBC property (see Appendix A of Golder 2011 HHRA for well locations). These impacts are consistent with historical results.

The results of groundwater analyses indicate elevated concentrations of naphthalene and PHC F2 fraction in wells along Broadview Road NW in the general area of 18th Street NW that were consistent with locations of monitoring wells with observed creosote impacts (MW11-1A, MW10-7A, MW10-6, MW2B). Other Site wells had significantly lower but detectable naphthalene concentrations, excluding MW11-6 where the highest naphthalene concentration was measured. Groundwater concentrations were relatively consistent between the March 2011 and November 2012 sampling events.

The results of soil vapour analyses from November 2012 (March 2011, November 2012 [Summa canisters only] and April 2013) indicated significantly higher BTEX, naphthalene and hydrocarbon fraction concentrations at MW10-6 compared to all other sampling locations. For example, the April 2013 naphthalene concentration in soil vapour at MW10-6 was approximately 700 times higher than the next highest concentration from previous events and the F1 and F2 concentrations were approximately 50 times higher. NAPL was detected in well MW10-6 (LNAPL in 2011 and 2012, and DNAPL in 2013) and therefore the possible presence of NAPL within the vadose zone may be the source of the elevated soil vapour concentrations measured at this location. Excluding MW10-6, the concentrations of analytes commonly associated with creosote, such as BTEX, F1 and F2 were relatively low compared to other sites where higher soil vapour concentrations have been measured near to creosote-impacted soil. In addition, testing of soil vapour for a large list of the PIANO (paraffins, isoparaffins, aromatics, naphthenes, and olefins) compounds did not reveal other compounds of significant potential concern based on qualitative comparisons and the human health risk assessment.

Soil vapour monitoring indicated elevated oxygen concentrations near to atmospheric levels at most locations indicating a well-oxygenated vadose zone, and relatively low carbon dioxide, methane and combustible vapour concentrations. The elevated oxygen concentrations and somewhat elevated carbon dioxide concentrations suggest that aerobic biodegradation is a process that reduces the concentrations of creosote-related vapours to relatively low levels at most locations. The BTEX and naphthalene concentrations were relatively low at the probe (MW10-22) with the lowest oxygen concentration (13%). In contrast, the oxygen concentrations were close to atmospheric at probe MW10-6, where relatively high BTEX and naphthalene concentrations were measured, and where PID concentrations measured during field screening were also elevated (up to 74 ppm). The elevated oxygen concentration at MW10-6 is unexpected, but may be due to a nearby NAPL source that is close to the probe and incomplete biodegradation within short vapour migration distances. During the previous investigation, it was noted that the depth to the water table was sufficiently high such that the NAPL source zones appeared to be submerged in early March 2011, which was consistent with a relatively weak vapour source and low soil vapour concentrations. It was postulated that there would be greater potential for volatilization for low groundwater elevation conditions, particularly if the groundwater was below the surface of the bedrock. Based on data collected from three permanent water level transducers (see Section 6.1.3),

between December 2011 and September 2013, groundwater levels were generally at their lowest from late October to early December and almost as low in March and April. Groundwater levels measured during this period remained above the bedrock surface, with the bedrock surface at MW10-7A (location with the shallowest bedrock) within approximately 0.3 m of the water table during the lowest water table periods.

7.0 SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT

7.1 Overview of the Risk Assessment Process

Risk assessment is the process used to evaluate the likelihood that adverse biological effects may occur or are occurring as the result of exposure to one or more stressors. Risk assessment provides a framework for integrating and presenting scientific data and conclusions about:

- Source of contaminants of potential concern (COPCs; what contaminants are present?);
- Pathways (how do the COPCs exert an adverse influence on receptors?);
- Receptors (which human populations are affected by the COPCs?); and
- Exposure (how much of the COPC does the receptor encounter?).

A risk cannot occur unless a COPC, pathway, receptor occur in the same place at the same time.

The screening level human health risk assessment includes the following components:

- Problem Formulation - The following tasks were conducted as part of the Problem Formulation:
  - Compile and review the data collected to date;
  - Develop a CSM to illustrate site conditions;
  - Conduct data screening to identify COPCs;
  - Identify receptors of potential concern; and
  - Identify potential exposure pathways.
- Data Gap Assessment – The Data Gap Assessment was conducted to identify outstanding data needs for the risk assessment.
- Toxicity Assessment – The Toxicity Assessment involved the selection of regulatory toxicological benchmarks for the COPCs utilizing the hierarchy of regulatory sources provided by AENV.
- Exposure Assessment – The exposure assessment involved the calculation of exposure doses for human receptors for various potential exposure pathways identified in the Problem Formulation (*i.e.,* inhalation of vapours).
- Risk Characterization – The Risk Characterization involved the comparison of the estimated dose (exposure assessment) with the regulatory toxicological benchmark (toxicity assessment), to determine potential for adverse health risks. The Risk Characterization component also included the identification and discussion of the significance of areas of uncertainty (Uncertainty Analysis) and an indication as to how these uncertainties were treated within the risk assessment.

The methods used to complete the HHRA were in accordance with approaches recommended by regulatory agencies such as Alberta Environment (2010a, b) and Health Canada (2010 a and b, and 2009b).

7.2 Problem Formulation

7.2.1 Overview of Problem Formulation

The Problem Formulation is conducted to understand: (1) what potentially harmful substances (*i.e.*, contaminants present at concentrations in excess of generic screening criteria) are present at the site; (2) how human receptors may use the site; and (3) the pathways of contact that are possible between the receptors and these substances. The COPCs, site users and corresponding exposure pathways are examined in detail to identify "reasonably anticipated" exposure pathways that contribute to potential risk.

The following components are typically used to generate a conceptual exposure model:

- Assessment of current and future land use conditions;
- Identification of potential current and future site users;
- Identification of substances located on-site in concentrations that exceed appropriate generic screening levels;
- Identification of the media in which COPCs are located (*i.e.*, soil, groundwater, and air); and
- Identification of routes by which site users may come into contact with COPCs.

After evaluation of the "reasonably anticipated" exposure pathways, it is possible to identify whether scenarios exist that could pose a risk. If a potentially unacceptable risk scenario is identified, then a more detailed examination or quantitative risk assessment of the site is warranted. A more detailed examination of the site involves conducting the remaining quantitative stages of the risk assessment (exposure and toxicity assessments and risk characterization).

7.2.2 Site Use

The Site is primarily a residential area located between 15th Street NW to 19th Street NW (east to west) and between Westmount Blvd. NW and Westmount Road NW (south to north). The Site is developed with single-family homes, streets and alley ways. There are also two churches, two parks, and properties occupied by the CBC Calgary Radio and Television, the Bow Valley Lawn Bowling Club, and Firehall and Emergency Medical Services (EMS) Station #6. The Site is used for residential and commercial purposes. Construction workers could be on-site for relatively short periods of time for construction activities such as utility installation or home construction.

The Site is serviced with municipal water supplied from the City of Calgary. Water supplied to the Site is assumed to be used for domestic and/or office purposes only. Domestic wastewaters generated at the Site are discharged directly to the municipal sanitary sewer system. No process-related wastewaters are expected to be generated by the types of residential, institutional and commercial activities observed on Site.

Storm water flows to overland to grassed areas infiltrating the subsurface or overland into municipal storm water catch basins located in the paved roads running through and adjacent to the Site.

7.2.3 Land Use and Identification of Potential Human Receptors

As discussed in Section 7.2.2, the Site is a residential neighbourhood containing several commercial properties. The land use and activities in the area are not expected to change in the foreseeable future. Based on this information, the following receptors were considered for current/future scenario for this assessment:

- Residential receptors (adults and toddlers); and
- Commercial workers (adults).

7.2.4 Chemicals of Potential Concern (COPCs)

7.2.4.1 Data Set

Although historical data are available for this Site, soil vapour and groundwater data collected in 2011, 2012 and 2013 for the purposes of the risk assessment were utilized as they reflect the most current site conditions. The historic data were reviewed and used to plan the site investigations conducted to support this risk assessment.

7.2.4.2 Screening Criteria

7.2.4.2.1 Soil Vapour

In Alberta, there are currently no remediation guidelines for evaluating the significance of measured soil vapour concentrations (*i.e.*, the AB Tier 1 guidelines are limited to soil and groundwater). In the absence of soil vapour guidelines, site-specific soil vapour screening criteria were developed following the methodology outlined in AB Tier 1 Guideline (AENV 2010a) and the CCME Canada-Wide Standard for Petroleum Hydrocarbon Compounds (CWS-PHC) in Soil User Guidance (January 2008), as follows:

For parameters that are non-carcinogens and have RfC values under AB Tier 1 Guidelines:

$$Csv = \frac{(RfC - Ca)(SAF)(BAF)}{(ET)(AF)}$$

For parameters that are carcinogens and have risk specific concentrations (RsC) under AB Tier 1 Guidelines:

$$Csv = \frac{(RsC)(BAF)}{(ET)(AF)}$$

where:
Csv = site-specific soil vapour screening criteria (µg/m^3)
RfC = reference air concentration (µg/m^3); also referred to as tolerable concentration
RsC = risk specific concentration
Ca = background indoor/outdoor air concentration (µg/m^3)
SAF = soil vapour allocation factor (unitless)

BAF = biodegradation adjustment factor (10, if eligible; 1, if not eligible, assumed to be not eligible for all compounds)
ET = Exposure term (unitless)
AF = attenuation factor between soil vapour and indoor air (unitless)

For SAF and Ca, the values in Table C-9 of the AB Tier 1 Guidelines (AENV 2010a) were used. Although the AB Tier 1 Guidelines guidance (AENV 2010a) allows for the use of soil allocation factors greater than 0.2 for some substances (generally petroleum hydrocarbon associated contaminants), in order to account for the many different chemicals identified and the possibility of not accounting for additive effects of substances acting on the same toxicological endpoints, a SAF of 0.2 was conservatively used for screening purposes.

The attenuation factor used was 0.01 for subslab soil vapour to indoor air based on recent work conducted by AENV (Personal Communication, 2011). The selection of an attenuation factor of 0.01 is conservative as it does not take into account the distance between the buildings and the source as there is uncertainty with respect to the depths of basements relative to the water table; as a result the “de minimus” subslab indoor air attenuation factor was utilized. Similarly, the biodegradation adjustment factor (BAF) was assumed to be 1.0 for all chemicals (no adjustment). For RfCs for non-carcinogens, the tolerable concentration values in Table C-9 of the AB Tier 1 Guidelines (AENV 2010a) were used. For carcinogenic substances, the RsC was calculated using the following equation:

$$RsC = \frac{ILCR}{UR}$$

where:
ILCR = Incremental lifetime cancer risk (unitless)
UR = Inhalation unit risk $(\mu g/m^3)^{-1}$

Although an ILCR of 1x10-5 is provided as the target risk level in the AB Tier 2 Soil and Groundwater Remediation Guidelines (AENV 2010b), in order to account for the many different chemicals identified and the possibility of not accounting for additive effects of substances acting on the same toxicological endpoints an ILCR of 1x10-6 was conservatively used for screening purposes. For the UR, the Inhalation UR values in Table C-9 of the AB Tier 1 Guidelines (AENV 2010a) were used.

For select chemical parameters where toxicity reference values (TRVs) were not available, and detectable concentrations were measured, TRVs were obtained from the Health Canada (2009b), USEPA IRIS database (USEPA 2013a) or USEPA Regional Screening Levels (USEPA 2013b), where available.

7.2.4.3 Results of Screening

7.2.4.3.1 Soil Vapour

The volatile substances that were detected in soil vapour were retained as COPCs (CCME 2008) and site-specific screening criteria were developed for each of these substances for which inhalation TRVs are available (See Section 7.2.4.2.1).

As discussed above, the maximum soil vapour concentrations were compared to the site-specific screening criteria to identify COPCs to retain for risk assessment. The maximum concentrations of C8-C10 aromatics, C8-C10 aliphatics, C10-C12 aromatics, C10-C12 aliphatics, C12-C16 aliphatics, 1,3-butadiene, carbon tetrachloride, chloroform, naphthalene, nonane (n-), trimethylbenzene (1,2,3-), trimethylbenzene (1,2,4-), xylene (m- & p-), xylene (o-), and total xylenes exceeded the residential soil vapour screening value. In addition, maximum concentrations of C12-C16 aromatics, acetaldehyde, benzene, bromodichloromethane, ethylbenzene, 1,3-hexachlorobutadiene, methanol, 1,1,1,2-tetrachloroethane, and trichloroethylene were detected at a ratio of greater than 0.1 times the site-specific screening criteria and these COPCs were also conservatively retained for

assessment to prevent the possible elimination of chemicals that might act synergistically on the same toxicological endpoint.

For residential and commercial exposures, screening was conducted using soil vapour measurements as they are more representative of exposure conditions than soil vapour concentrations predicted using vapour intrusion modelling from groundwater. Site-specific screening criteria and screened soil vapour data are presented in Appendix C. A summary of the results of the soil vapour data screening are presented in Table 13.

Table 13: Summary of Soil Vapour Screening

Parameter	Site-specific Soil Vapour Screening Criteria ($\mu g/m^3$)	Maximum Measured Soil Vapour Concentration	Ratio of Measured Soil Vapour Concentration to Site-specific Screening Criteria	Retained for Risk Assessment (1)
Units	α = 0.01	$\mu g/m^3$	-	-
Petroleum Hydrocarbons				
nC6-nC8 (aliphatic)	3.66E+05	1.70E+03	4.64E-03	No
nC8-nC10 (aromatic)	3.25E+03	7.60E+04	2.34E+01	**Yes** (2)
nC8-nC10 (aliphatic)	1.92E+04	9.30E+04	4.84E+00	**Yes** (2)
nC10-nC12 (aromatic)	4.00E+03	4.30E+04	1.08E+01	**Yes** (3)
nC10-nC12 (aliphatic)	2.00E+04	1.20E+05	6.00E+00	**Yes** (3)
nC12-nC16 (aromatic)	1.00E+04	1.20E+03	1.20E-01	**Yes** (3)
nC12-nC16 (aliphatic)	2.00E+04	1.50E+05	7.50E+00	**Yes** (3)
Volatile Organic Compounds				
Acetaldehyde	4.55E+01	1.94E+01	4.27E-01	**Yes**
Acetone	6.20E+05	3.70E+01	5.97E-05	No
Acetonitrile	1.20E+03	2.07E-01	1.73E-04	No
Benzene	3.03E+01	1.46E+01	4.82E-01	**Yes**
Bromodichloromethane	2.70E+00	6.00E-01	2.22E-01	**Yes**
Butadiene (1,3-)	3.33E+00	3.07E+01	9.21E+00	**Yes**
Carbon disulfide	1.40E+04	5.33E+01	3.81E-03	No
Carbon tetrachloride	6.67E+00	1.70E+01	2.55E+00	**Yes**
Chlorobenzene	1.97E+02	4.30E+00	2.18E-02	No
Chlorodifluoromethane	1.00E+06	6.28E-01	6.28E-07	No
Chloroform	4.35E+00	1.50E+02	3.45E+01	**Yes**
Chloromethane	1.80E+03	1.71E+00	9.50E-04	No
Cumene	2.00E+04	1.54E+03	7.70E-02	No
Cyclohexane	1.20E+05	3.83E+01	3.19E-04	No
Dichlorodifluoromethane	2.00E+03	1.30E+01	6.50E-03	No
1,1-Dichloroethene	4.00E+03	2.50E-01	6.25E-05	No
Dichloroethene (1,2-), trans	1.20E+03	4.25E+00	3.54E-03	No

Parameter	Site-specific Soil Vapour Screening Criteria (µg/m^3)	Maximum Measured Soil Vapour Concentration	Ratio of Measured Soil Vapour Concentration to Site-specific Screening Criteria	Retained for Risk Assessment (1)
Ethylbenzene	1.99E+04	8.60E+03	4.33E-01	**Yes**
Hexachlorobutadiene (1,3-)	4.55E+00	5.00E-01	1.10E-01	**Yes**
Hexane (n-)	1.40E+04	1.21E+02	8.64E-03	No
Isopropyl alcohol	1.40E+05	4.00E+00	2.86E-05	No
Methanol	4.32E+04	4.43E+03	1.03E-01	**Yes**
Methyl ethyl ketone	1.00E+05	2.00E+01	2.00E-04	No
Methyl isobutyl ketone	6.00E+04	1.52E+00	2.53E-05	No
Methyl methacrylate	1.04E+03	4.10E+00	3.94E-03	No
Methylene chloride	4.35E+03	2.20E+01	5.06E-03	No
Naphthalene	2.94E+00	3.20E+04	1.09E+04	**Yes**
Nonane (n-)	4.00E+03	4.50E+03	1.13E+00	**Yes**
Pentane (n-)	2.00E+04	4.36E+02	2.18E-02	No
Propylbenzene (n-)	2.00E+04	5.90E+02	2.95E-02	No
Propylene	6.00E+04	9.19E+02	1.53E-02	No
Styrene	1.83E+03	2.50E+01	1.36E-02	No
Tetrachloroethane (1,1,1,2-)	1.35E+01	4.60E+00	3.40E-01	**Yes**
Tetrachloroethene	7.20E+03	2.28E+02	3.17E-02	No
Toluene	7.51E+04	1.04E+03	1.38E-02	No
Trichlorobenzene (1,2,4-)	1.04E+02	8.60E-01	8.27E-03	No
1,1,1-Trichloroethane	1.00E+05	6.40E-01	6.40E-06	No
Trichloroethene	1.64E+02	1.71E+01	1.04E-01	**Yes**
Trichlorofluoromethane	1.40E+04	3.10E+00	2.21E-04	No
Trichlorotrifluoroethane (1,1,2-)	6.00E+05	7.20E-01	1.20E-06	No
Trimethylbenzene (1,2,3-)	1.00E+02	2.14E+03	2.14E+01	**Yes**
Trimethylbenzene (1,2,4-)	1.40E+02	1.07E+04	7.64E+01	**Yes**
Vinyl chloride	1.14E+01	2.14E-01	1.88E-02	No
Xylene (m- & p-)	2.00E+03	2.07E+04	1.04E+01	**Yes**
Xylene (o-)	2.00E+03	8.26E+03	4.13E+00	**Yes**
Xylenes (total)	3.56E+03	3.30E+04	9.26E+00	**Yes**

Notes:

(1) Contaminants of Potential Concern were conservatively retained for risk assessment if the measured ratio of soil vapour concentrations versus the site-specific soil vapour screening criteria is greater than 0.1. A ratio greater than 0.1 was included as a screening criterion to prevent screening out of COPCs which may act on the same toxicological endpoint.

(2) Assessed as CWS PHC F1

(3) Assessed as CWS PHC F2

"-" - not applicable

µg/m^3 - micrograms per cubic metre

Yes – COPC retained for risk assessment

7.2.5 Identification of Operable Exposure Pathways

Exposure pathways that were retained for the HHRA are listed below.

- Inhalation of vapours in indoor air resulting from vapour intrusion into the building from soil or groundwater by residents or commercial workers;

Other exposure pathways which were considered but not retained for further assessment include the following:

- Inhalation of vapours in outdoor air resulting from vapour intrusion from soil or groundwater for residents/commercial workers was not retained for further assessment as indoor air is a more conservative surrogate for the estimation of risk as significant dilution is expected outdoors;
- Inhalation of vapours in outdoor air resulting from vapour intrusion from soil or groundwater for maintenance workers was not retained for further assessment as the resident/commercial worker assessment was considered a conservative surrogate for intermittent outdoor exposure because it is expected to be much less than a continuous indoor air exposure. The more significant outdoor air exposure is the exposure of construction workers with trench air present in subsurface excavations which was retained for further assessment; and
- Ingestion of groundwater for potable purposes by residents, commercial workers or construction workers as potable water is provided by the City of Calgary.

In addition to the pathways identified above, the permeation of chemicals via water and sewage pipes was also considered from the aspects of preferential pathways and the potential for the damage to occur to these utilities. Unlike the other pathways, this pathway could not be assessed quantitatively; however, a qualitative assessment of permeation of chemicals in utility pipes was previously provided in Golder 2011a.

A Screening Level HHRA for construction workers, as well as residential occupants, was previously completed in Golder 2011a. The construction worker assessment was based on exposure to vapours in trenches, which were estimated from groundwater concentrations. Given that the groundwater concentrations for monitoring conducted in 2012 were similar to 2011, the assessment was not updated in this report.

7.2.6 Problem Formulation Checklist

A problem formulation checklist is provided in Table 14 below (as per Health Canada 2010a), and summarizes the Problem Formulation for the Site (*i.e.*, the land use, receptors and operable/inoperable exposure pathways).

Table 14 - Problem Formulation Checklist

Land Uses (check [√] as appropriate)		Receptor Group(s) (check [√] as appropriate)		Critical Receptors (check [√] as appropriate)		Exposure Pathways (check [√] as appropriate)						
	[√]		[√]		[√]	Soil ingestion	Soil dermal absorption	Particulate inhalation	Indoor vapour inhalation	Outdoor vapour inhalation	Ingestion of contaminated groundwater	Dermal Contact groundwater
Agricultural		General public	√	Infant								
Residential	√	Employees	√	Toddler	√				√			
Commercial with daycare [1]		Canadian First Nation communities	√	Child	√				√			
Commercial without daycare	√	Other (specify)		Adult	√				√			
Industrial		Other (specify)		Maintenance Worker								
Recreational, (such as urban park)		Other (specify)		Commercial Worker	√				√			
				Construction Worker								

Note: Outdoor inhalation could also potentially occur but is not considered significant relative to indoor air inhalation.

7.3 Exposure Assessment

7.3.1 Characterization of Potential Receptors, Exposure Frequency and Duration

Receptor characteristics used to evaluate potential exposure from soil vapour at the Site are presented in Table 15. To evaluate the potential exposure of current/future residential users, the toddler (*i.e.*, ages 7 months to 4 years) was selected for the assessment of non-carcinogens, while an adult (*i.*e., age >20 years) was selected for exposure to carcinogens. The toddler was selected for the assessment of non-carcinogens, as this is the age category which has the greatest exposure to body weight ratio and thus the highest risk estimates. Residents were conservatively used to assess indoor air exposures to commercial workers as the greater relative exposure for residents to indoor air is considered to be protective of the exposure for a commercial worker or church attendee.

Table 15: Human Receptor Characteristics (Residents)

Parameters	Current/Future Residential Scenario	
	Toddler Resident (7 months – 4 years)	Adult Resident (>20 years)
Time spent outdoors (hours/day)	1.5	1.5
Time spent indoors (hours /day)	22.5	22.5
Days per week exposed (days)	7	7
Weeks per year exposed (weeks)	52	52
Total years exposed to site (years)	4.5	80
Years for carcinogen amortization (years)	N/A	80

Notes:
Receptor characteristics are from Health Canada (2010a), unless otherwise noted.
N/A – not applicable

7.3.2 Exposure Concentrations

Maximum measured soil vapour concentrations of COPCs were used in the Screening Level HHRA (Appendix C for soil vapour and Table 7, 8 and 9 for groundwater).

7.3.3 Environmental Fate Modeling

Soil vapour data were available, and therefore exposure concentrations for the inhalation of the indoor air for residents and commercial workers were calculated based on maximum soil vapour concentrations and the “de minimus” ESRD attenuation factor (indoor air concentration divided by the soil vapour concentration) of 0.01 for subslab to indoor air vapour intrusion, using the *Health Canada Spreadsheet Tool for Preliminary Quantitative Risk Assessment* (Health Canada 2009a). This factor (0.01) is considered an appropriate factor for estimation of indoor vapour concentrations for single-family and duplex houses with typical depth basements or crawlspaces because of the relatively close proximity (i.e., possibly within a metre in some cases) of the soil vapour probes to the lowest point of house. The attenuation factor assumes that there is not a sump in the basement for the pumping of groundwater.

7.3.4 Exposure Equations

For the risk assessment, exposure estimates were calculated for each exposure pathway retained for assessment. Exposure equations were obtained from Health Canada (2009a) and US EPA (2004) The *Health Canada Spreadsheet Tool for Preliminary Quantitative Risk Assessment* (Health Canada 2009a) was used for modelling.

Equations used to estimate exposure doses are listed below and calculated exposure doses are provided by receptor type in Appendix D. Sample calculations are also provided in Appendix D.

Inhalation of Contaminant Vapours Dose Rate

$$DR_v = \frac{C_A \times RAF_{inh} \times D_1 \times D_2 \times D_3 \times D_4}{LE}$$

Where:
DRV = dose rate from inhalation of COPC in soil vapour (mg/kg bw-day)
CA = COPC concentration in air (mg/m^3)
RAF_{inh} = bioavailability via inhalation (unitless)
D_1= hours per day exposed (hours/day)
D_2= days per week exposed /7 days
D_3= weeks per year exposed /52 weeks
D_4= total years exposed to Site (for carcinogens only)
LE = life expectancy (years) (for carcinogens only)

7.4 Toxicity Assessment

7.4.1 Contaminant Classification

Several organizations have developed classification systems based on the carcinogenic properties of chemicals. The classification systems for Health Canada (2009b), the International Agency for Research on Cancer (IARC 2010) and the US EPA Integrated Risk Information System (IRIS) database (US EPA 2013a) are presented in Table 16. The COPC carcinogenic classification is provided in Table 17.

Table 16: Carcinogen Classification Systems used by Health Canada and US EPA

Health Canada[1]	IARC[2]	US EPA[3]	Description
Group I	Group 1	Group A	Human carcinogen
Group II	Group 2A	Group B	Probable human carcinogen
		Group B1	Limited human evidence available
		Group B2	Inadequate human evidence, sufficient animal evidence
Group III	Group 2B	Group C	Possible human carcinogen
Group IV	Group 3	Group D	Unclassifiable as to human carcinogenicity/ Unlikely to be a carcinogen (Health Canada only)
Group V	Group 4	Group E	Probably not carcinogenic to humans
Group VI	-	-	Unclassifiable as to human carcinogenicity

Notes:
1) Health Canada 2010b
2) IARC 2010
3) US EPA 2013a

Table 17: COPC Carcinogen Classification

COPC	Health Canada[1]	IARC[2]	US EPA[3]	Assessed as a Carcinogen?
Volatile Organic Compounds				
Acetaldehyde	N/C	2B	B2	Yes
Bromodichloromethane	N/C	Group 2B	Group B2[4]	Yes
1,3-Butadiene	N/C	Group 1	Group B2	Yes
Carbon tetrachloride	Group III [4]	Group 2B	Group B2	Yes
Chloroform	N/C	Group 2B	Group B2	Yes
1,3-Hexachlorobutadiene	N/C	Group 3	Group C	Yes
Methanol	N/C	N/C	N/C	No
Nonane (n-)	N/C	N/C	N/C	No
1,1,1,2-Tetrachloroethane	N/C	Group 2B	Group C	Yes
Trichloroethylene	Group II	Group 1	Group A	Yes
1,2,3-Trimethylbenzene	N/C	N/C	N/C	No
1,2,4-Trimethylbenzene	N/C	N/C	N/C	No
BTEX				
Benzene	Group I	Group 1	Group A	Yes
Ethylbenzene	N/C	Group 2B	Group D	No
Xylene (m- & p-)	N/C	N/C	N/C	No
Xylene (o-)	N/C	N/C	N/C	No
Xylene (total)	Group IV	Group 3	N/C	No
Polycyclic Aromatic Hydrocarbons				
Naphthalene	N/C	Group 2B	N/C (formerly Group C)	Yes
Petroleum Hydrocarbons				
CWS PHC F1	N/C	N/C	N/C	No
CWS PHC F2	N/C	N/C	N/C	No

Notes:
N/C – not classified
(1) Health Canada 2010b
(2) IARC 2010
(3) US EPA 2013a
(4) Classification is for the oral pathway

Acetaldehyde, benzene, bromodichloromethane, 1,3-butadiene, carbon tetrachloride, chloroform and 1,3-hexachlorobutadiene, 1,1,1,2-tetrachloroethane, trichloroethylene and naphthalene (through the inhalation pathway) were assessed as carcinogens (*i.e.*, non-threshold acting chemicals), whereas the remaining COPCs were assessed as non-carcinogens (*i.e.*, threshold acting chemicals).

7.4.2 Toxicity Reference Values (TRVs)

Toxicity assessment involves identification of the potentially toxic effects of chemicals and determination of the amount of chemicals that people can be exposed to without experiencing adverse health effects. The toxicity assessment provides the basis for evaluating what is an acceptable exposure and what level of exposure may adversely affect people's health. The toxicity assessment provides a measure of the potential for adverse effects to carcinogenic (non-threshold) and non-carcinogenic (threshold) chemicals.

For threshold contaminants, an exposure limit or reference dose and the exposure from the Site are expressed as mg of contaminant per kg of body weight per day (mg/kg bw-day). For non-threshold chemicals, the TRV is expressed as a slope factor. The slope factor converts the estimated dose rate over a lifetime of exposure to incremental risk of developing cancer.

Toxicity reference values were selected preferentially from Alberta Environment (AENV 2010a) and Health Canada (2009b). Where an Alberta Environment value was not available, Health Canada (2009b), US EPA IRIS database (US EPA 2013a) or US EPA RSL (US EPA 2013b) values were used (the source of the toxicity reference values for naphthalene is discussed below).

7.5 Risk Characterization

For a threshold acting chemical, the risk characterization is expressed as a hazard quotient, such that hazard quotient = (estimated exposure)/(reference dose). The hazard quotients for a COPC associated with the different pathways of exposure are added to determine the potential risk associated with total exposure to a chemical. In addition, hazard quotients calculated for different COPCs are summed if they have the same mode(s) of action on a target organ. Alberta Environment (2010b) considers risk for non-carcinogens negligible if the exposure dose does not exceed the tolerable daily intake specified by Health Canada or other appropriate regulatory agency and also includes background exposure. As there is limited background information for many of the substances measured in soil vapour in this assessment, an HQ of 0.2 was considered negligible for substances other than CWS PHC fractions, following Health Canada (2010a). The recent CWS PHC were derived using a soil allocation factor of 0.5 for CWS PHC F1 and F2 because they are not typically present in food or consumer products (CCME 2008). Based on this recent guidance by CCME (2008), it is considered reasonable to adopt an acceptable threshold level of 0.5 for CWS PHC F1 and F2. Although the AB Tier 1 Guidelines guidance (AENV 2010a) allows for the use of soil allocation factors greater than 0.2 for some substances, in order to account for the many different chemicals identified and the possibility of not accounting for additive effects of substances acting on the same toxicological endpoints, a SAF of 0.2 was conservatively used for screening purposes (other than for petroleum hydrocarbon fractions as identified above). Due to the conservative nature of the assumptions, HQs greater than 0.2 or 0.5 does not necessarily mean risks are unacceptable; however, it would indicate that further assessment may be required.

For a non-threshold acting chemical, the incremental lifetime cancer risk (ILCR) for the Site is calculated as the (predicted exposure) x (slope factor). Alberta Environment considers the acceptable ILCR to be one in one hundred thousand (1×10^{-5}) (AENV 2010b). An ILCR of greater than 1×10^{-5} is indicative of a potential health concern that should be more closely examined. An ILCR of less than 1×10^{-5} is considered essentially negligible (AENV 2010b).

7.5.1 Results

Health risks were evaluated for potential human receptors at the Site using maximum soil vapour concentrations at the Site over the three monitoring events. A summary of risk estimates for COPCs for each of the receptors are summarized in Table 18. Calculated exposure doses (*i.e.*, PQRA model output) are provided by receptor type in Appendix D. Sample calculations were also conducted manually to provide an additional check for the model calculations and are also included in Appendix D.

The Screening Level HHRA Update evaluated potential risks for current and future users at the Site. The assessment identified possible unacceptable risks to residents using the maximum measured concentration. The predicted HQs and ILCR values that exceed target risk levels (HQ = 0.2 [or 0.5 for CWS PHC F2]; ILCR = 1.0E-05) are bolded and underlined in Table 18 below. A summary of risks by toxicological endpoint is provided in Table 19.

Table 18: Risk Estimates for Exposure to COPCs at the Site

COPC	Toddler Resident	Adult Resident
	Hazard Quotient	ILCR
Volatile Organic Compounds		
Acetaldehyde	0.02	4.0E-07
Bromodichloromethane	N/A	2.1E-07
1,3-Butadiene	0.1	8.6E-06
Carbon tetrachloride	0.05	2.4E-06
Chloroform	0.03	**3.2E-05**
1,3-Hexachlrorobutadiene	N/A	1.0E-07
Methanol	0.02	N/A
Nonane	**0.21**	N/A
1,1,1,2-Tetrachloroethane	N/A	3.2E-07
Trichloroethylene	4.0E-03	9.8E-08
1,2,3-Trimethylbenzene	**4.0**	N/A
1,2,4-Trimethylbenzene	**14**	N/A
BTEX		
Benzene	4.6E-03	4.5E-07
Ethylbenzene	0.08	N/A
Xylene, o-	**0.8**	N/A
Xylene, m- & p-	**1.9**	N/A
Xylenes (Total)	**1.7**	N/A
Polycyclic Aromatic Hydrocarbons		
Naphthalene	**100**	**1.0E-02**
Petroleum Hydrocarbons		
CWS PHC F1	0.4	N/A
CWS PHC F2	**3.2**	N/A

Notes:
CWS PHC – Canada-wide Standard for Petroleum Hydrocarbons
N/A - not applicable
Bold and underlined risk estimates exceed the threshold for acceptable risk of 0.2 (0.5 for PHCs) for HQs and/or 1 x 10^{-5} for ILCRs.

Table 19: Risk Estimates for Exposure to Contaminants of Potential Concern Summarized by Target Organ/Critical Effects

Target Organ/System/Effect	COPCs	Residential Scenario	
Non-Carcinogenic Effects (Hazard Quotients)		**Toddler**	**Adult**
Nasal/olfactory	Acetaldehyde Naphthalene	**1.0E+02**	**1.0E+02**
Reproductive	Butadiene (1,3-) Xylene (total)	**1.9E+00**	**1.9E+00**
Hepatic	Carbon tetrachloride Chloroform Methanol Aliphatics C_8-C_{10} Aliphatics $C_{>10}$-C_{12} Aliphatics $C_{>12}$-C_{16}	**3.2E+00**	**3.2E+00**
Nervous System	Trichloroethene Trimethylbenzene (1,2,3-) Xylene (m- & p-) Xylene (o-) Aliphatics C_6-C_8	**6.8E+00**	**6.8E+00**
Body Weight	Nonane (n-) Aromatics C_8-C_{10} Aromatics $C_{>10}$-C_{12} Aromatics $C_{>12}$-C_{16}	**6.5E-01**	**6.5E-01**
Hematological changes	Trimethylbenzene (1,2,4-) Aliphatics C_8-C_{10} Aliphatics $C_{>10}$-C_{12} Aliphatics $C_{>12}$-C_{16}	**1.7E+01**	**1.7E+01**
Developmental/fetal effects	Ethylbenzene Xylene (total)	**1.8E+00**	**1.8E+00**
Carcinogenic Effects (ILCRs)		**Toddler**	**Adult**
Nasal/olfactory	Acetaldehyde Naphthalene	N/A	**1.0E-02**
Leukemia	Benzene Butadiene (1,3-)	N/A	9.1E-06
Hepatic tumours/carcinomas	Carbon tetrachloride Chloroform 1,1,1,2-Tetrachloroethane	N/A	**3.5E-05**
Renal/kidney adenomas and adenocarcinomas	Bromodichloromethane Hexachlorobutadiene	N/A	3.1E-07

Notes:
N/A – Not Applicable.
Bold and underlined risk estimates exceed the threshold for acceptable risk of 0.2 for HQs and/or 1 x 10^{-5} for ILCRs.

The environmental fate and transport modeling of soil vapour intrusion utilized a vapour attenuation factor of 0.01, which is considered by AENV an appropriate factor for estimation of indoor vapour concentrations for a subslab vapour source directly below a building. For this assessment, soil vapour concentrations were measured at probes constructed adjacent to sidewalks, and the probe (MW10-6) with elevated soil vapour concentrations of potential concern is installed between 3.04 and 3.15 m depth below ground surface. Given that there are houses with basements in the Site area, the vertical distance between the basement and lateral projection of the elevation where relatively high hydrocarbon vapour concentrations were measured is estimated to be approximately 1 m, but for estimation purposes, a subslab attenuation factor was conservatively chosen.

The vapour attenuation factor does not include possible concentration reduction through aerobic biodegradation. Although the distance between buildings and vapour source is relatively small, aerobic biodegradation of BTEX and naphthalene vapours is typically a rapid process and orders-of-magnitude attenuation in hydrocarbon vapour concentrations over relatively short distances (often less than 1 m) has been observed at many other sites (US EPA, 2013). While aerobic biodegradation of hydrocarbon vapours is expected to be occurring below houses, additional monitoring is required to assess biodegradation conditions below and near houses and the potential for vapour intrusion.

Table 20 provides a summary of locations for those COPCs for which risk estimates exceeded target risk levels. All maximum concentrations on which the risk estimates are based represent samples collected at location MW10-6. The estimated risks for measured concentrations at all other locations are below the target risk levels except for chloroform at one location (MW10-3B) and naphthalene at three locations (MW10-7B, MW10-11, and MW10-15). It should be noted, however, that measured soil vapour concentrations of naphthalene are approximately three orders of magnitude greater at MW10-6 compared to concentrations measured at the other three locations. This suggests that the predicted potentially unacceptable risks are highest around the area in the vicinity of MW10-06.

Table 20: Summary of COPCs and Locations Exceeding Target Risk Levels

COPCs exceeding ILCR of 10^{-5}	ILCR	Maximum Concentration	Location	Threshold Concentration at ILCR = 10^{-5}	Locations with Concentrations Exceeding Threshold	2nd Highest Concentration	Location of 2nd Highest Concentration
Chloroform	3.2E-05	150	MW10-6	46	MW10-6, MW10-3B	79.6	MW10-6
Naphthalene	1.0E-02	32000	MW10-6	31	MW10-6, MW10-7B, MW10-11, MW10-15	29100	MW10-6
COPCs exceeding HQ of 0.2	**HQ**	**Maximum Concentration**	**Location**	**Threshold Concentration at HQ = 0.2**	**Locations with Concentrations Exceeding Threshold**	**2nd Highest Concentration**	**Location of 2nd Highest Concentration**
Nonane	0.2	4500	MW10-6	4265	MW10-6	20.1	MW10-6
1,2,3-Trimethylbenzene	4.0	2140	MW10-6	107	MW10-6	578	MW10-6
1,2,4-Trimethylbenzene	14.3	10700	MW10-6	150	MW10-6	1380	MW10-6
Xylene, o-	0.8	8260	MW10-6	2134	MW10-6	82.5	MW10-6
Xylene, m- & p-	1.9	20700	MW10-6	2134	MW10-6	104	MW10-6
Xylenes (Total)	1.7	33000	MW10-6	3837	MW10-6	28900	MW10-6
Naphthalene	100	32000	MW10-6	64	MW10-6	29100	MW10-6
CWS PHC F1	0.4	180000	MW10-6	100840	MW10-6	3700	MW10-9B
CWS PHC F2	3.2	310000	MW10-6	19195	MW10-6	8100	MW10-6

Notes:
All concentrations in units of $\mu g/m^3$

7.5.2 Uncertainty Evaluation

This assessment of potential risk to receptors on the Site was evaluated using generally conservative assumptions. Table 21 below outlines the sources of uncertainty for the Screening Level HHRA.

Table 21: Evaluation of Uncertainty in the Screening Level Human Health Risk Assessment

Assumption	Uncertainty	Under / Overestimate of Risk	Rationale
Exposure Assumptions			
Likelihood that site characterization was able to capture maximum contaminant concentrations	Moderate	Under/ overestimate	The current investigation targeted areas of potential contamination; however, it is possible that there are other locations on the Site with higher concentrations of certain COPCs. Therefore, risk could be under or overestimated.
Use of vapour attenuation factor of 0.01 for prediction of indoor air concentrations	Moderate to high	Most likely overestimate	An attenuation factor of 0.01 is considered a relatively conservative factor for subslab soil vapour samples (*i.e.*, obtained directly below the foundation). The soil vapour samples were obtained beside houses at elevations that were likely below the base of the foundation. The 0.01 factor does not account for vapour attenuation in soil between the probe and building, and therefore is most likely conservative because of attenuation processes such as diffusion and aerobic biodegradation. Lateral variability in soil vapour concentrations is expected and this will contribute to the uncertainty in prediction of indoor air concentrations.
Body weights, inhalation rates, skin surface area	Low	Neutral	Based on average Canadian exposure characteristics (Health Canada 2010a).
Exposure assumptions	Low	Neutral	Based on average Canadian exposure characteristics (Health Canada 2010a).
Toxicity Assessment			
Multiple contaminants were detected for which toxicity reference values are not available	Moderate	Underestimate	Multiple contaminants were detected in soil vapour for which toxicity reference values or surrogates with toxicity reference values are unavailable and as a result, screening criteria could not be developed for them in the risk assessment. This could result in an underestimate of risk.
Assessment of naphthalene as a carcinogen	Moderate	Under/ overestimate	The hierarchy for selection of toxicity reference values in Alberta for the purposes of contaminated sites risk assessment is to first select the values provided in the AENV Tier 1 guidance and to then default to Health Canada followed by US EPA. AENV, Health Canada, and US EPA have not yet derived an inhalation unit risk for naphthalene. It is understood that US EPA is working on the derivation of an inhalation unit risk for naphthalene. Although not typical practice, risk estimates for naphthalene as a carcinogen have been calculated using the available CalEPA inhalation unit risk (as cited in

Assumption	Uncertainty	Under / Overestimate of Risk	Rationale
			US EPA 2013b). It is noted that US EPA developed a draft inhalation unit risk for public comment in 2004 which was more conservative than that provided by CalEPA and that the US EPA (2004) value has not yet been finalized. The World Health Organization (WHO) developed an RfC in 2005 for naphthalene and indicates that the RfC is protective of carcinogenic effects as naphthalene is thought to act through a non-genotoxic mechanism (WHO 2005). The RfC derived by WHO is less stringent than the value used in this report which was derived by USEPA. In 2012, Health Canada adopted the WHO RfC as a provisional indoor air quality guideline for naphthalene (Health Canada 2012) which it then put forward for public comment.
Toxicity reference values (non-carcinogens)	Low (based on humans) to high (based on animals)	Overestimate	Toxicity data are based on sensitive endpoints. Uncertainty and safety factors are applied to account for inter and intra species variability.
Toxicity reference values (carcinogens)	Low (based on humans) to high (based on animals)	Overestimate	Toxicity data are based on sensitive endpoints. High dose to low dose extrapolation methods are typically conservative.

7.5.3 Screening Level Human Health Risk Assessment Conclusions

The Screening Level HHRA Update evaluated potential risks for current and future users. Maximum soil vapour concentrations were used to estimate exposure through inhalation of indoor/outdoor air, resulting in conservative estimates of risk.

The updated Screening Level HHRA identified possible unacceptable risks to residents for several non-carcinogenic chemicals associated with Site contamination using the maximum measured soil vapour concentration. The highest HQ of 100 was estimated for naphthalene while the highest ILCR of 3.2E-05 was estimated for chloroform (not considered a chemical associated with Site contamination). Health Canada and US EPA have not yet derived an inhalation unit risk for naphthalene. It is understood that US EPA is working on the derivation of an inhalation unit risk for naphthalene. Although not typical practice, risk estimates for naphthalene as a carcinogen have been calculated using the available CalEPA inhalation unit risk (as cited in US EPA 2013b. The World Health Organization (WHO) developed an RfC in 2005 for naphthalene and indicates that the RfC is protective of carcinogenic effects as naphthalene is thought to act through a non-genotoxic mechanism (WHO 2005). The RfC derived by WHO is less stringent than the value used in this report which was derived by USEPA. There is currently considerable uncertainty in assessing naphthalene as a carcinogen via the inhalation route of exposure and it is anticipated that this is a highly conservative estimate of potential risk.

All maximum concentrations on which the risk estimates are based represent samples collected at location MW10-6. The estimated risks for measured concentrations at all other locations are below the target risk levels except for chloroform (location MW10-3B). This would suggest that the predicted risks are isolated to the area in the vicinity of MW10-06 and may be related to the NAPL that was only detected at this location. It should be noted that NAPL was also detected on the CBC property; however, assessment of potential risk to occupants of the commercial CBC building was not within the scope of this investigation. Soil vapour samples were not collected directly from the CBC property; however, samples were collected from VP11-08 and VP11-09 located in the alleyway directed north of the CBC building and all concentrations were below the site-specific screening criteria. As previously mentioned, NAPL may also be present in the vicinity of MW11-06. Soil vapour samples were not collected from MW11-06 as this was a deep bedrock well with no screen within the vadose zone; however, soil vapour samples were collected MW10-01 (approximately 50 m west of MW11-6) in 2011 and 2012 and from MW10-2 (approximately 20 m east of MW11-6) in 2011 and concentrations were below the screening level criteria.

The risk assessment incorporated several potentially conservative assumptions including a vapour attenuation factor of 0.01 for soil vapour intrusion into houses and therefore hazard quotients may be overestimated. Additional monitoring is required to assess concentration attenuation below houses of potential concern near detected NAPL and the potential for vapour intrusion into these homes.

Chloroform is not considered a chemical associated with the historic wood preservative contamination, and its presence is more likely related to leaking of chlorinated water from the City of Calgary water supply. Chloroform is generated when chlorine treated water reacts with organic matter dissolved in the groundwater or in soil. Chloroform is often detected in soil and groundwater in urban areas as a result of sources such as the unintended releases of chlorinated water include leaking distribution lines for drinking water and wastewater (sewer mains), firefighting, irrigation of lawns, gardens, parks and golf courses, and leaks from swimming pools (Ivahnenko and Barbash 2004). Although the ILCR estimated for chloroform in this study was above the target risk level, it should be noted that background concentrations of chloroform in indoor air often exceed the acceptable risk level of 1×10^{-5}. A compilation of data from 18 indoor air studies conducted primarily in the United States on mainly residential properties found background concentrations of chloroform ranging up to 20.2 $\mu g/m^3$, with a median concentration of 1.1 $\mu g/m^3$ (Dawson and McAlary 2009). In addition, the background air concentration reported in the Alberta Tier 1 Guidelines is 6.3 $\mu g/m^3$. For an air chloroform concentration range of 1.1 $\mu g/m^3$ to 6.3 $\mu g/m^3$, the estimated cancer risk assuming a residential receptor, lifetime continuous exposure and assumptions incorporated in the Alberta Tier 1 Guidelines ranges between 2.5×10^{-5} and 1.4×10^{-4}. This cancer risk exceeds the acceptable risk level of 1×10^{-5} based on Health Canada guidance and precedent from ESRD (ESRD 2010a).

Groundwater was collected primarily for purposes of delineation of the plume and concentrations in shallow groundwater at several locations are indicative of NAPL. Drinking water is not currently consumed on-Site as the area is municipally serviced; however, exposure controls may need to be put in place to prevent hypothetical future groundwater consumption.

To mitigate risks to construction workers exposed to volatiles in trenches, sufficient ventilation should be provided if trench work is conducted. In addition, as a precaution, proper personal protective equipment should be worn to limit direct contact with contaminated soil, groundwater, and dust suppression measures should be taken to limit the amount of dust generated. A site-specific Health and Safety Plan should also be developed for the Site before undertaking construction activities.

8.0 CONCLUSIONS AND RECOMMENDATIONS

This report presents an updated Screening Level HHRA for a primarily residential area of Calgary, Alberta, located north of the Bow River and former Canada Creosote site, referred to as the "North Bow Site" or "Site". The HHRA is required to evaluate creosote-related contamination that has migrated from the Canada Creosote Site, located south of the Bow River, to the North Bow Site area. Wood-preserving operations historically took place on the Canada Creosote Site and involved the use of tars, creosote, petroleum oils and pentachlorophenol.

The purpose of this project is to assess the potential risk to human health associated with possible exposure to subsurface contamination from the Canada Creosote Site (primarily creosote) by residents of homes and construction utility workers. The primary exposure pathway of concern for the Site is soil vapour intrusion into buildings and utility trenches. Creosote impacts that are present at the Site consist of dense non-aqueous phase liquid (DNAPL) and light non-aqueous phase liquid (LNAPL) and dissolved chemicals in groundwater (referred as the "dissolved plume"). The extents of the DNAPL, LNAPL and dissolved plume have not been delineated by this HHRA.

The original soil vapour and HHRA was conducted in 2010 and 2011. Additional field investigation was conducted in 2012 and 2013 to support this updated HHRA. The field investigation consisted of drilling of additional boreholes and installation of wells, one additional groundwater monitoring event (November 2012), and two additional soil vapour monitoring events (November 2012 and April 2013). The purpose of the investigation program was to better characterize shallow groundwater and soil vapour quality near to the water table to provide information needed to assess the soil vapour intrusion pathway. Given this focus, the scope of work for this project did not include a detailed hydrogeological assessment or delineation of DNAPL migration pathways or the dissolved phase groundwater plume. The intrusive investigation was limited to residential areas and did not include for example the CBC site where there are known creosote impacts (outside of the scope of this assessment).

Groundwater analytical data was compared to the Alberta Tier 2 Guidelines. Results indicated that the PHC F2 fraction, naphthalene, 2-methylnaphthalene and chloroform concentrations exceeded the guidelines for the inhalation pathway (*i.e.*, indoor soil vapour intrusion) at multiple locations across the Site. The maximum groundwater concentrations (2011 to 2013) of select analytes commonly associated with creosote impacts were a benzene concentration of 0.86 mg/L, naphthalene concentration of 15 mg/L, 2-methylnaphthalene of 1.6 mg/L and PHC fraction F2 concentration of 30 mg/L, respectively. There are no Alberta Tier 1 Guidelines for soil vapour concentrations; however, soil vapour was considered through the Screening Level HHRA using risk-based, site-specific soil vapour screening criteria. The maximum soil vapour concentrations (2011 to 2013) of select analytes commonly associated with creosote impacts were a benzene concentration of 14.6 $\mu g/m^3$, naphthalene concentration of 32,000 $\mu g/m^3$, and PHC fraction F1 and F2 concentrations of 180,000 $\mu g/m^3$ and 310,000 $\mu g/m^3$, respectively. The updated groundwater and soil vapour characterization results are consistent with a creosote contamination source.

An updated CSM was developed based on the results of the 2011 site investigation/HHRA and this 2013 HHRA Update. The Site geology consists mainly of surficial coarse-grained soil deposits, underlain by siltstone bedrock encountered between 3.7 and 6.5 m below ground surface at borehole locations. There is evidence of creosote impacts in bedrock, and in soil above the bedrock at three monitoring wells along Broadview Road NW (MW10-6, MW10-7B and MW11-01), which is generally consistent with the area with historical indications of

NAPL. In 2011, MW10-6 had a creosote-like LNAPL sheen at the water table, whereas in 2012/2013 there was 0.57 m of LNAPL (2012) and 0.44 m of DNAPL (2013) present in the well. Compositional analysis of a NAPL sample from this well indicated naphthalene as the primary component. Evidence of creosote impacts were also noted at MW11-06 located north of Westmount Boulevard near 18th Street, where no historical impacts of NAPL have been noted, and at wells on the CBC property.

The relatively low soil vapour concentrations measured at the Site (excluding MW10-6) represent a relatively weak vapour source consistent with a dissolved phase source and a water table that was sufficiently high such that the NAPL source zones were likely submerged below the water table. At MW10-6, where NAPL was detected, the vapour concentrations were significantly higher. The naphthalene and F1 and F2 concentrations in soil vapour at this location were between 50 and 700 times higher than the next highest concentration measured, suggesting a NAPL source in the vadose zone near MW10-6. For dissolved sources, aerobic biodegradation is expected to result in relatively rapid attenuation of the vapours for the chemicals of potential concern identified above. The measured elevated oxygen concentrations and somewhat elevated carbon dioxide concentrations (carbon dioxide is produced from aerobic biodegradation) are indicators that aerobic biodegradation is occurring within the vadose zone and is resulting in attenuation of creosote vapour concentrations. Groundwater level monitoring was conducted for several months in 2012 and 2013, and indicated that groundwater levels are affected by water levels in the Bow River. Groundwater levels were at their lowest point in fall (October and November) and early spring (March and April), but the water table remained above the bedrock surface at monitoring well locations. The recent soil vapour sampling targeted times when groundwater levels were relatively low and the vapour risk is assumed to be at its highest.

The updated human health risk assessment evaluated potential risks for current and future users. Maximum soil vapour concentrations were used to estimate exposure through inhalation of indoor/outdoor air, resulting in conservative estimates of risk. The exposure assessment applied a soil vapour attenuation factor (indoor air concentration divided by the soil vapour concentration) of 0.01 consistent with AENV policy to predict indoor vapour concentrations in residential single-family or duplex houses for subslab vapour sources. The exposure assessment assumes buildings with a basement or crawlspace construction of typical depth for residential houses, but that do not include a sump for pumping of groundwater. The attenuation factor of 0.01 does not include possible attenuation of petroleum hydrocarbon vapours through aerobic biodegradation, which can result in order-of-magnitude reductions in concentrations over relatively short distances, and thus likely is conservative.

The updated human health risk identified possible unacceptable risks to residents and construction workers for several non-carcinogenic and one carcinogenic chemical associated with Site contamination using the maximum measured soil vapour concentrations across the Site. The highest HQ of 100 and ILCR of 1.0E-02 were estimated for naphthalene, Health Canada and US EPA have not yet derived an inhalation unit risk for naphthalene. It is understood that US EPA is working on the derivation of an inhalation unit risk for naphthalene. Although not typical practice, risk estimates for naphthalene as a carcinogen have been calculated using the available CalEPA inhalation unit risk (as cited in US EPA 2013b. The World Health Organization (WHO) developed an RfC in 2005 for naphthalene and indicates that the RfC is protective of carcinogenic effects as naphthalene is thought to act through a non-genotoxic mechanism (WHO 2005). The RfC derived by WHO is less stringent than the value used in this report which was derived by USEPA. There is currently considerable uncertainty in assessing naphthalene as a carcinogen via the inhalation route of exposure and it is anticipated that this is a highly conservative estimate of potential risk.

Chloroform (not considered a chemical associated with Site contamination) was the only other carcinogenic COPC identified, for which an ILCR exceeding the acceptable risk threshold was estimated. All maximum concentrations on which the risk estimates are based represent samples collected at location MW10-6. The estimated risks for measured concentrations at all other locations are below the target risk levels except for chloroform at one location (MW10-3B) and naphthalene at three locations (MW10-7B, MW10-11, and MW10-15). It should be noted; however, that measured soil vapour concentrations of naphthalene are approximately three orders of magnitude greater at MW10-6 compared to concentrations measured at the other three locations. This suggests that the predicted potentially unacceptable risks are highest around the area in the vicinity of MW10-06. The risk assessment incorporated several potentially conservative assumptions including a vapour attenuation factor of 0.01 for soil vapour intrusion into houses and therefore hazard quotients may be overestimated. Additional soil vapour monitoring is required to assess biodegradation conditions and concentration attenuation below and near houses of potential concern and the potential for vapour intrusion.

Further investigation and monitoring is recommended to evaluate the potential for soil vapour intrusion into houses in the area of monitoring well MW10-6. The program would consist primarily of soil vapour concentration delineation, and subslab and indoor air monitoring in houses near to MW10-6. As elevated risk levels may be associated with the presence of NAPL, delineation of the NAPL near MW10-6 would be valuable. The collection of additional localized data on bedrock conditions and NAPL occurrences, and soil and groundwater quality should also be considered. Additional monitoring of seasonal concentration variability is also warranted to better understand conditions potentially influencing vapour intrusion (*e.g.*, monitoring during summer and winter conditions).

Groundwater monitoring indicates impact to groundwater and concentrations of select analytes above Alberta Tier 1 Guidelines for potable water use at several monitoring wells. Drinking water is not currently consumed on-Site as the area is municipally serviced; however, administrative controls or covenants may need to be put in place to prevent hypothetical future groundwater consumption.

The 2011 HHRA by Golder provided recommendations for preparation of a health and safety plan to address potential exposures to construction workers who undertake subsurface activities. In addition, given the presence of NAPL at the Site, important recommendations for risk management measures to minimize the potential for permeation or intrusion of contaminants into water mains were provided in the 2011 HHRA.

9.0 REPORT LIMITATIONS

This report has been prepared for the exclusive use of Alberta Environment and Sustainable Resource Development. The report, which specifically includes all tables, figures and appendices, is based on data and information collected during the site investigation activities conducted by Golder Associates Ltd., and is based solely on the conditions of the Site at the time of the field investigations, supplemented by historical information and data obtained by Golder Associates Ltd. as described in this report.

The assessment of environmental conditions and possible hazards at this Site has been made using the results of chemical analysis of groundwater and soil vapour samples collected from a limited number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Subsurface conditions may vary from these sample locations. Additional study, including further subsurface investigation, can reduce the inherent uncertainties associated with this type of study. However, it is never possible, even with exhaustive sampling and testing, to dismiss the possibility that part of a site may be contaminated and remain undetected.

The services performed as described in this report were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party other than Alberta Environment and Sustainable Resource Development makes of this report, or any reliance on, or decisions made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The content of this report is based on information collected during the sampling dates mentioned in the report, our present understanding of the site conditions, and our professional judgement in light of such information at the time of this report. This report provides a professional opinion and, therefore, no warranty is expressed, implied, or made as to the conclusions, advice and recommendations offered in this report. This report does not provide a legal opinion regarding compliance with applicable laws. With respect to regulatory compliance issues, it should be noted that regulatory statutes and the interpretation of regulatory statutes are subject to change.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required

10.0 CLOSURE

We trust that this report meets your current needs. If you have any questions or concerns, please do not hesitate to contact David Simpson at (403) 216 8936.

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TABLES

Table 1: Field Soil Vapour Screening and Leak Tracer Testing
Canada Creosote Site - North Bow
Screening Level Risk Assessment Update

Location										He Tracer Test		
	Date	Depth[4] (mbgs)	Flow (mL/min)	Vacuum ("H_2O)	PID[1] (ppm)	Combustible Gas[1] (ppm)	CH_4* (%)	CO_2* (%)	O_2* (%)	He Under Shroud (ppm)	He In Sample (ppm)	Leakage (%)
MW10-1 well	14-Mar-11	2.7-3.3	1600	10.7	0	220	-	0.2	20.7	380000	2100	0.55
	2-Nov-12	2.7-3.92	1000	0.2	0	75	0	1.4	20	-	-	-
MW10-1 deep probe	9-Mar-11	2.4-2.55	1500	8.3	0	75	-	0.2	20.3	-	-	-
	2-Nov-12		1000	0.5	0	80	0	1.1	20.4	-	-	-
MW10-2 well	9-Mar-11	2.5-3.1	1500	8	0	155	-	0.7	20.4	520000	6500	1.25
	2-Nov-12	2.5-3.65	1000	0.2	0	74	0	1.3	19.9	-	-	-
MW10-3B shallow probe	9-Mar-11	0.81-1.37	1500	0.6	0	240	-	0.7	20.5	380000	0	0.00
	2-Nov-12		1000	0.1	0	90	0	1.7	19.8	-	-	-
MW10-3B deep probe	9-Mar-11	1.68-2.13	1500	7	0	200	-	0.9	20.1	-	-	-
	2-Nov-12		1000	0.4	0	110	0	2.6	19.2	-	-	-
MW10-3B well	9-Mar-11	2.74-3.00	1500	6.6	0	420	-	1.1	19.3	-	-	-
	2-Nov-12	2.74-3.61	1000	0.2	0	110	0	4.0	17.7	-	-	-
MW10-5 well	11-Mar-11	2.13-3.9	1500	1.4	0	0	-	0.4	20.9	370000	125	0.03
	2-Nov-12	2.13-3.24	1000	0	0	95	0	1.9	19.9	-	-	-
MW10-5 deep probe	11-Mar-11	1.07-1.52	1500	1.4	0	0	-	0.1	20.9	-	-	-
	2-Nov-12		950	0.4	0	125	0	1.0	20.4	-	-	-
MW10-6 deep probe	10-Mar-11	1.65-2.44	1500	7.3	0	55	-	0.2	20.9	-	-	-
	2-Nov-12		1000	0.7	0	85	0	2.1	19.7	-	-	-
MW10-6 well	10-Mar-11	3.04-3.42	1500	3.60	1	150	-	0.3	20.9	-	-	-
	11-Mar-11	3.04-3.42	1500	NR	2	130	0	0.3	20.9	-		-
	2-Nov-12	3.04-3.71	1000	0.2	34	155	0	0.9	20.2	-	-	-
	25-Apr-13	3.04-3.15	1000	1.2	70.9	100	-	0.38[1]	20.9[1]	-	-	-
MW10-7B deep probe	10-Mar-11	1.96-2.74	1400	0.5	0	0	-	0	20.9	-	-	-
	7-Nov-12		1000	0.4	0	75	0	1.0	19.5	-	-	-
	24-Apr-13		1000	0.5	0	0	-	0.32[1]	20.9[1]	-	-	-
MW10-7B shallow probe	10-Mar-11	1.22-1.68	1300	NR	0	0	-	0	20.9	510000	250	0.05
	8-Nov-12		1000	0.3	0	45	0	0.9	19.9	-	-	-
MW10-7B well	10-Mar-11	3.17	-	-	-	-	-	-	-	-	-	-
	8-Nov-12	3.3-3.41	1000	0.1	0	65	0.1	1.4	19.8	-	-	-
MW10-9B well	11-Mar-11	3.3-3.4	1100	0.6	0	30	-	0	20.9	-	-	-
	8-Nov-12	3.3-3.6	1000	0.8	0	25	0.1	0.1	20.5	-	-	-
MW10-9B shallow probe	11-Mar-11	1.37-1.83	1300	<0.1	0	55	-	0.1	20.9	420000	235	0.06
	8-Nov-12		1000	0.9	0	50	0	0.6	19.7	-	-	-
MW10-9B deep probe	11-Mar-11	2.29-2.74	-	-	-	-	-	-	-	-	-	-
	8-Nov-12		-	-	-	-	-	-	-	-	-	-
MW10-10 well	8-Mar-11	2.74-3.3	1300	0.4	0	40	-	0.1	20.9	380000	3750	0.99
	8-Nov-12	2.74-3.46	1000	0.2	0	55	0	1.6	18.8	-	-	-
MW10-11 well	8-Mar-11	2.13-3.1	1500	1.2	0	230	-	0.7	20.7	420000	200	0.05
	8-Nov-12	2.13-3.27	1000	0.1	0	85	0.1	2.4	19.2	-	-	-
	24-Apr-13	2.13-2.97	1100	0.4	0	0	-	0.73[1]	19.8[1]	-	-	-
MW10-11 deep probe	8-Mar-11	1.22-1.52	1500	3.1	0	145	-	0.1	20.9	200	0	0.00
	8-Nov-12		1000	0.3	0	70	0	1.2	19.6	-	-	-
MW10-12 well	11-Mar-11	3.05-4.57	1500	3.2	0	80	0	0	20.9	380000	7300	1.92
	8-Nov-12	3.05-3.9	1000	0.1	0	40	0	0.7	20	-	-	-
MW10-14 well	9-Mar-11	2.13-4.27	1550	10.5	0	30	-	0.6	20.2	400000	9500	2.38
	2-Nov-12	blocked at 1.73 mbgs										
MW10-15 well	9-Mar-11	2.13-2.85	1600	0.4	0	270	-	0.7	20.4	430000	825	0.19
	2-Nov-12	2.13-3.52	1000	0.2	0	115	0	3.3	17.5	-	-	-
	25-Apr-13	2.13-3.37	1500	0.3	0	0	-	0.9[1]	18.9[1]	-	-	-
MW10-16 deep probe	10-Mar-11	1.22-1.52	1500	<0.1	0	35	-	0.1	20.9	380000	0	0.00
	7-Nov-12		1000	0.4	0	95	0	1.2	19.6	-	-	-
MW10-16 well	10-Mar-11	2.13-3.3	1500	0.5	0	60	-	0.2	20.9	-	-	-
	7-Nov-12	2.13-3.51	1000	0.1	0	105	-	1.7	19.5	-	-	-
	24-Apr-13	2.13-2.99	1500	0.6	0	0	-	0.38[1]	20.7[1]	-	-	-
MW10-18 deep probe	10-Mar-11	1.07-1.52	1400	<0.1	0	175	-	0	20.9	-	-	-
	8-Nov-12		1000	0.3	0	10	0	0.3	19.7	-	-	-
MW10-18 well	10-Mar-11	2.13-3.2	1400	NR	0	90	-	0	20.9	410000	275	0.07
	8-Nov-12	2.13-3.51	1000	0.1	0	5	0	0	19.9	-	-	-
MW10-20 well	11-Mar-11	2.13-3.0	1500	NR	0	270	0	0.1	20.9	470000	0	0.00
	8-Nov-12	2.13-3.27	1000	0.1	0	45	0	1.1	19.3	-	-	-
MW10-22 well	9-Mar-11	2.13-3.3	1500	7.8	0	185	-	0.4	19.8	320000	0	0.00
	8-Nov-12	2.13-3.35	1000	0.1	0	25	0	7.5	12.7	-	-	-
MW11-01 B shallow probe	5-Nov-12	1.21-1.82	1000	5	0	55	0	0.9	20.1	310000	0	0.00
MW11-01 B deep probe	5-Nov-12	2.13-2.74	1000	0.6	0	75	0	2.0	19.5	400000	0	0.00
MW11-02 shallow probe	6-Nov-12	1.07-1.68	1000	0.3	0	75	0	0.4	20.1	300000	50	0.02
MW11-02 deep probe	6-Nov-12	2.13-2.74	1000	0.4	0	75	0.2	0.6	20	300000	1125	0.38
MW11-03 B shallow probe	6-Nov-12	0.91-1.68	1000	0.4	0	100	-	0.6	19.7	300000	350	0.12
MW11-03 B deep probe	6-Nov-12	2.13-2.74	1000	0.4	0	105	-	2.3	19.4	300000	775	0.26
MW11-04 A well	5-Nov-12	2.34-3.57	1000	0.2	0	130	0	1.3	20.2	300000	0	0.00
MW11-04 B shallow probe	6-Nov-12	1.07-1.68	1000	0.3	0	120	0	2.0	19.8	300000	0	0.00
MW11-04 B deep probe	6-Nov-12	1.98-2.44	1000	0.4	0	115	0	2.0	19.8	350000	25	0.01
MW11-07 well	7-Nov-12	1.98-3.91	1000	0.1	0	95	0	2.3	19.5	300000	0	0.00
MW11-08 shallow probe	7-Nov-12	1.22-1.83	1000	0.4	0	150	0	3.5	18.7	300000	0	0.00
MW11-08 deep probe	7-Nov-12	2.13-2.59	1000	0.3	0	155	0	4.6	17.2	300000	0	0.00
MW11-09 shallow probe	7-Nov-12	1.22-1.83	1000	0.4	0	135	0	4.6	17.8	300000	0	0.00
MW11-09 deep probe	7-Nov-12	2.13-2.44	1000	1.7	0	125	0.2	6.5	16.5	300000	0	0.00

Notes:

mbgs - metres below ground surface.

PID - photoionization detector

NR = No Reading

1. RKI 2 multi-gas detector was used.

2. Percent leakage for the Helium tracer testing was calculated as 100 times the concentration in soil gas probe divided by concentration in shroud.

3. Soil gas readings at end of purging process.

4. For wells, the base of screened interval is water table.

* - Readings from Gem 2000. CH_4 measured using infrared detector.

Indicates sample could not be collected due to excessive vacuum (possibly within capillary fringe or below water table).

Table 2: Field Soil Vapour Purging Results
Canada Creosote Site - North Bow
Screening Level Risk Assessment Update

Well ID	2011 Field Results[1]						2012 Field Results[2]					2013 Field Results[3]			
	Purge Volume	Combustible Gas (ppm)	CO_2 (%)	O_2 (%)	PID (ppm)	CH_4 (%LEL)	Combustible Gas (ppm)	CO_2 (%)	O_2 (%)	PID (ppm)	CH_4 (%)	Combustible Gas (ppm)	CO_2 (%)	O_2 (%)	PID (ppm)
MW10-1 well	1	560	0.2	20.9	0	-	70	1.4	20.0	0	0	Not Assessed			
	2	290	0.2	20.9	0	-	70	1.4	20.1	0	0				
	3	220	0.2	20.7	0	-	75	1.4	20.0	0	0				
MW10-1 probe	1	110	0.2	20.9	0	-	80	1.2	20.3	0	0	Not Assessed			
	2	75	0.2	20.7	0	-	85	1.1	20.3	0	0				
	3	75	0.2	20.3	0	-	80	1.1	20.4	0	0				
MW10-2 well	1	60	0.7	19.2	0	-	80	1.1	19.9	0	0	Not Assessed			
	2	170	0.7	20.2	0	-	65	1.4	19.8	0	0				
	3	155	0.7	20.4	0	-	70	1.3	19.9	0	0				
MW10-3B shallow probe	1	220	0.7	20.7	0	-	95	1.6	19.8	0	0	Not Assessed			
	2	230	0.7	20.5	0	-	95	1.6	19.8	0	0				
	3	240	0.7	20.5	0	-	90	1.7	19.8	0	0				
MW10-3B deep probe	1	140	0.9	20.1	0	-	115	2.7	19.2	0	0	Not Assessed			
	2	180	0.9	20.1	0	-	115	2.7	19.1	0	0				
	3	200	0.9	20.1	0	-	110	2.6	19.2	0	0				
MW10-3B well	1	260	1	19.2	0	-	105	4.0	17.7	0	0	Not Assessed			
	2	390	1.1	19.3	0	-	105	3.8	17.6	0	0				
	3	420	1.1	19.3	0	-	110	4.0	17.7	0	0				
MW10-5 probe	1	0	0.1	20.9	0	-	150	0.6	20.4	0	0	Not Assessed			
	2	0	0.1	20.9	0	-	120	0.9	20.3	0	0				
	3	0	0.1	20.9	0	-	125	1.0	20.4	0	0				
MW10-5 well	1	0	0.4	20.9	0	-	10	2.8	19.5	0	0	Not Assessed			
	2	0	0.3	20.9	0	-	95	2.6	19.8	0	0				
	3	0	0.4	20.9	0	-	95	1.7	19.9	0	0				
	-	-	-	-	-	-	95	1.9	19.9	0	0				
MW10-6 probe	1	85	0	20.9	0	-	95	2.1	19.6	0	0	Not Assessed			
	2	60	0.2	20.9	0	-	80	2.2	19.6	0	0				
	3	55	0.2	20.9	0	-	85	2.1	19.7	0	0				
MW10-6 well	1	2950	0.2	18.8	6	-	120	1.6	20.0	16	0	85	0.36	20.9	65
	2	730	0.3	20.5	4	-	170	1.3	20.1	34	0	100	0.38	20.9	74
	3	310	0.2	20.9	2	-	155	0.9	20.2	34	0	100	0.38	20.9	70.6
	4	150	0.3	20.9	2	-	-	-	-	-	-	100	0.38	20.9	70.9
	5	140	0.3	20.9	1	-	-	-	-	-	-	-	-	-	-
MW10-7B well	1	-	-	-	-	-	50	0.8	19.9	0	0	Not Assessed			
	2	-	-	-	-	-	55	1.2	19.8	0	0				
	3	-	-	-	-	-	65	1.4	19.8	0	0.1				
	4	-	-	-	-	-	65	1.4	19.8	0	0.2				
MW10-7B shallow probe	1	0	0	20.9	0	-	70	1.0	19.7	0	0	Not Assessed			
	2	0	0	20.9	0	-	35	0.8	19.8	0	0				
	3	0	0	20.9	0	-	50	0.9	19.9	0	0				
	4	-	-	-	-	-	45	0.9	19.9	0	0				
MW10-7B deep probe	1	0	0	20.9	0	-	180	1.0	19.6	0	0	0	0.32	20.9	0
	2	0	0	20.9	0	-	75	1.1	19.6	0	0	0	0.32	20.9	0
	3	0	0	20.9	0	-	75	1.0	19.5	0	0	0	0.32	20.9	0
MW10-9B well	1	30	0	20.9	0	-	30	0.1	20.3	0	0.1	Not Assessed			
	2	35	0	20.9	0	-	30	0.1	20.4	0	0.1				
	3	30	0	20.9	0	-	25	0.1	20.5	0	0.1				
MW10-9B shallow probe	1	30	0	20.9	0	-	75	0.8	19.4	0	0	Not Assessed			
	2	35	0	20.9	0	-	50	0.7	19.5	0	0				
	3	30	0	20.9	0	-	50	0.6	19.7	0	0				
MW10-10 well	1	0	0.1	20.9	0	-	115	1.3	18.9	0	0	Not Assessed			
	2	35	0.1	20.9	0	-	55	1.7	18.8	0	0				
	3	40	0.1	20.9	0	-	55	1.6	18.8	0	0				
MW10-11 well	1	250	0.8	20.6	0	-	95	2.4	19.4	0	0	0	0.68	20.0	0
	2	230	0.7	20.7	0	-	75	2.2	19.5	0	0	0	0.72	19.8	0
	3	230	0.7	20.7	0	-	85	2.4	19.2	0	0.1	0	0.73	19.8	0
MW10-11 probe	1	-	0.4	20.9	0	-	90	1.2	19.5	0	0	Not Assessed			
	2	130	0.2	20.9	0	-	15	1.2	19.4	0	0				
	3	145	0.1	20.9	0	-	55	1.2	19.5	0	0				
	4	-	-	-	-	-	70	1.2	19.5	0	0				
	5	-	-	-	-	-	70	1.2	19.6	0	0				
MW10-12 well	1	90	0	20.9	0	0	45	0.8	20.0	0	0	Not Assessed			
	2	80	0	20.9	0	0	35	0.7	20.0	0	0				
	3	80	0	20.9	0	0	40	0.7	20.0	0	0				
MW10-14 well	1	180	0.6	20.1	0	-	blocked at 1.73 meters					Not Assessed			
	2	90	0.5	20.2	0	-									
	3	80	0.6	20.2	0	-									
MW10-15 well	1	35	0.5	20.9	0	-	115	1.5	18.0	0	0	0	0.86	18.9	0.5
	2	270	0.6	20.6	0	-	110	2.0	18.0	0	0	0	0.88	18.9	0.5
	3	270	0.7	20.4	0	-	110	3.4	17.5	0	0	0	0.89	18.9	0
	4	-	-	-	-	-	115	3.3	17.5	0	0	0	0.90	18.9	0
MW10-16 well	1	55	0.1	20.9	0	-	-	1.4	19.6	0	-	0	0.38	20.7	0
	2	60	0.2	20.9	0	-	85	1.7	19.5	0	-	0	0.38	20.7	0
	3	60	0.2	20.9	0	-	105	1.5	19.4	0	-	0	0.38	20.7	0
	4	-	-	-	-	-	105	1.7	19.5	0	-	-	-	-	-
MW10-16 probe	1	15	0.2	20.9	0	-	95	1.2	19.7	0	0	Not Assessed			
	2	40	0.2	20.9	0	-	100	1.2	19.6	0	0				
	3	35	0.1	20.9	0	-	95	1.2	19.6	0	0				
MW10-18 probe	1	130	0.1	20.9	0	-	0	0.3	19.9	0	0	Not Assessed			
	2	140	0.1	20.9	0	-	10	0.3	19.8	0	0				
	3	175	0	20.9	0	-	0	0.2	19.7	0	0				
	4	175	0	20.9	0	-	10	0.2	19.7	0	0				
MW10-18 well	1	60	0	20.9	0	-	0	0.0	19.9	0	0	Not Assessed			
	2	80	0	20.9	0	-	15	0.0	19.9	0	0				
	3	90	0	20.9	0	-	5	0.0	19.9	0	0				
	4	-	-	-	-	-	5	0.0	19.9	0	0				
MW10-22 well	1	125	1.4	19	0	-	30	7.5	12.7	0	0	Not Assessed			
	2	195	0.9	19.1	0	-	30	7.6	12.6	0	0				
	3	185	0.4	19.8	0	-	25	7.5	12.7	0	0				
MW10-20 well	1	270	0.1	20.9	0	0	5	1.0	19.2	0	0	Not Assessed			
	2	270	0.1	20.9	0	0	45	1.0	19.2	0	0				
	3	270	0.1	20.9	0	0	54	1.1	19.3	0	0				

Well ID	2012 Field Results[2]					
	Purge Volume	Combustible Gas (ppm)	CO_2 (%)	O_2 (%)	PID (ppm)	CH_4 (%)
MW11-01 B shallow probe	1	65	0.5	20.8	0	0
	2	55	0.8	20.1	0	0
	3	55	0.9	20.1	0	0
VP11-01 B deep probe	1	70	2.1	19.6	0	0
	2	75	2.1	19.4	0	0
	3	75	2.0	19.5	0	0
VP11-02 shallow probe	1	35	0.4	19.9	0	0
	2	75	0.4	20.0	0	0
	3	75	0.4	20.1	0	0
VP11-02 deep probe	1	140	0.6	20.0	0	0.2
	2	75	0.6	20.0	0	0.1
	3	75	0.6	20.0	0	0.2
MW11-03 B shallow probe	1	95	0.7	19.6	0	-
	2	115	0.6	19.7	0	-
	3	100	0.6	19.7	0	-
VP11-03 B deep probe	1	115	2.3	19.3	0	-
	2	100	2.2	19.3	0	-
	3	105	2.3	19.4	0	-
mw11-04 A well	1	135	1.1	19.9	0	0
	2	155	1.2	20.1	0	0
	3	130	1.3	20.2	0	0
VP11-04 B shallow probe	1	115	1.9	19.8	0	0
	2	120	2.0	19.8	0	0
	3	120	2.0	19.8	0	0
VP11-04 B deep probe	1	105	1.7	19.8	0	0
	2	110	2.0	19.8	0	0
	3	115	2.0	19.8	0	0
mw11-07 well	1	95	2.2	19.2	0	0
	2	85	2.3	19.8	0	0
	3	95	2.3	19.5	0	0
VP11-08 shallow probe	1	125	3.8	18.1	0	0
	2	150	3.7	18.4	0	0
	3	150	3.5	18.7	0	0
VP11-08 deep probe	1	170	4.7	17.4	0	0
	2	155	4.2	17.5	0	0
	3	155	4.6	17.2	0	0
VP11-09 shallow probe	1	105	4.6	17.7	0	0
	2	135	4.7	17.4	0	0
	3	135	4.6	17.8	0	0
VP11-09 deep probe	1	130	6.5	16.5	0	0.2
	2	120	6.5	16.5	0	0.2
	3	125	6.5	16.5	0	0.2

Notes:
PID - photoionization detector with 10.6 eV lamp.
[1] - RKI 2 instrument used for all gas measurements.
[2] - RKI 2 instrument used for combustible gas, and PID measurements. GEM 2000 instrument used for CH_4, CO_2 and O_2.
[3] - RKI with CO_2, O_2 and separate PID used for all measurments.
All CH_4 measurements obtained using infrared detector.
A denotes deeper well, B denotes shallow well.
NA - Not Applicable

Table 3: Soil Vapour Analytical Results
Canada Creosote Site - North Bow
Screening Level Risk Assessment Update

Sample Location ID	MW10-1				MW10-2	MW10-3B						MW10-5			MW10-6						
LAB ID	R103247-01	AUC0212-03	R103247-02	2110724-01	R103247-03	R103247-04	2110724-03	R103247-05	2110724-04	R103247-06	2110724-02	R103247-07	R103247-08	2110724-05	R103247-09	AUC0212-04	2110724-06	AVK0120-01	3041469-05	AWD0187-04	AWD0187-05
SAMPLE METHOD	Well	Well	Deep probe	Deep probe	Well	Shallow probe	Shallow probe	Deep probe	Deep probe	Well	Well	Well	Deep probe	Deep probe	Deep probe	Well	Well	Well	Well	Well	Well
SAMPLE DEPTH (mbgs)	2.7-3.3	2.7-3.3	2.4-2.55	2.4-2.55	2.5-3.1	0.81-1.37	0.81-1.37	1.68-2.13	1.68-2.13	2.74-3.00	2.74-3.61	2.13-3.9	1.07-1.52	1.07-1.52	1.65-2.44	3.04-3.42	3.04-3.71	3.04-3.71	3.04-3.15	3.04-3.15	3.04-3.15
DATE SAMPLED	09-Mar-11	09-Mar-11	09-Mar-11	10-Nov-12	09-Mar-11	09-Mar-11	10-Nov-12	09-Mar-11	10-Nov-12	09-Mar-11	10-Nov-12	11-Mar-11	11-Mar-11	10-Nov-12	10-Mar-11	10-Mar-11	10-Nov-12	12-Nov-12	25-Apr-13	25-Apr-13	25-Apr-13
LABORATORY	CARO	Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	Test America	CARO	Test America	CARO	Test America	Test America (DUP)
MATRIX	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air
Benzene	3.7	14.6	5.8	0.95	0.68	2.9	0.89	3.7	0.99	2.3	1.3	0.59	0.53	2.3	2.4	1.21	1.8	ND	1.2	ND	ND
Ethylbenzene	0.47	5.82	2.8	<0.33	<0.31	5.5	<0.33	4	<0.33	7.8	0.47	5.3	9.5	<0.32	25	17.7	5.1	24	8600	7640	6850
Toluene	20	182	90	<3.3	3.7	21	<3.3	81	<3.3	69	4.7	360	280	<3.2	81	35.4	7.8	12.8	100	1040	903
Xylenes (total)	6	30.3	16	<1.6	5.2	39	<1.7	31	<1.7	46	2.8	33	49	<1.6	110	96.1	23	187	33000	28900	25400
nC6-nC10 (F1)	1200	-	1400	<330	710	1500	<330	1600	<330	2200	350	2500	1900	<320	2700	-	850	-	180000	-	-
nC10-nC16 (total) (F2)	840	-	1400	<330	580	4200	<330	5100	<330	3000	350	3600	3900	<320	8100	-	1300	-	310000	-	-
Naphthalene	<0.34	-	<0.32	<0.33	<0.31	<0.32	0.5	<0.34	<0.33	<0.33	20	2	<0.33	<0.32	58	30.7	190	10500	32000	29100	20500

Sample Location ID	MW10-7B				MW10-9B		MW10-10	MW10-11					MW10-12	MW10-14	MW10-15					MW10-16				
LAB ID	R103247-11	R103247-10	3041469-04	AWD0187-03	R103247-12	R103247-13	R103247-14	R103247-15	R103247-16	2110724-07	3041469-01	AWD0187-01	R103247-17	R103247-18	R103247-19	AUC0212-02	2110724-08	3041469-07	AWD0187-06	R103247-20	R103247-21	2110724-09	3041469-02	AWD0187-02
SAMPLE METHOD	Shallow probe	Deep probe	Deep Probe	Deep Probe	Well	Shallow probe	Well	Deep probe	Well	Well	Well	Well	Well	Well	Well	Well	Well	Well	Well	Deep probe	Well	Well	Well	Well
SAMPLE DEPTH (mbgs)	1.22-1.68	1.96-2.74	1.96-2.74	1.96-2.74	3.3-3.4	1.37-1.83	2.74-3.3	1.22-1.52	2.13-3.1	2.13-3.27	2.13-2.97	2.13-2.97	3.05-4.57	2.13-4.27	2.13-2.85	2.13-2.85	2.13-3.52	2.13-3.37	2.13-3.37	1.22-1.52	2.13-3.3	2.13-3.51	2.13-2.99	2.13-2.99
DATE SAMPLED	10-Mar-11	10-Mar-11	24-Apr-13	24-Apr-13	11-Mar-11	11-Mar-11	08-Mar-11	08-Mar-11	08-Mar-11	10-Nov-12	24-Apr-13	24-Apr-13	11-Mar-11	09-Mar-11	09-Mar-11	09-Mar-11	10-Nov-12	25-Apr-13	25-Apr-13	10-Mar-11	10-Mar-11	10-Nov-12	24-Apr-13	24-Apr-13
LABORATORY	CARO	CARO	CARO	Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	Test America	CARO	CARO	CARO	Test America	CARO	CARO	Test America	CARO	CARO	CARO	CARO	Test America
MATRIX	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air
Benzene	0.44	0.91	<0.67	ND	0.31	0.99	0.23	<0.24	0.78	0.65	<0.67	ND	<0.17	2.5	2.6	10.9	1.2	<0.65	ND	1	1.1	0.8	<0.89	ND
Ethylbenzene	25	22	0.43	ND	44	3.2	4.7	1.5	1.9	0.31	1	ND	<0.33	7.3	3.9	9.41	<0.34	1.4	1.08	1.9	31	0.47	1.2	ND
Toluene	78	140	14	23	610	66	16	32	43	65	<3.4	1.81	3.7	96	46	99.3	<3.4	4.9	5.98	13	47	15	<4.4	2.28
Xylenes (total)	130	110	2.6	ND	250	18	30	16	14	1.7	5.4	ND	4	50	27	53	<1.7	10	7.84	17	180	2.8	6.2	ND
nC6-nC10 (F1)	1000	1600	870	-	3700	760	740	1100	1100	370	540	-	400	1700	1800	-	<340	980	-	1000	2500	<300	1200	-
nC10-nC16 (total) (F2)	540	1300	1100	-	740	590	<470	580	1300	<310	610	-	<330	2000	2200	-	<340	2000	-	1100	1100	<300	1500	-
Naphthalene	12	45	<0.33	ND	0.64	<0.33	<0.47	<0.48	<0.46	46	<0.34	ND	<0.33	<0.33	1.3	0.923	33	2.7	2.14	0.77	0.64	0.47	0.58	ND

Sample Location ID	MW10-18		MW10-20	MW10-22			VP11-01B		VP11-02		VP11-03B		VP11-04B			VP11-08			VP11-09				
LAB ID	R103247-22	R103247-23	R103247-24	R103247-25	AUC0212-01	2110724-11	2110724-13	2110724-14	2110724-15	2110724-16	2110724-17	2110724-18	2110724-19	2110724-20	2110724-21	2110724-22	2110724-23	AVK0120-03	2110724-24	2110724-25	AVK0120-02	2110724-26
SAMPLE METHOD	Well	Deep probe	Well	Well	Well	Well	Shallow probe	Deep probe	Shallow probe	Deep probe	Shallow probe	Deep probe	Shallow probe	Deep probe	Deep probe	Shallow probe	Deep probe	Deep probe	Shallow probe	Shallow probe	Shallow probe	Deep probe
SAMPLE DEPTH (mbgs)	2.13-3.2	1.07-1.52	2.13-3.0	2.13-3.3	2.13-3.3	2.13-3.35	1.22-1.82	2.13-2.74	1.07-1.68	2.13-2.74	0.91-1.68	2.13-2.74	1.07-1.68	1.98-2.44	1.98-2.44	1.22-1.83	2.13-2.59	2.13-2.59	1.22-1.83	1.22-1.83	1.22-1.83	2.13-2.74
DATE SAMPLED	10-Mar-11	10-Mar-11	11-Mar-11	09-Mar-11	09-Mar-11	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12	12-Nov-12	9-Nov-12	9-Nov-12	12-Nov-12	9-Nov-12
LABORATORY	CARO	CARO	CARO	CARO	Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO (DUP)	CARO	CARO	Test America	CARO	CARO (DUP)	Test America	CARO
MATRIX	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air
Benzene	0.23	0.54	0.2	1.7	2.49	0.78	1.5	1.6	1.8	1.7	3.9	7.6	1.6	1.2	1.1	1.2	0.93	0.404	1.1	1.4	1.82	1.4
Ethylbenzene	0.78	22	7	3.3	8	0.58	0.51	0.87	<0.34	0.4	<0.33	2.3	0.34	<0.3	0.56	0.47	<0.32	ND	0.65	0.66	0.56	0.46
Toluene	<3.3	5	54	110	70.8	8.6	<3.2	3.7	8.7	47	120	140	18	3.2	20	92	48	455	19	4	702	130
Xylenes (total)	7.5	100	44	22	38.6	3.5	2.8	3.2	<1.7	<1.7	<1.6	25	1.7	1.6	3	2.4	<1.6	ND	3.3	2.2	1.9	2.4
nC6-nC10 (F1)	520	1100	1000	1600	-	290	<320	<330	<340	370	490	1400	<310	<290	<330	470	350	-	<330	360	-	490
nC10-nC16 (total) (F2)	360	370	540	1200	-	<290	<320	<330	<340	<330	<330	<330	<310	<290	<330	<320	<320	-	<330	<330	-	<330
Naphthalene	<0.33	<0.34	2.7	<0.33	1.14	0.4	1.8	0.43	<0.34	<0.33	<0.33	<0.33	<0.31	0.3	<0.33	0.32	<0.32	2.08	<0.33	0.46	1.64	<0.33

Notes:
A denotes deeper well, B denotes shallow well.
All units in µg/m^3, unless otherwise noted.
mbgs - metres below ground surface.
ND - non-detect.
DUP - duplicate sample
2110724-01 Indicates sample results may be negatively biased

Table 4: Results of Soil Vapour Quality Control Analysis
Canada Cresote Site - North Bow
Screening Level Risk Assessment Update

Sample Name		MW10-16A	MW10-16B		MW10-22 A	MW10-22 B		MW10-16A	MW10-16B	
Location	Reporting	MW10-16 well	MW10-16 well	Percent	MW10-22 well	MW10-22 well	Percent	MW10-16 well	MW10-16 well	Percent
Date	Detection	9-Nov-12	9-Nov-12	Ratio*	9-Nov-12	9-Nov-12	Ratio*	24-Apr-13	24-Apr-13	Ratio*
QA/QC	Limit	first tube in series	second tube in series	Tube	first tube in series	second tube in series	Tube	first tube in series	second tube in series	Tube
Hydrocarbons										
nC6-nC8 (total)	140	<150	<150	NA	<140	<140	NA	<220	<220	NA
nC6-nC8 (aromatic)	2.9	15	<3	NA	9.5	<2.9	NA	<4.4	<4.4	NA
nC6-nC8 (aliphatic)	140	<150	<150	NA	<140	<140	NA	<220	<220	NA
nC8-nC10 (total)	140	<150	<150	NA	170	<140	NA	1000	760	**76.0**
nC8-nC10 (aromatic)	2.9	5	<3	NA	6	3.5	**58.3**	9.8	<4.4	NA
nC8-nC10 (aliphatic)	140	<150	<150	NA	150	<140	NA	1000	760	**76.0**
nC6-nC10 (F1)	290	<300	<300	NA	290	<290	NA	1200	890	**74.2**
nC10-nC12 (total)	140	240	<150	NA	260	<140	NA	1100	760	**69.1**
nC10-nC12 (aromatic)	2.9	<3	<3	NA	<2.9	<2.9	NA	<4.4	<4.4	NA
nC10-nC12 (aliphatic)	140	240	<150	NA	260	<140	NA	1100	760	**69.1**
nC12-nC16 (total)	290	<300	<300	NA	<290	<290	NA	<440	<440	NA
nC12-nC16 (aromatic)	2.9	<3	<3	NA	<2.9	<2.9	NA	<4.4	<4.4	NA
nC12-nC16 (aliphatic)	290	<300	<300	NA	<290	<290	NA	<440	<440	NA
nC10-nC16 (total) (F2)	290	<300	<300	NA	<290	<290	NA	1500	1100	**73.3**
VHv (6-13)	570	<590	<590	NA	<570	<570	NA	2200	1600	**72.7**
VPHv	570	<590	<590	NA	<570	<570	NA	2200	1600	**72.7**
Volatile Organic Compounds										
1,1,1,2-Tetrachloroethane	0.14	2.3	<0.15	NA	1.2	<0.14	NA	<0.44	<0.44	NA
1,1,1-Trichloroethane	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
1,1,2,2-Tetrachloroethane	0.14	<0.15	<0.15	NA	<0.14	<0.14	NA	<0.31	<0.31	NA
1,1,2-Trichloroethane	0.14	<0.15	<0.15	NA	<0.14	<0.14	NA	<0.44	<0.44	NA
1,1-Dichloroethane	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
1,1-Dichloroethene	0.086	<0.089	<0.089	NA	<0.086	<0.086	NA	<0.44	<0.44	NA
1,2,3-Trichloropropane	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
1,2,4-Trichlorobenzene	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
1,2,4-Trimethylbenzene	0.58	1.8	1	**55.6**	2.1	1.3	**61.9**	2.5	1.3	**52.0**
1,2-Dibromo-3-chloropropane	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
1,2-Dibromoethane	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
1,2-Dichlorobenzene	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
1,2-Dichloroethane	0.086	<0.089	<0.089	NA	<0.086	<0.086	NA	<0.27	<0.27	NA
1,2-Dichloropropane	0.14	<0.15	<0.15	NA	<0.14	<0.14	NA	<0.44	<0.44	NA
1,3,5-Trimethylbenzene	0.58	<0.59	<0.59	NA	<0.58	<0.58	NA	<0.89	<0.89	NA
1,3-Dichlorobenzene	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
1,3-Dichloropropane	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
1,3-Dichloropropene (cis+trans)	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.89	<0.89	NA
1,4-Dichlorobenzene	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
2-Butanone (MEK)	0.58	<0.59	<0.59	NA	<0.58	<0.58	NA	<2.2	<2.2	NA
2-Chlorotoluene	0.58	<0.59	<0.59	NA	<0.58	<0.58	NA	<0.89	<0.89	NA
4-Methyl-2-Pentanone (MIBK)	0.58	<0.59	<0.59	NA	<0.58	<0.58	NA	<0.89	<0.89	NA
Acetone	2.9	3.3	<3	NA	<2.9	3.2	NA	<4.4	<4.4	NA
Acrylonitrile	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Allyl chloride	0.14	<0.15	<0.15	NA	<0.14	<0.14	NA	<0.44	<0.44	NA
Benzene	0.14	0.8	0.53	**66.3**	0.78	0.63	**80.8**	<0.89	<0.89	NA
Bromobenzene	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Bromodichloromethane	0.14	<0.15	<0.15	NA	<0.14	<0.14	NA	<0.44	<0.44	NA
Bromoform	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Carbon disulfide	0.58	<0.59	<0.59	NA	<0.58	<0.58	NA	<4.4	<4.4	NA
Carbon tetrachloride	0.086	<0.089	<0.089	NA	<0.086	<0.086	NA	<0.44	<0.44	NA
Chlorobenzene	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Chloroethane	1.4	<1.5	<1.5	NA	<1.4	<1.4	NA	<2.2	<2.2	NA
Chloroform	0.14	0.15	<0.15	NA	<0.14	<0.14	NA	1.2	<0.44	NA
cis-1,2-Dichloroethene	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Dibromochloromethane	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Dibromomethane	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Dichlorodifluoromethane	0.58	4.4	<0.59	NA	4.9	<0.58	NA	4.4	<0.89	NA
Ethyl acetate	1.4	<1.5	<1.5	NA	<1.4	<1.4	NA	<2.2	<2.2	NA
Ethyl ether	0.58	<0.59	<0.59	NA	<0.58	<0.58	NA	<0.89	<0.89	NA
Ethyl methacrylate	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Ethylbenzene	0.29	0.47	<0.3	NA	0.58	0.43	**74.1**	1.2	0.53	**44.2**
Hexachlorobutadiene	0.14	<0.15	<0.15	NA	<0.14	<0.14	NA	<0.44	<0.44	NA
Hexachloroethane	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<1.8	<1.8	NA
Isobutylbenzene	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	-	-	-
Methacrylonitrile	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Methyl acrylate	1.4	<1.5	<1.5	NA	<1.4	<1.4	NA	<2.2	<2.2	NA
Methyl methacrylate	0.58	<0.59	<0.59	NA	<0.58	<0.58	NA	<0.89	<0.89	NA
Methyl tert-butyl ether	0.58	<0.59	<0.59	NA	<0.58	<0.58	NA	<0.89	<0.89	NA
Methylcyclohexane	0.58	<0.59	<0.59	NA	<0.58	<0.58	NA	<0.89	<0.89	NA
Methylene chloride	2.9	<3	<3	NA	<2.9	<2.9	NA	<4.4	<4.4	NA
Naphthalene	0.29	0.47	<0.3	NA	0.4	0.52	**130.0**	0.58	<0.44	NA
n-Decane	0.86	2.2	<1.8	NA	2.6	<1.7	NA	2.8	1.7	**60.7**
n-Hexane	2.9	<3	<3	NA	<2.9	<2.9	NA	<4.4	<4.4	NA
Nitrobenzene	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Styrene	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Tetrachloroethene	1.4	2.3	<1.5	NA	<1.4	<1.4	NA	4.9	<2.2	NA
Tetrahydrofuran	0.29	<0.3	<0.3	NA	0.32	<0.29	NA	<0.44	<0.44	NA
Toluene	2.9	15	<3	NA	8.6	<2.9	NA	<4.4	<4.4	NA
trans-1,2-Dichloroethene	0.29	<0.3	<0.3	NA	<0.29	<0.29	NA	<0.44	<0.44	NA
Trichloroethene	0.086	0.18	<0.089	NA	<0.086	<0.086	NA	0.22	<0.22	NA
Trichlorofluoromethane	0.29	0.92	<0.3	NA	1.1	<0.29	NA	0.98	<0.44	NA
Vinyl chloride	0.58	<0.59	<0.59	NA	<0.58	<0.58	NA	<0.89	<0.89	NA
Xylenes (total)	1.4	2.8	1.6	**57.1**	3.5	2.3	**65.7**	6.2	3.1	**50.0**

Sample Name		MW11-04B-DA	MW11-04B-DB				MW11-09-SA	MW11-09-SB			
Location	Reporting	MW11-04B deep probe	MW11-04B deep probe		Relative	Difference	MW11-09 shallow probe	MW11-09 shallow probe		Relative	Difference
Date	Detection	9-Nov-12	9-Nov-12	Mean	Percent	Factor	9-Nov-12	9-Nov-12	Mean	Percent	Factor
QA/QC	Limit	sorbent tube duplicates			Difference	(DF)	sorbent tube duplicates			Difference	(DF)
Hydrocarbons											
nC6-nC8 (total)	140	<150	160	NC	NC	NA	160	<170	NC	NC	NA
nC6-nC8 (aromatic)	2.9	4.7	21	13	NA	5.6	20	5.3	13	NA	5.1
nC6-nC8 (aliphatic)	140	<150	<160	NC	NC	NA	<160	<170	NC	NC	NA
nC8-nC10 (total)	140	<150	<160	NC	NC	NA	<160	200	NC	NC	NA
nC8-nC10 (aromatic)	2.9	<3	4.9	NC	NC	NA	5.6	4	4.8	NA	0.6
nC8-nC10 (aliphatic)	140	<150	<160	NC	NC	NA	<160	190	NC	NC	NA
nC6-nC10 (F1)	290	<290	<330	NC	NC	NA	<330	360	NC	NC	NA
nC10-nC12 (total)	140	<150	<160	NC	NC	NA	<160	<170	NC	NC	NA
nC10-nC12 (aromatic)	2.9	<3	<3.3	NC	NC	NA	<3.3	<3.3	NC	NC	NA
nC10-nC12 (aliphatic)	140	<150	<160	NC	NC	NA	<160	<170	NC	NC	NA
nC12-nC16 (total)	290	<290	<330	NC	NC	NA	<330	<330	NC	NC	NA
nC12-nC16 (aromatic)	2.9	<3	<3.3	NC	NC	NA	<3.3	<3.3	NC	NC	NA
nC12-nC16 (aliphatic)	290	<290	<330	NC	NC	NA	<330	<330	NC	NC	NA
nC10-nC16 (total) (F2)	290	<290	<330	NC	NC	NA	<330	<330	NC	NC	NA
VHv (6-13)	570	<590	<660	NC	NC	NA	<650	<660	NC	NC	NA
VPHv	570	<590	<660	NC	NC	NA	<650	<660	NC	NC	NA
Volatile Organic Compounds											
1,1,1,2-Tetrachloroethane	0.14	0.53	<0.16	NC	NC	NA	<0.16	<0.17	NC	NC	NA
1,1,1-Trichloroethane	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
1,1,2,2-Tetrachloroethane	0.14	<0.15	<0.16	NC	NC	NA	<0.16	<0.17	NC	NC	NA
1,1,2-Trichloroethane	0.14	<0.15	<0.16	NC	NC	NA	<0.16	<0.17	NC	NC	NA
1,1-Dichloroethane	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
1,1-Dichloroethene	0.086	0.21	0.2	0.2	NA	0.12	<0.098	0.1	NC	NC	NA
1,2,3-Trichloropropane	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
1,2,4-Trichlorobenzene	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
1,2,4-Trimethylbenzene	0.58	1	1.5	1.3	NA	0.86	1.5	1.6	1.6	NA	0.17
1,2-Dibromo-3-chloropropane	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
1,2-Dibromoethane	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
1,2-Dichlorobenzene	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
1,2-Dichloroethane	0.086	<0.089	<0.099	NC	NC	NA	<0.098	<0.1	NC	NC	NA
1,2-Dichloropropane	0.14	<0.15	<0.16	NC	NC	NA	<0.16	<0.17	NC	NC	NA
1,3,5-Trimethylbenzene	0.58	<0.59	<0.66	NC	NC	NA	<0.65	<0.66	NC	NC	NA
1,3-Dichlorobenzene	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
1,3-Dichloropropane	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
1,3-Dichloropropene (cis+trans)	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
1,4-Dichlorobenzene	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
2-Butanone (MEK)	0.58	<0.59	<0.66	NC	NC	NA	<0.65	<0.66	NC	NC	NA
2-Chlorotoluene	0.58	<0.59	<0.66	NC	NC	NA	<0.65	<0.66	NC	NC	NA
4-Methyl-2-Pentanone (MIBK)	0.58	<0.59	<0.66	NC	NC	NA	<0.65	<0.66	NC	NC	NA
Acetone	2.9	<3	<3.3	NC	NC	NA	<3.3	<3.3	NC	NC	NA
Acrylonitrile	0.29	<0.3	<0.33	NC	NC	NA	<0.49	<0.33	NC	NC	NA
Allyl chloride	0.14	<0.15	<0.16	NC	NC	NA	<0.16	<0.17	NC	NC	NA
Benzene	0.14	1.2	1.1	1.2	8.7%	NA	1.1	1.4	1.3	24.0%	NA
Bromobenzene	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Bromodichloromethane	0.14	<0.15	<0.16	NC	NC	NA	<0.16	<0.17	NC	NC	NA
Bromoform	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Carbon disulfide	0.58	0.86	<0.66	NC	NC	NA	0.88	1.1	1.0	NA	0.38
Carbon tetrachloride	0.086	8	<0.099	NC	NC	NA	<0.098	16	NC	NC	NA
Chlorobenzene	0.29	<0.3	<0.33	NC	NC	NA	<0.33	4.3	NC	NC	NA
Chloroethane	1.4	<1.5	<1.6	NC	NC	NA	<1.6	<1.7	NC	NC	NA
Chloroform	0.14	0.15	<0.16	NC	NC	NA	<0.16	0.23	NC	NC	NA
cis-1,2-Dichloroethene	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Dibromochloromethane	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Dibromomethane	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Dichlorodifluoromethane	0.58	6.2	4.6	5.4	29.6%	NA	4.3	7.3	5.8	**51.7%**	NA
Ethyl acetate	1.4	<1.5	<1.6	NC	NC	NA	<1.6	<1.7	NC	NC	NA
Ethyl ether	0.58	<0.59	<0.66	NC	NC	NA	<0.65	<0.66	NC	NC	NA
Ethyl methacrylate	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Ethylbenzene	0.29	<0.3	0.56	NC	NC	NA	0.65	0.66	0.7	NA	0.03
Hexachlorobutadiene	0.14	<0.15	<0.16	NC	NC	NA	<0.16	<0.17	NC	NC	NA
Hexachloroethane	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Isobutylbenzene	0.29	<0.3	<0.33	NC	NC	NA	<0.33	0.37	NC	NC	NA
Methacrylonitrile	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Methyl acrylate	1.4	<1.5	<1.6	NC	NC	NA	<1.6	<1.7	NC	NC	NA
Methyl methacrylate	0.58	<0.59	<0.66	NC	NC	NA	<0.65	<0.66	NC	NC	NA
Methyl tert-butyl ether	0.58	<0.59	<0.66	NC	NC	NA	<0.65	<0.66	NC	NC	NA
Methylcyclohexane	0.58	0.8	<0.66	NC	NC	NA	<0.65	<0.66	NC	NC	NA
Methylene chloride	2.9	<3	<3.3	NC	NC	NA	<3.3	<3.3	NC	NC	NA
Naphthalene	0.29	0.3	<0.33	NC	NC	NA	<0.33	0.46	NC	NC	NA
n-Decane	0.86	<1.8	<2	NC	NC	NA	2	<2	NC	NC	NA
n-Hexane	2.9	<3	<3.3	NC	NC	NA	<3.3	<3.3	NC	NC	NA
Nitrobenzene	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Styrene	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Tetrachloroethene	1.4	<1.5	<1.6	NC	NC	NA	<1.6	<1.7	NC	NC	NA
Tetrahydrofuran	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Toluene	2.9	3.2	20	11.6	NA	**5.8**	19	4	11.5	NA	**5.2**
trans-1,2-Dichloroethene	0.29	<0.3	<0.33	NC	NC	NA	<0.33	<0.33	NC	NC	NA
Trichloroethene	0.086	0.15	<0.099	NC	NC	NA	<0.098	<0.1	NC	NC	NA
Trichlorofluoromethane	0.29	1.9	0.99	1.4	NA	**3.1**	0.92	2	1.5	**74.0%**	NA
Vinyl chloride	0.58	<0.59	<0.66	NC	NC	NA	<0.65	<0.66	NC	NC	NA
Xylenes (total)	1.4	1.6	3	2.3	NA	1.00	3.3	2.2	2.8	NA	0.79

Table 4: Results of Soil Vapour Quality Control Analysis
Canada Cresote Site - North Bow
Screening Level Risk Assessment Update

Sample Name		MW10-16A	MW10-16B			
Location	Reporting Detection Limit	MW10-16 well	MW10-16 well	Mean	Relative Percent Difference	Difference Factor (DF)
Date		25-Apr-13	25-Apr-13			
QA/QC		SUMMA duplicates				
Volatile Organic Compounds						
1,1,1-Trichloroethane	2.02	ND	ND	NC	NC	NA
1,1,2,2-Tetrachloroethane	2.57	ND	ND	NC	NC	NA
1,1,2-Trichloroethane	2.02	ND	ND	NC	NC	NA
1,1,2-Trichlorotrifluoroethane	2.87	ND	ND	NC	NC	NA
1,1-Dichloroethane	1.51	ND	ND	NC	NC	NA
1,1-Dichloroethene	1.77	ND	ND	NC	NC	NA
1,2,3-Trimethylbenzene	3.59	2140	1590	1865.0	29.5%	NA
1,2,4-Trichlorobenzene	2.68	ND	ND	NC	NC	NA
1,2,4-Trimethylbenzene	30.1	10700	9270	9985	14.3%	NA
1,2-Dibromoethane (EDB)	2.88	ND	ND	NC	NC	NA
1,2-Dichloro-1,1,2,2-tetrafluoroethane	2.59	ND	ND	NC	NC	NA
1,2-Dichlorobenzene	2.23	ND	ND	NC	NC	NA
1,2-Dichloroethane	1.51	ND	ND	NC	NC	NA
1,2-Dichloropropane	1.73	ND	ND	NC	NC	NA
1,3,5-Trimethylbenzene	1.84	6470	5530	6000	15.7%	NA
1,3-Butadiene	0.726	ND	ND	NC	NC	NA
1,3-Dichlorobenzene	2.23	ND	ND	NC	NC	NA
1,3-Diethylbenzene	3.97	456	347	402	27.1%	NA
1,4-Dichlorobenzene	2.25	ND	ND	NC	NC	NA
1,4-Diethylbenzene	3.93	209	152	181	31.6%	NA
1,4-Dioxane	3.61	ND	ND	NC	NC	NA
1-Butene/Isobutene	0.931	ND	ND	NC	NC	NA
1-Decene	3.96	ND	ND	NC	NC	NA
1-Heptene	2.77	4.46	3.79	4	NA	0.2
1-Hexene	2.33	ND	ND	NC	NC	NA
1-Methylcyclohexene	1.52	ND	ND	NC	NC	NA
1-Methylcyclopentene	1.28	ND	ND	NC	NC	NA
1-Nonene	3.56	498	587	543	16.4%	NA
1-Octene	0.89	236	188	212	22.6%	NA
1-Pentene	0.969	ND	ND	NC	NC	NA
1-Undecene	2.26	ND	ND	NC	NC	NA
2 & 3-Chlorotoluene	3.89	ND	ND	NC	NC	NA
2,2,3-Trimethylpentane	1.73	ND	ND	NC	NC	NA
2,2,4-Trimethylpentane	1.75	ND	ND	NC	NC	NA
2,2,5-Trimethylhexane	2.02	ND	ND	NC	NC	NA
2,2-Dimethylbutane	1.24	ND	ND	NC	NC	NA
2,3,4-Trimethylpentane	1.21	ND	ND	NC	NC	NA
2,3-Dimethylbutane	0.914	ND	ND	NC	NC	NA
2,3-Dimethylpentane	1.55	ND	ND	NC	NC	NA
2,4,4-Trimethyl-1-pentene	1.7	ND	ND	NC	NC	NA
2,4,4-Trimethyl-2-pentene	1.77	ND	ND	NC	NC	NA
2,4-Dimethylpentane	1.53	ND	ND	NC	NC	NA
2,5-Dimethylhexane	1.73	3.62	2.78	3	NA	0.5
2-Butanone (MEK)	2.18	ND	ND	NC	NC	NA
2-Ethyl-1-butene	1.28	ND	ND	NC	NC	NA
2-Ethyltoluene	1.84	1270	998	1134	24.0%	NA
2-Hexanone	1.04	ND	ND	NC	NC	NA
2-Methyl-1-pentene	1.11	ND	ND	NC	NC	NA
2-Methyl-2-butene	0.847	ND	ND	NC	NC	NA
2-Methyl-2-pentene	1.25	ND	ND	NC	NC	NA
2-Methylheptane	1.75	466	347	407	29.3%	NA
3-Ethyltoluene	1.84	6790	5820	6305	15.4%	NA
3-Methyl-1-butene	0.911	ND	ND	NC	NC	NA
3-Methylheptane	3.38	193	157	175	20.6%	NA
3-Methylhexane	1.29	4.65	4.31	4	NA	0.3
3-Methylpentane	1.13	3.42	3.17	3	NA	0.2
4-Chlorotoluene	3.54	ND	ND	NC	NC	NA
4-Ethyltoluene	1.82	3910	3370	3640	14.8%	NA
4-Isopropyltoluene	3.94	2020	1580	1800	24.4%	NA
4-Methyl-1-pentene	0.935	ND	ND	NC	NC	NA
4-Methyl-2-Pentanone (MIBK)	3	ND	ND	NC	NC	NA
4-Nonene	0.757	ND	ND	NC	NC	NA
Acetaldehyde	2.34	ND	ND	NC	NC	NA
Acetone	0.761	5.11	4.54	5	11.8%	NA
Acetonitrile	0.715	ND	ND	NC	NC	NA
Acetylene	0.763	ND	ND	NC	NC	NA
Acrylonitrile	2.93	ND	ND	NC	NC	NA
Allyl chloride	1.15	ND	ND	NC	NC	NA
alpha-Pinene	2.11	13000	11200	12100	14.9%	NA
Benzaldehyde	1.75	ND	ND	NC	NC	NA
Benzene	0.902	ND	ND	NC	NC	NA
Benzyl chloride	6.92	ND	ND	NC	NC	NA
beta-Pinene	2.08	510	455	483	11.4%	NA
Bromochloromethane	2.04	ND	ND	NC	NC	NA
Bromodichloromethane	2.58	ND	ND	NC	NC	NA
Bromoform	3.98	ND	ND	NC	NC	NA
Bromomethane	1.45	ND	ND	NC	NC	NA
Butane	0.779	ND	ND	NC	NC	NA
Butyl acrylate	6.68	ND	ND	NC	NC	NA
Butyraldehyde	3.79	ND	ND	NC	NC	NA
Carbon disulfide	3.97	ND	ND	NC	NC	NA

Sample Name		MW10-16A	MW10-16B			
Location	Reporting Detection Limit	MW10-16 well	MW10-16 well	Mean	Relative Percent Difference	Difference Factor (DF)
Date		25-Apr-13	25-Apr-13			
QA/QC		SUMMA duplicates				
Volatile Organic Compounds						
Carbon tetrachloride	2.35	ND	ND	NC	NC	NA
Chlorobenzene	1.74	ND	ND	NC	NC	NA
Chlorodifluoromethane	2.46	ND	ND	NC	NC	NA
Chloroethane	0.701	ND	ND	NC	NC	NA
Chloroform	1.83	79.6	73.2	76	8.4%	NA
Chloromethane	0.628	ND	ND	NC	NC	NA
Chloroprene	0.964	ND	ND	NC	NC	NA
cis/trans-4-Methyl-2-pentene	2.6	ND	ND	NC	NC	NA
cis-1,2-Dichloroethene	1.48	ND	ND	NC	NC	NA
cis-1,3-Dichloropropene	1.7	ND	ND	NC	NC	NA
cis-2-Butene	0.819	ND	ND	NC	NC	NA
cis-2-Hexene	2.47	ND	ND	NC	NC	NA
cis-2-Octene	1.7	96.9	78.7	88	20.7%	NA
cis-2-Pentene	0.993	ND	ND	NC	NC	NA
cis-3-Heptene	0.628	ND	ND	NC	NC	NA
cis-3-Hexene	1.31	ND	ND	NC	NC	NA
cis-3-Methyl-2-pentene	1.28	ND	ND	NC	NC	NA
Cumene	-	1540	1240	1390	NC	NA
Cyclohexane	0.943	ND	ND	NC	NC	NA
Cyclohexene	0.575	ND	ND	NC	NC	NA
Cyclopentane	0.858	ND	ND	NC	NC	NA
Cyclopentene	0.817	ND	ND	NC	NC	NA
Dichlorodifluoromethane	1.83	ND	ND	NC	NC	NA
Dichlorofluoromethane	1.58	ND	ND	NC	NC	NA
Diethyl ether	2.05	ND	ND	NC	NC	NA
Ethane	0.434	2.06	2.43	2	16.5%	NA
Ethanol	2.45	ND	ND	NC	NC	NA
Ethene	0.516	1.55	2.1	2	NA	1.1
Ethylbenzene	1.62	7640	6850	7245	10.9%	NA
Halocarbon 134A	1.56	ND	ND	NC	NC	NA
Heptanal	5.95	ND	ND	NC	NC	NA
Heptane	1.06	18.6	18	18	3.3%	NA
Hexachlorobutadiene	4.02	ND	ND	NC	NC	NA
Hexanal	2.38	ND	ND	NC	NC	NA
Hexane	1.19	5.79	5.94	6	NA	0.1
Indan	30.5	14400	12300	13350	15.7%	NA
Indene	13.6	3640	3260	3450	11.0%	NA
Isobutane	0.903	ND	ND	NC	NC	NA
Isobutylbenzene	2.11	57.7	41	49	33.8%	NA
Isoheptane	1.53	4.74	3.89	4	NA	0.6
Isohexane	1.03	5.75	5.4	6	6.3%	NA
Isopentane	2.06	1.38	ND	NC	NC	NA
Isoprene	0.881	ND	ND	NC	NC	NA
Methanol	1.93	5.09	5.89	5	NA	0.4
Methyl tert-butyl ether	2.49	ND	ND	NC	NC	NA
Methylcyclohexane	1.5	24.5	21.7	23	12.1%	NA
Methylcyclopentane	0.953	ND	ND	NC	NC	NA
Methylene chloride	1.31	ND	ND	NC	NC	NA
m-Xylene & p-Xylene	3.25	20700	18200	19450	12.9%	NA
Naphthalene	51	29100	20500	24800	34.7%	NA
n-Butanol	3.81	ND	ND	NC	NC	NA
n-Butylbenzene	1.02	ND	ND	NC	NC	NA
n-Decane	2.18	2960	2080	2520	34.9%	NA
Neopentane	1.16	ND	ND	NC	NC	NA
n-Nonane	1.96	4500	3820	4160	16.3%	NA
n-Octane	1.77	3140	2770	2955	12.5%	NA
n-Pentane	1.1	ND	ND	NC	NC	NA
n-Propylbenzene	1.86	590	461	526	24.5%	NA
n-Undecane	1.27	1440	1080	1260	28.6%	NA
o-Xylene	1.62	8260	7230	7745	13.3%	NA
Propane	0.651	ND	ND	NC	NC	NA
Propanol	3.52	ND	ND	NC	NC	NA
Propylene	0.652	ND	ND	NC	NC	NA
Styrene	1.59	15.1	13.3	NC	NC	NA
tert-Butylbenzene	2.12	ND	ND	NC	NC	NA
Tetrachloroethene	2.54	25.9	22.5	24	14.0%	NA
Toluene	1.41	1040	903	972	14.1%	NA
trans-1,2-Dichloroethene	2.87	ND	ND	NC	NC	NA
trans-1,3-Dichloropropene	1.7	ND	ND	NC	NC	NA
trans-2-Butene	0.781	ND	ND	NC	NC	NA
trans-2-Heptene	0.746	ND	ND	NC	NC	NA
trans-2-Hexene	0.968	ND	ND	NC	NC	NA
trans-2-Pentene	1.3	ND	ND	NC	NC	NA
trans-3-Heptene	1.47	ND	ND	NC	NC	NA
Trichloroethene	2.01	ND	ND	NC	NC	NA
Trichlorofluoromethane	2.08	ND	ND	NC	NC	NA
Vinyl acetate	5.59	ND	ND	NC	NC	NA
Vinyl bromide	2.99	ND	ND	NC	NC	NA
Vinyl chloride	0.899	ND	ND	NC	NC	NA
Xylenes (total)	2.41	28900	25400	27150	12.9%	NA

Notes:

All concentrations in $\mu g/m^3$, unless otherwise noted.

NA = Not Applicable

NC = Not Calculated

*The ratio for samples in series is calculated by dividing the value from the second tube by the value from the first tube. Note that because the hydrocarbon fractions were relatively low and near to the detection limit, the concentration in the second tube is uncertain.

Bold values indicate percent ratio of >25%, relative percent difference of >50% or a difference factor of >2.

Table 5: Summary of Field Groundwater Monitoring Results
Canada Creosote Site - North Bow
Screening Level Risk Assessment Update

Sample ID	Date monitored	Temperature (°C)	pH	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Top of Casing Elevation (masl)	Ground Surface Elevation (masl)	Depth to Static Water Level (mbtoc)	Depth to Static Water Level (mbgs)	Depth to NAPL (mbtoc)	Total Depth (mbtoc)	Static Water Level Elevation (masl)
MW10-1	28-Feb-11	4.22	8.47	958	11.21	1050.849	1050.892	3.286	3.329	ND	4.15	1047.563
	30-Oct-12	8.57	8.50	870	nc			3.919	3.962	ND	4.21	1046.930
MW10-2	28-Feb-11	4.84	7.94	766	8.51	1050.597	1050.780	2.962	3.144	ND	4.50	1047.635
	30-Oct-12	nc	nc	nc	nc			3.650	3.832	ND	4.66	1046.947
MW10-3A	28-Feb-11	5.26	7.93	806	9.87	1050.645	1050.674	2.590	2.619	ND	6.99	1048.055
	30-Oct-12	nc	nc	nc	nc			3.875	3.904	ND	9.98	1046.770
MW10-3B	28-Feb-11	4.54	7.83	776	8.76	1050.430	1050.725	2.706	3.001	ND	3.66	1047.724
	30-Oct-12	nc	nc	nc	nc			3.607	3.902	ND	3.67	1046.823
MW10-5	28-Feb-11	DRY	DRY	DRY	DRY	1049.788	1049.930	3.774	3.917	DRY	3.78	1046.014
	30-Oct-12	nc	nc	nc	nc			3.235	3.378	ND	3.76	1046.553
MW10-6	28-Feb-11	4.13	7.61	644	4.51	1050.262	1050.452	3.229	3.419	3.228 (LNAPL)	4.29	1047.033
	30-Oct-12	nc	nc	nc	nc			4.278	4.468	3.712 (LNAPL)	4.28	1045.984
	25-Apr-13	nc	nc	nc	nc			3.149	3.149	3.845 (DNAPL)	4.28	1047.113
MW10-7A	28-Feb-11	3.88	6.52	410	8.85	1050.020	1050.008	2.839	2.827	ND	6.94	1047.181
	30-Oct-12	8.74	7.58	1132	2.89			3.370	3.358	ND	6.90	1046.650
MW10-7B	28-Feb-11	4.71	7.42	326	10.09	1049.898	1050.112	2.952	3.167	ND	5.66	1046.946
	30-Oct-12	nc	nc	nc	nc			3.409	3.624	ND	4.64	1046.489
MW10-9A	28-Feb-11	4.88	7.76	374	9.50	1049.817	1050.008	3.016	3.207	ND	7.33	1046.801
	30-Oct-12	nc	nc	nc	nc			2.801	2.992	ND	7.30	1047.016
MW10-9B	28-Feb-11	4.13	7.71	393	8.90	1049.907	1050.051	3.092	3.236	ND	4.61	1046.815
	30-Oct-12	nc	nc	nc	nc			2.507	2.651	ND	3.68	1047.400
MW10-10	28-Feb-11	4.44	7.54	593	9.19	1049.723	1049.939	3.089	3.305	ND	4.21	1046.634
	30-Oct-12	nc	nc	nc	nc			3.460	3.676	ND	4.26	1046.263
MW10-11	28-Feb-11	4.53	7.90	588	8.51	1049.464	1049.675	2.894	3.104	ND	3.93	1046.570
	30-Oct-12	nc	nc	nc	nc			3.273	3.483	ND	3.95	1046.191
MW10-12	28-Feb-11	DRY	DRY	DRY	DRY	1051.679	1051.888	DRY	DRY	DRY	4.02	DRY
	30-Oct-12	nc	nc	nc	nc			3.900	4.109	ND	4.00	1047.779
MW10-14	28-Feb-11	DRY	DRY	DRY	DRY	1050.353	1050.628	DRY	DRY	DRY	2.59	DRY
	30-Oct-12	blocked at 1.733 mbtoc						blocked at 1.733 mbtoc				
MW10-15	28-Feb-11	3.06	7.56	238	9.67	1050.314	1050.561	2.599	2.846	ND	4.14	1047.715
	30-Oct-12	nc	nc	nc	nc			3.522	3.769	ND	4.13	1046.792
MW10-16	28-Feb-11	3.78	7.07	401	10.05	1050.085	1050.405	2.984	3.304	ND	3.77	1047.101
	30-Oct-12	8.99	7.49	580	6.80			3.512	3.832	ND	3.88	1046.573
MW10-18	28-Feb-11	3.82	7.09	744	6.81	1049.937	1050.093	3.075	3.230	ND	4.01	1046.862
	30-Oct-12	9.30	7.30	1699	3.21			3.510	3.665	ND	4.03	1046.427
MW10-20	28-Feb-11	3.23	7.14	401	10.00	1049.851	1049.989	2.897	3.036	ND	4.00	1046.954
	30-Oct-12	nc	nc	nc	nc			3.271	3.410	ND	4.02	1046.580
MW10-22	28-Feb-11	4.01	7.26	402	9.58	1049.776	1050.107	2.940	3.271	ND	4.01	1046.836
	30-Oct-12	nc	nc	nc	nc			3.350	3.681	ND	4.03	1046.426
MW11-01A	30-Oct-12	9.49	7.54	1011	5.07	1050.299	1050.392	3.480	3.573	ND	7.04	1046.819
MW11-03A	30-Oct-12	8.25	7.99	1079	8.59	1050.087	1050.174	3.329	3.416	ND	8.24	1046.758
MW11-04A	30-Oct-12	9.06	7.43	1557	3.62	1050.308	1050.354	3.570	3.616	ND	4.55	1046.738
MW11-06	30-Oct-12	10.80	8.21	514	1.56	1050.754	1050.865	3.621	3.732	ND	7.64	1047.133
MW11-07	30-Oct-12	9.51	7.25	489	6.71	1050.637	1050.666	3.912	3.941	ND	4.37	1046.725
MW1-A*	30-Oct-12	9.60	7.93	555	5.67	1050.540	-	3.794	-	ND	7.27	1046.746
MW1-B*	30-Oct-12	nc	nc	nc	nc	1050.560	-	3.730	-	ND	7.14	1046.830
MW2-A*	30-Oct-12	9.89	7.26	753	7.89	1050.460	-	3.880	-	ND	5.45	1046.580
MW2-B*	30-Oct-12	8.29	8.43	508	7.71	1050.420	-	3.597	-	ND	9.54	1046.823
MW3-A*	30-Oct-12	11.82	7.25	846	4.02	1050.570	-	4.142	-	ND	5.70	1046.428
MW3-B*	30-Oct-12	nc	nc	nc	nc	1050.530	-	3.847	-	5.485 (DNAPL)	9.99	1046.683
MW4-A*	30-Oct-12	11.00	7.32	1256	3.79	1049.980	-	3.453	-	ND	5.66	1046.527
MW4-B*	30-Oct-12	8.32	8.28	563	3.01	1050.010	-	3.252	-	ND	11.47	1046.758
MW6-A*	30-Oct-12	nc	nc	nc	nc	1050.580	-	3.937	-	ND	5.69	`
MW6-B*	30-Oct-12	nc	nc	nc	nc	1050.510	-	3.649	-	8.818 (DNAPL)	9.54	1046.861

Notes:
mbtoc - metres below top of casing
mbgs - metres below ground surface
masl - metres above sea level
NAPL - non aqueous phase liquid
nc - information not collected.
ND - none detected
* - Well elevation data from Jacques Whitford report "Phase II Environmental Site Assessment, CBC Building, 1724 Westmount Blvd NW, Calgary, Alberta" dated July 26, 2006
Table to be read in conjunction with accompanying report.
A denotes deeper well, B denotes shallow well.

Table 6: Field Groundwater Monitoring at CBC and EMS Sites
Canada Creosote Site - North Bow
Screening Level Risk Assessment Update

Location	Well ID	Date	Depth to water (mbtoc)	Total Depth (mbtoc)	Combustible gas (ppm)	Organic vapour (ppm)	Notes
EMS	No well ID but in location of 07-01	12/6/2010	3.855	7.112	-	-	
		2/17/2011	3.41	7.055	-	-	
CBC	MW1-A	3/2/2011	3.101	7.273	75	0	
		5/9/2011	3.73	7.265	-	-	
		10/30/2012	3.794	7.271	95	0	
	MW1-B	3/2/2011	1.839	7.068	0	0	
		5/9/2011	3.705	6.325	-	-	
		10/30/2012	3.73	7.135	35	0	
	MW2-A	12/6/2010	3.762	5.45	-	-	
		2/17/2011	3.24	5.39	-	-	
		3/2/2011	3.282	5.454	0	0	
		10/30/2012	3.88	5.446	35	0	
	MW2-B	12/6/2010	3.442	9.54	-	-	
		2/17/2011	2.79	9.48	-	-	
		3/2/2011	2.833	9.56	135	6	
		10/30/2012	3.597	9.54	25	0	
	MW3-A	3/2/2011	Could not locate				
		5/9/2011	3.981	6.697	-	-	
		10/30/2012	4.142	5.698	35	0	
	MW3-B	3/2/2011	Could not locate				
		5/9/2011	5.213	-	-	-	Depth to DNAPL = 5.213
		10/30/2012	3.847	9.985	115	96	Depth to DNAPL = 5.485
	MW4-A	10/30/2012	3.453	5.664	75	0	
	MW4-B	10/30/2012	3.252	11.472	25	0	
	MW6-A	3/2/2011	3.428	5.704	135	0	
		5/9/2011	3.856	5.7	-	-	
		10/30/2012	3.937	5.689	75	0	
	MW6-B	3/2/2011	3.169	9.504	15	0	Depth to DNAPL = 4.485
		5/9/2011	3.745	-	-	-	Depth to DNAPL = 7.610
		10/30/2012	3.649	9.54	110	58	Depth to DNAPL = 8.818

Notes:

1. Gas concentrations in well headspace measured using RKI Eagle 2.

Organic vapour concentration measured using RKI Eagle 2 photoionization detector (PID) with 10.6 eV lamp.

2. mbtoc = depth below top of casing.

Table 7: Summary of Groundwater BTEX and PAH Results
Canada Creosote Site - North Bow
Screening Level Risk Assessment Update

Sample Name	Alberta Tier 1 Res/PrkInd most stringent of fine and coarse[A]	Alberta Tier 2 Res/PrkInd for coarse grained soil Vapour Inhalation Pathway	Alberta Tier 2 Res/PrkInd Drinking Water Pathway	MW10-1		MW10-10	MW10-11	MW10-15	MW10-16		MW10-18		MW10-2	MW10-20	MW10-22	MW10-3A	MW10-3B	MW10-6	DUP 2 (MW10-06)
Location																			
Date				3/1/2011	11/13/2012	3/1/2011	3/1/2011	3/1/2011	3/1/2011	11/13/2012	3/1/2011	11/13/2012	3/1/2011	3/1/2011	3/1/2011	3/1/2011	3/1/2011	3/1/2011	3/1/2011
QA/QC																			
BTEX																			
Benzene	0.005	0.14	0.005	0.0007	<0.00040	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.00040	< 0.0004	<0.00040	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Toluene	0.024	74	0.024	0.0011	0.00091	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.00040	< 0.0004	<0.00040	< 0.0004	0.0017	< 0.0004	0.0011	0.0006	0.0005	0.0005
Ethylbenzene	0.0024	16	0.0024	< 0.0004	<0.00040	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.00040	< 0.0004	<0.00040	< 0.0004	< 0.0004	< 0.0004	0.0005	0.0005	0.0019	0.002
Xylenes, Total	0.3	3.9	0.3	< 0.0008	<0.00080	0.0017	< 0.0008	< 0.0008	< 0.0008	<0.00080	< 0.0008	<0.00080	< 0.0008	0.0016	< 0.0008	0.0031	0.0028	0.0081	0.0085
F1 (C6-C10) - BTEX	0.81	0.81	2.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
F2 (C10-C16)	1.1	1.5	1.1	< 0.1	-	0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	3	3
PAH																			
2-Methylnaphthalene	0.47	0.6[B]	0.47[B]	0.00087	Insuficient Sample Volume	0.0026	0.00032	0.00022	0.0011	0.00023	0.0002	0.00015	0.00011	0.00019	0.00011	0.00025	0.00028	0.23	0.21
Acenaphthene	0.0058	NGR	1.4	0.00022		0.0014	< 0.00010	< 0.00010	0.00013	0.00014	0.00071	**0.0065**	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	**0.2**	**0.18**
Acenaphthylene	0.046	NG	NG	< 0.00010		< 0.00010	< 0.00010	< 0.00010	< 0.00010	<0.00010	< 0.00010	0.00015	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.0029	< 0.0050
Acridine	NG	NG	NG	< 0.00020		< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.00020	< 0.00020	<0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.010
Anthracene	0.000012	NGR	NGR	**0.000022**		**0.00027**	**0.000033**	**0.000015**	**0.000058**	**0.00007**	**0.000023**	**0.000048**	< 0.000010	**0.00003**	< 0.000010	**0.000021**	**0.00002**	**0.063**	**0.063**
B(a)P Equivalency	0.00001	NG	0.00001	< 0.00001		**0.00005**	**0.00006**	< 0.00001	**0.00006**	**0.000032**	**0.00004**	**0.000025**	< 0.00001	**0.00004**	< 0.00001	0.00001	0.00001	**0.012**	**0.011**
Benzo(a)anthracene	0.000018	NG	NG	< 0.0000085		**0.000058**	**0.000042**	< 0.0000085	**0.000054**	**0.000022**	**0.00003**	0.000013	< 0.0000085	**0.000026**	< 0.0000085	0.0000095	0.000014	**0.024**	**0.024**
Benzo(a)pyrene	0.000015	NG	NG	< 0.0000075		**0.000024**	**0.000038**	< 0.0000075	**0.000039**	**0.000021**	**0.000027**	**0.000016**	< 0.0000075	**0.000023**	< 0.0000075	< 0.0000075	< 0.0000075	**0.0065**	**0.006**
Benzo[b,j]fluoranthene	0.00048	NG	NG	< 0.0000085		0.000049	0.000048	< 0.0000085	0.00006	0.000025	0.000035	0.000023	< 0.0000085	0.000029	< 0.0000085	0.000014	0.000016	**0.01**	**0.0075**
Benzo[c]phenanthrene	NG	NG	NG	< 0.000050		< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.000050	< 0.000050	<0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.0043	< 0.0040
Benzo[e]pyrene	NG	NG	NG	< 0.000050		< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.000050	< 0.000050	<0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	0.0048	0.0036
Benzo[g,h,i]perylene	0.00017	NG	NG	< 0.0000085		0.000024	0.000031	< 0.0000085	0.000031	<0.000014 (2)	0.000019	0.000012	< 0.0000085	0.000023	< 0.0000085	0.00002	0.0000095	**0.002**	**0.0037**
Benzo[k]fluoranthene	0.00048	NG	NG	< 0.0000085		0.00002	0.000018	< 0.0000085	0.000025	0.000013	0.000015	<0.0000085	< 0.0000085	0.000014	< 0.0000085	< 0.0000085	< 0.0000085	**0.0032**	**0.004**
Chrysene	0.0014	NG	NG	0.00002		0.00011	0.000067	< 0.0000085	0.000094	0.000024	0.00005	0.000014	< 0.0000085	0.000051	< 0.0000085	0.000051	0.000045	**0.024**	**0.02**
Dibenz(a,h)anthracene	0.00026	NG	NG	< 0.0000075		0.0000078	0.0000085	< 0.0000075	< 0.0000075	<0.0000075	< 0.0000075	<0.0000075	< 0.0000075	< 0.0000075	< 0.0000075	< 0.0000075	< 0.0000075	**0.00081**	**0.0013**
Fluoranthene	0.00004	NGR	NGR	< 0.000040		**0.00066**	**0.00012**	< 0.000040	**0.00016**	**0.00011**	**0.000091**	**0.000046**	< 0.000040	**0.00011**	< 0.000040	**0.00018**	**0.00012**	**0.19**	**0.15**
Fluorene	0.003	NGR	0.94	0.000092		0.00081	0.00011	< 0.000050	0.00018	0.00016	0.0004	0.0011	< 0.000050	< 0.000050	< 0.000050	0.000055	0.000076	**0.15**	**0.14**
Indeno[1,2,3-cd]pyrene	0.00021	NG	NG	< 0.0000085		0.000018	0.000023	< 0.0000085	0.000025	<0.000018 (2)	0.000016	<0.0000085	< 0.0000085	0.000016	< 0.0000085	0.00001	< 0.0000085	**0.002**	**0.0035**
Naphthalene	0.0011	0.6	0.47	**0.02**		**0.092**	0.00031	0.00023	**0.0013**	0.00061	**0.0021**	**0.0086**	< 0.00010	0.00016	**0.0011**	0.00032	0.00027	0.77	0.68
Perylene	NG	NG	NG	< 0.000050		< 0.000050	< 0.000050	< 0.000050	< 0.000050	<0.000050	< 0.000050	<0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	0.0017	< 0.0025
Phenanthrene	0.0004	NG	NG	0.00031		**0.0025**	0.00039	0.00017	**0.00063**	**0.0005**	0.00028	0.00015	0.000098	0.00025	0.000067	0.0003	0.00033	**0.44**	**0.36**
Pyrene	0.000025	NGR	0.71	**0.000035**		**0.00056**	**0.00012**	< 0.000020	**0.00017**	**0.00011**	**0.000089**	**0.000047**	**0.000037**	**0.00012**	**0.000033**	**0.00027**	**0.00014**	**0.15**	**0.12**
Quinoline	NG	NG	NG	< 0.00020		< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.00020	< 0.00020	<0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.010

Sample Name	Alberta Tier 1 Res/PrkInd most stringent of fine and coarse[A]	Alberta Tier 2 Res/PrkInd for coarse grained soil Vapour Inhalation Pathway	Alberta Tier 2 Res/PrkInd Drinking Water Pathway	MW10-7A		MW10-7B	DUP 1 (MW10-7B)	MW10-9A	MW10-9B	MW11-01A	MW11-03A	MW11-04A	MW11-06	DUP 1 (MW11-06)	MW1A	MW2A	MW2B	MW3A	MW4A	MW4B
Location																				
Date				3/1/2011	11/13/2012	3/1/2011	3/1/2011	3/1/2011	3/1/2011	11/13/2012	11/13/2012	11/13/2012	11/13/2012	11/13/2012	11/12/2012	11/12/2012	11/12/2012	11/13/2012	11/12/2012	11/12/2012
QA/QC																				
BTEX																				
Benzene	0.005	0.14	0.005	**0.039**	**0.087**	< 0.0004	< 0.0004	< 0.0004	< 0.0004	**0.14**	<0.00040	<0.00040	**0.86**	**0.8**	**0.01**	<0.00040	**0.012**	<0.00040	<0.00040	<0.00040
Toluene	0.024	74	0.024	0.0083	0.012	< 0.0004	< 0.0004	0.0009	0.0015	**0.11**	<0.00040	<0.00040	**2.2**	**2**	**0.033**	<0.00040	**0.088**	<0.00040	<0.00040	<0.00040
Ethylbenzene	0.0024	16	0.0024	**0.081**	**0.18**	0.0013	0.0009	< 0.0004	< 0.0004	**0.28**	<0.00040	0.00073	**0.59**	**0.54**	**0.016**	<0.00040	**0.051**	<0.00040	<0.00040	<0.00040
Xylenes, Total	0.3	3.9	0.3	0.14	0.29	0.0052	0.0036	< 0.0008	< 0.0008	**0.68**	<0.00080	<0.00080	**2.5**	**2.4**	0.08	<0.00080	**0.49**	<0.00080	<0.00080	<0.00080
F1 (C6-C10) - BTEX	0.81	0.81	2.2	< 0.1	0.11	< 0.1	< 0.1	< 0.1	< 0.1	<10	<0.10	<0.10	<10	<10	<0.10	<0.10	0.42	<0.10	<0.10	<0.10
F2 (C10-C16)	1.1	1.5	1.1	**4.7**	**8.6**	0.6	1.2	< 0.1	< 0.1	24	<0.10	0.37	29*	30 *	1.8	<0.10	29	<0.10	<0.10	<0.10
PAH																				
2-Methylnaphthalene	NG	0.6[B]	0.47[B]	0.066	0.060 (1)	0.059	0.075	0.00015	0.00051	1.2	0.00018	<0.00010	1	0.84	0.041	<0.00010	1.6	<0.00010	<0.00010	0.00011
Acenaphthene	0.0058	NGR	1.4	**0.027**	**0.04**	**0.056**	**0.069**	< 0.00010	0.0003	**0.71**	0.0017	**0.043 (1)**	**0.32**	**0.24**	0.0083	<0.00010	**0.88**	0.0002	<0.00010	0.0008
Acenaphthylene	0.046	NG	NG	0.0016	0.0029	0.0024	0.0029	< 0.00010	< 0.00010	0.0360	<0.00010	0.0013	0.0260	0.0190	0.0012	<0.00010	**0.078**	<0.00010	<0.00010	<0.00010
Acridine	NG	NG	NG	< 0.00020	<0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.020	<0.00020	0.00033	<0.020	<0.020	<0.00020	<0.00020	<0.020	<0.00020	<0.00020	<0.00020
Anthracene	0.000012	NGR	NGR	**0.0025**	**0.00068**	**0.04**	**0.046**	**0.000036**	**0.00038**	**0.42**	**0.0009**	**0.01**	**0.061**	**0.043**	**0.00072**	<0.000010	**0.29**	**0.00003**	**0.000027**	**0.00021**
B(a)P Equivalency	0.00001	NG	0.00001	**0.00022**	**0.000068**	**0.026**	**0.026**	**0.00004**	**0.00066**	**0.0002**	**0.00029**	<0.000010	**0.0076**	**0.0051**	**0.00011**	<0.000010	**0.13**	**0.000025**	**0.000022**	**0.00046**
Benzo(a)anthracene	0.000018	NG	NG	**0.00055**	**0.00015**	**0.031**	**0.033**	**0.000041**	**0.00071**	**0.25**	**0.00038**	<0.0000085	**0.013**	**0.0088**	**0.00047**	<0.0000085	**0.14**	0.00001	0.000013	**0.00041**
Benzo(a)pyrene	0.000015	NG	NG	**0.00012**	**0.00004**	**0.017**	**0.016**	**0.000024**	**0.00043**	**0.13**	**0.00017**	<0.0000075	**0.0046**	**0.003**	**0.00075**	<0.0000075	**0.081**	**0.000016**	0.000014	**0.00032**
Benzo[b,j]fluoranthene	0.00048	NG	NG	0.00018	0.000055	**0.024**	**0.021**	0.000045	0.00061	**0.16**	0.00022	<0.0000085	**0.007**	**0.0045**	**0.00085**	<0.0000085	**0.11**	0.000019	0.000018	0.00038
Benzo[c]phenanthrene	NG	NG	NG	< 0.00015	<0.000050	< 0.0050	< 0.0050	< 0.000050	< 0.00010	0.029	0.000074	<0.000050	<0.0050	<0.0050	0.000071	<0.000050	0.017	<0.000050	<0.000050	0.000051
Benzo[e]pyrene	NG	NG	NG	0.0001	<0.000050	0.012	0.012	< 0.000050	0.00	0.087	0.00015	<0.000050	<0.0050	<0.0050	0.00059	<0.000050	0.058	<0.000050	<0.000050	0.00035
Benzo[g,h,i]perylene	0.00017	NG	NG	0.000044	0.000011	**0.0063**	**0.0064**	0.000018	0.00015	**0.055**	0.00011	<0.0000085	**0.0021**	**0.0013**	**0.00048**	<0.0000085	**0.045**	0.000021	0.00001	0.00011
Benzo[k]fluoranthene	0.00048	NG	NG	0.000066	0.000022	**0.0073**	**0.0071**	0.000014	0.0002	**0.066**	0.00008	<0.0000085	**0.0037**	**0.0025**	0.0003	<0.0000085	**0.042**	<0.0000085	<0.0000085	0.00014
Chrysene	0.0014	NG	NG	0.00062	0.00012	**0.033**	**0.033**	0.00007	0.00074	**0.12**	0.00021	<0.0000085	**0.011**	**0.0059**	0.00027	<0.0000085	**0.08**	<0.0000085	0.000015	0.00029
Dibenz(a,h)anthracene	0.00026	NG	NG	0.000011	<0.0000075	**0.0025**	**0.0024**	0.0000083	0.000056	**0.017**	0.000036	<0.0000075	<0.00075	<0.00075	0.00013	<0.0000075	**0.012**	<0.0000075	<0.0000075	0.000031
Fluoranthene	0.00004	NGR	NGR	**0.0056**	**0.0012**	**0.13**	**0.15**	**0.00012**	**0.0022**	**0.92**	**0.0029**	**0.0061**	**0.08**	**0.053**	**0.0022**	<0.000040	**0.65**	**0.000048**	**0.000076**	**0.0011**
Fluorene	0.003	NGR	0.94	**0.01**	**0.012**	**0.057**	**0.067**	0.000072	0.00028	**0.66**	0.0015	**0.038**	**0.23**	**0.16**	0.0024	<0.000050	**0.65**	0.000066	<0.000050	**0.00079**
Indeno[1,2,3-cd]pyrene	0.00021	NG	NG	0.000035	<0.0000085	**0.0064**	**0.0063**	0.000016	0.00015	**0.046**	0.00009	<0.0000085	**0.0016**	**0.001**	**0.0004**	<0.0000085	**0.038**	<0.000021 (2)	<0.0000085	0.000076
Naphthalene	0.0011	0.6	0.47	**2.6**	**3.8 (1)**	**0.13**	**0.2**	0.00015	0.0012	**6.4 (1)**	0.00049	**0.0016**	**15 (1)**	**11 (1)**	**0.89 (1)**	<0.00010	**13 (1)**	**0.0017**	<0.00010	**0.0018**
Perylene	NG	NG	NG	0.000093	<0.000050	0.0039	0.004	< 0.000050	0.000092	0.035	<0.000050	<0.000050	<0.0050	<0.0050	0.00017	<0.000050	0.026	<0.000050	<0.000050	0.000058
Phenanthrene	0.0004	NG	NG	**0.015**	**0.0052**	**0.21**	**0.27**	0.00023	0.0019	**1.8**	**0.005**	**0.013**	**0.36**	**0.25**	**0.0025**	<0.000050	**1.5**	0.000098	0.00013	**0.00066**
Pyrene	0.000025	NGR	0.71	**0.0049**	**0.00088**	**0.12**	**0.14**	**0.00015**	**0.002**	**0.66**	**0.0021**	**0.0034**	**0.06**	**0.04**	**0.003**	<0.000020	**0.48**	**0.000065**	**0.00013**	**0.001**
Quinoline	NG	NG	NG	< 0.00020	<0.0027 (2)	< 0.00020	< 0.00020	< 0.00020	< 0.00020	<0.025	<0.00020	<0.0017 (2)	0.62	0.64	**0.003**	<0.00020	<0.029	<0.00020	<0.00020	<0.00020

Notes:
All concentrations in mg/L unless otherwise noted.
[A] - Alberta Tier 1 Guidelines, Residential Land Use, Most Stringent Guideline of Either Fine or Coarse Grained Soil (AENV, 2010)
[B] - The guideline value is for naphthalene.
NG - No Guideline
NGR - No Guildeline Required (calculated value > solubility, or > 1,000,000 mg/L).
* - Detection limits raised due to dilution to bring analyte within the calibrated range.
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.
(3) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
Bold values indicate exceedance of the lowest guideline.
Values highlighted in yellow exceed the drinking water guideline.
Values highlighted in red exceed the vapour inhalation guideline and drinking water guideline.
Values highlighted in blue - detection limit exceeds lowest guideline.

Table 8: Summary of Groundwater VOCs Results
Canada Creosote Site - North Bow
Screening Level Risk Assessment Update

Sample Name	Tier 1 Res/PrkInd most stringent of fine and coarse	Alberta Tier 1 Res/PrkInd for coarse grained soil Vapour Inhalation Pathway	Alberta Tier 1 Res/PrkInd Drinking Water Pathway	MW10-1		MW10-3A	MW10-6	MW10-7A		MW10-7B	MW10-9B	MW10-16	MW10-18	MW11-01A	MW11-03A	MW11-04A	MW11-06	DUP 1 (MW11-06)	MW1A	MW2A	MW2B	MW3A	MW4A	MW4B
Location																								
Date				3/1/2011	11/13/2012	3/1/2011	3/1/2011	3/1/2011	11/13/2012	3/1/2011	3/1/2011	11/13/2012	11/13/2012	11/13/2012	11/13/2012	11/13/2012	11/13/2012	11/13/2012	11/12/2012	11/12/2012	11/12/2012	11/13/2012	11/12/2012	11/12/2012
QA/QC																								
1,1,1,2-Tetrachloroethane	NG	NG	NG	< 0.002	<0.0020	< 0.002	< 0.002	< 0.002	<0.0020	< 0.002	< 0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
1,1,1-Trichloroethane	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,2,2-Tetrachloroethane	NG	NG	NG	< 0.002	<0.0020	< 0.002	< 0.002	< 0.002	<0.0020	< 0.002	< 0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
1,1,2-Trichloroethane	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1-Dichloroethane	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1-Dichloroethene	0.014	0.039	0.014	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,3-Trichlorobenzene	0.008	0.032	0.014	< 0.001	<0.0010	< 0.001	< 0.001	< 0.001	<0.0010	< 0.001	< 0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,4-Trichlorobenzene	0.015	0.028	0.015	< 0.001	<0.0010	< 0.001	< 0.001	< 0.001	<0.0010	< 0.001	< 0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,4-Trimethylbenzene	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	0.013	0.025	0.11	0.0032	< 0.0005	<0.00050	<0.00050	0.17	<0.00050	<0.00050	0.27	0.29	0.019	<0.00050	0.16	<0.00050	<0.00050	<0.00050
1,2-Dibromoethane	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichlorobenzene	0.0007	5.4	0.003	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichloroethane	0.005	0.01	0.005	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichloropropane	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3,5-Trichlorobenzene	0.014	0.015	0.014	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3,5-Trimethylbenzene	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	0.014	< 0.0005	< 0.0005	<0.00050	<0.00050	0.064	<0.00050	<0.00050	0.11	0.12	0.0083	<0.00050	0.078	<0.00050	<0.00050	<0.00050
1,3-Dichlorobenzene	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,4-Dichlorobenzene	0.001	0.22	0.001	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromodichloromethane	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromoform	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromomethane	NG	NG	NG	< 0.002	<0.0020	< 0.002	< 0.002	< 0.002	<0.0020	< 0.002	< 0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Carbon Tetrachloride	0.00056	0.00056	0.005	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chlorobenzene	0.0013	0.014	0.03	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloroethane	NG	NG	NG	< 0.001	<0.0010	< 0.001	< 0.001	< 0.001	<0.0010	< 0.001	< 0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroform	0.0018	0.003	0.093	**0.0019**	<0.00050	**0.0027**	0.0006	**0.0051**	<0.00050	< 0.0005	**0.0041**	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloromethane	NG	NG	NG	< 0.002	<0.0020	< 0.002	< 0.002	< 0.002	<0.0020	< 0.002	< 0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
cis-1,2-Dichloroethene	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-1,3-Dichloropropene	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dibromochloromethane	0.19	1.1	0.19	< 0.001	<0.0010	< 0.001	< 0.001	< 0.001	<0.0010	< 0.001	< 0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dichloromethane	0.05	3.4	0.05	< 0.002	<0.0020	< 0.002	< 0.002	< 0.002	<0.0020	< 0.002	< 0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Methyl Methacrylate	0.47	0.84	0.47	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Methyl tert-Butyl Ether	0.015	0.34	0.015	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Styrene	0.072	4.3	2.8	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	0.00074	< 0.0005	< 0.0005	<0.00050	<0.00050	0.0022	<0.00050	<0.00050	**0.22**	**0.22**	0.0061	<0.00050	0.025	<0.00050	<0.00050	<0.00050
Tetrachloroethene	0.03	0.11	0.03	< 0.0005	<0.00050	0.0006	0.0015	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
trans-1,2-Dichloroethene	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
trans-1,3-Dichloropropene	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichloroethene	0.005	0.02	0.005	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichlorofluoromethane	NG	NG	NG	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Vinyl Chloride	0.0011	0.0011	0.002	< 0.0005	<0.00050	< 0.0005	< 0.0005	< 0.0005	<0.00050	< 0.0005	< 0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Notes:
All concentrations in mg/L unless otherwise noted.
NG - No Guideline
Bold values indicate exceedance of the lowest guideline.
Values highlighted in yellow exceed the vapour inhalation guideline.
Values highlighted in red exceed the vapour inhalation guideline and drinking water guideline.

Table 9
Results of Groundwater Quality Control Analysis
Canada Creosote Site - North Bow
Screening Level Risk Assessment Update

Sample Name	MW11-06	DUP 1			
Location	MW11-06	MW11-06	Reporting Detection Limit	Mean	Relative Percent Difference*
Date	11/13/2012	11/13/2012			
QA/QC		FD			
BTEX					
Benzene	0.86	0.8	0.0004	0.83	7%
Toluene	2.2	2	0.0004	2.10	10%
Ethylbenzene	0.59	0.54	0.0004	0.57	9%
Xylenes, Total	2.5	2.4	0.0008	2.45	4%
F1 (C6-C10) - BTEX	<10	<10	0.10	NC	NC
F2 (C10-C16)	29	30	0.20	29.50	3%
PAH					
2-Methylnaphthalene	1	0.84	0.010	0.92	17%
Acenaphthene	0.32	0.24	0.010	0.28	29%
Acenaphthylene	0.0260	0.0190	0.010	0.02	NC
Acridine	<0.020	<0.020	0.020	NC	NC
Anthracene	0.061	0.043	0.0010	0.05	35%
B(a)P Equivalency	0.00076	0.00051	0.010	0.00	NA
Benzo(a)anthracene	0.013	0.0088	0.00085	0.01	39%
Benzo(a)pyrene	0.0046	0.003	0.00075	0.00	42%
Benzo[b,j]fluoranthene	0.007	0.0045	0.00085	0.01	43%
Benzo[c]phenanthrene	<0.0050	<0.0050	0.0050	NC	NC
Benzo[e]pyrene	<0.0050	<0.0050	0.0050	NC	NC
Benzo[g,h,i]perylene	0.0021	0.0013	0.00085	0.00	NA
Benzo[k]fluoranthene	0.0037	0.0025	0.00085	0.00	NA
Chrysene	0.011	0.0059	0.00085	0.01	60%
Dibenz(a,h)anthracene	<0.00075	<0.00075	0.00075	NC	NC
Fluoranthene	0.08	0.053	0.0040	0.07	41%
Fluorene	0.23	0.16	0.0050	0.20	36%
Indeno[1,2,3-cd]pyrene	0.0016	0.001	0.00085	0.00	NA
Naphthalene	15	11	0.10	13.00	31%
Perylene	<0.0050	<0.0050	0.0050	NC	NC
Phenanthrene	0.36	0.25	0.0050	0.31	36%
Pyrene	0.06	0.04	0.0020	0.05	40%
Quinoline	0.62	0.64	0.00020	0.63	NC

Sample Name	MW11-06	DUP 1 (MW11-06)			
Location	MW11-06	MW11-06	Reporting Detection Limit	Mean	Relative Percent Difference*
Date	11/13/2012	11/13/2012			
QA/QC		FD			
1,1,1,2-Tetrachloroethane	<0.0020	<0.0020	0.0020	NC	NC
1,1,1-Trichloroethane	<0.00050	<0.00050	0.0005	NC	NC
1,1,2,2-Tetrachloroethane	<0.0020	<0.0020	0.0020	NC	NC
1,1,2-Trichloroethane	<0.00050	<0.00050	0.0005	NC	NC
1,1-Dichloroethane	<0.00050	<0.00050	0.0005	NC	NC
1,1-Dichloroethene	<0.00050	<0.00050	0.0005	NC	NC
1,2,3-Trichlorobenzene	<0.0010	<0.0010	0.0010	NC	NC
1,2,4-Trichlorobenzene	<0.0010	<0.0010	0.0010	NC	NC
1,2,4-Trimethylbenzene	0.27	0.29	0.0005	0.2800	7%
1,2-Dibromoethane	<0.00050	<0.00050	0.0005	NC	NC
1,2-Dichlorobenzene	<0.00050	<0.00050	0.0005	NC	NC
1,2-Dichloroethane	<0.00050	<0.00050	0.0005	NC	NC
1,2-Dichloropropane	<0.00050	<0.00050	0.0005	NC	NC
1,3,5-Trichlorobenzene	<0.00050	<0.00050	0.0005	NC	NC
1,3,5-Trimethylbenzene	0.11	0.12	0.0005	0.1150	9%
1,3-Dichlorobenzene	<0.00050	<0.00050	0.0005	NC	NC
1,4-Dichlorobenzene	<0.00050	<0.00050	0.0005	NC	NC
Bromodichloromethane	<0.00050	<0.00050	0.0005	NC	NC
Bromoform	<0.00050	<0.00050	0.0005	NC	NC
Bromomethane	<0.0020	<0.0020	0.0020	NC	NC
Carbon Tetrachloride	<0.00050	<0.00050	0.0005	NC	NC
Chlorobenzene	<0.00050	<0.00050	0.0005	NC	NC
Chloroethane	<0.0010	<0.0010	0.0010	NC	NC
Chloroform	<0.00050	<0.00050	0.0005	NC	NC
Chloromethane	<0.0020	<0.0020	0.0020	NC	NC
cis-1,2-Dichloroethene	<0.00050	<0.00050	0.0005	NC	NC
cis-1,3-Dichloropropene	<0.00050	<0.00050	0.0005	NC	NC
Dibromochloromethane	<0.0010	<0.0010	0.0010	NC	NC
Dichloromethane	<0.0020	<0.0020	0.0020	NC	NC
Methyl Methacrylate	<0.00050	<0.00050	0.0005	NC	NC
Methyl tert-Butyl Ether	<0.00050	<0.00050	0.0005	NC	NC
Styrene	0.22	0.22	0.0005	0.2200	0%
Tetrachloroethene	<0.00050	<0.00050	0.0005	NC	NC
trans-1,2-Dichloroethene	<0.00050	<0.00050	0.0005	NC	NC
trans-1,3-Dichloropropene	<0.00050	<0.00050	0.0005	NC	NC
Trichloroethene	<0.00050	<0.00050	0.0005	NC	NC
Trichlorofluoromethane	<0.00050	<0.00050	0.0005	NC	NC
Vinyl Chloride	<0.00050	<0.00050	0.0005	NC	NC

Notes:

All concentrations in mg/L unless otherwise noted.

FD = field duplicate

QA/QC = quality assurance/quality control

NC = Not Calculated

NA = Not Applicable

* Relative percent difference is only calculated for results that are greater than 5 times the reported detection limit.

Highlighted RPDs exceed the quality control objectives of 30 % for organic compounds.

Table 10: Summary of NAPL Characterization
Canada Creosote Site - North Bow
Screening Level Risk Assessment Update

Parameter	UNITS	RDL	MW10-6 WELL
Hydrocarbons			
F1 (C6-C10) - BTEX	mg/L	0.10	8.8
(C6-C10)	mg/L	0.10	12
F2 (C10-C16 Hydrocarbons)	mg/L	10	3600 (1)
F3 (C16-C34 Hydrocarbons)	mg/L	4.0	3400 (1)
F4 (C34-C50 Hydrocarbons)	mg/L	4.0	510 (1)
Reached Baseline at C50	mg/L	-	No
Volatiles			
Benzene	mg/L	0.00040	0.0012
Toluene	mg/L	0.00040	0.12
Ethylbenzene	mg/L	0.00040	0.53
m & p-Xylene	mg/L	0.00080	1.7
o-Xylene	mg/L	0.00040	0.87
Xylenes (Total)	mg/L	0.00080	2.6
Polycyclic Aromatics			
Benzo[a]pyrene equivalency	ug/L	0.010	12000
Acenaphthene	mg/L	1.0	39
Acenaphthylene	mg/L	1.0	1.4
Acridine	mg/L	2.0	<2.0
Anthracene	mg/L	0.10	17
Benzo(a)anthracene	mg/L	15	<15 (2)
Benzo(b&j)fluoranthene	mg/L	0.085	13
Benzo(k)fluoranthene	mg/L	0.085	4.3
Benzo(g,h,i)perylene	mg/L	0.085	2.5
Benzo(c)phenanthrene	mg/L	0.50	2.3
Benzo(a)pyrene	mg/L	0.075	8.1
Benzo[e]pyrene	mg/L	0.50	6.1
Chrysene	mg/L	0.085	11
Dibenz(a,h)anthracene	mg/L	0.075	0.82
Fluoranthene	mg/L	0.40	52
Fluorene	mg/L	0.50	33
Indeno(1,2,3-cd)pyrene	mg/L	0.085	3.0
2-Methylnaphthalene	mg/L	1.0	57
Naphthalene	mg/L	1.0	200
Phenanthrene	mg/L	0.50	86
Perylene	mg/L	0.50	1.8
Pyrene	mg/L	0.20	37
Quinoline	mg/L	2.0	<2.0
Phenols			
2,3,4-trichlorophenol	mg/L	0.048	<0.048
Cresols	mg/L	0.13	<0.13
Phenol	mg/L	0.048	<0.048
3 & 4-chlorophenol	mg/L	9.7	<9.7 (3)
2,3,5,6-tetrachlorophenol	mg/L	0.048	<0.048
2,3,4,6-tetrachlorophenol	mg/L	0.048	<0.048
2,4,5-trichlorophenol	mg/L	0.048	<0.048
2,4,6-trichlorophenol	mg/L	0.048	<0.048
2,3,5-trichlorophenol	mg/L	0.048	<0.048
2,4-dichlorophenol	mg/L	0.17	<0.17 (3)
2,4-dimethylphenol	mg/L	0.56	<0.56 (3)
2,4-dinitrophenol	mg/L	0.48	<0.48
2,6-dichlorophenol	mg/L	0.048	<0.048
2-chlorophenol	mg/L	0.048	<0.048
2-methylphenol	mg/L	0.048	<0.048
2-nitrophenol	mg/L	0.48	<0.48
3 & 4-methylphenol	mg/L	0.13	<0.13 (3)
4,6-dinitro-2-methylphenol	mg/L	0.48	<0.48
4-chloro-3-methylphenol	mg/L	0.048	<0.048
4-nitrophenol	mg/L	3.4	<3.4 (3)
Pentachlorophenol	mg/L	0.048	<0.048

Notes:
Sample collected April 25, 2013
RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range
(2) Detection limits raised due to matrix interference.
(3) Detection limits raised due to sample matrix.

Table 11: Summary of Bedrock Elevations
Canada Creosote Site - North Bow
Screening Level Risk Assessment Update

Sample ID	Ground Surface Elevation (masl)	Observed Depth to Bedrock (mbgs)*	Bedrock Elevation (masl)
MW10-3A	1050.674	6.5	1044.17
MW10-7A	1050.008	3.7	1046.35
MW10-7B	1050.112	3.9	1046.21
MW11-01A	1050.392	4.9	1045.49
MW11-03A	1050.174	6.4	1043.77
MW11-04A	1050.354	5.2	1045.15
MW11-06	1050.865	4.3	1046.57
MW11-07	1050.666	7.0	1043.67
MW1A	-	7.1	1043.52
MW2B	-	7.3	1043.19
MW3B	-	7.8	1042.78
MW4B	-	9.2	1040.87
MW5B	-	8.5	1041.68
MW6B	-	7.0	1043.58
MW7B	-	7.0	1043.45

Notes:
mbgs - metres below ground surface
masl - metres above sea level
" - " - date not available
* Based on observations during driling by Golder or borehole logs provided in historical reports
Table to be read in conjunction with accompanying report.

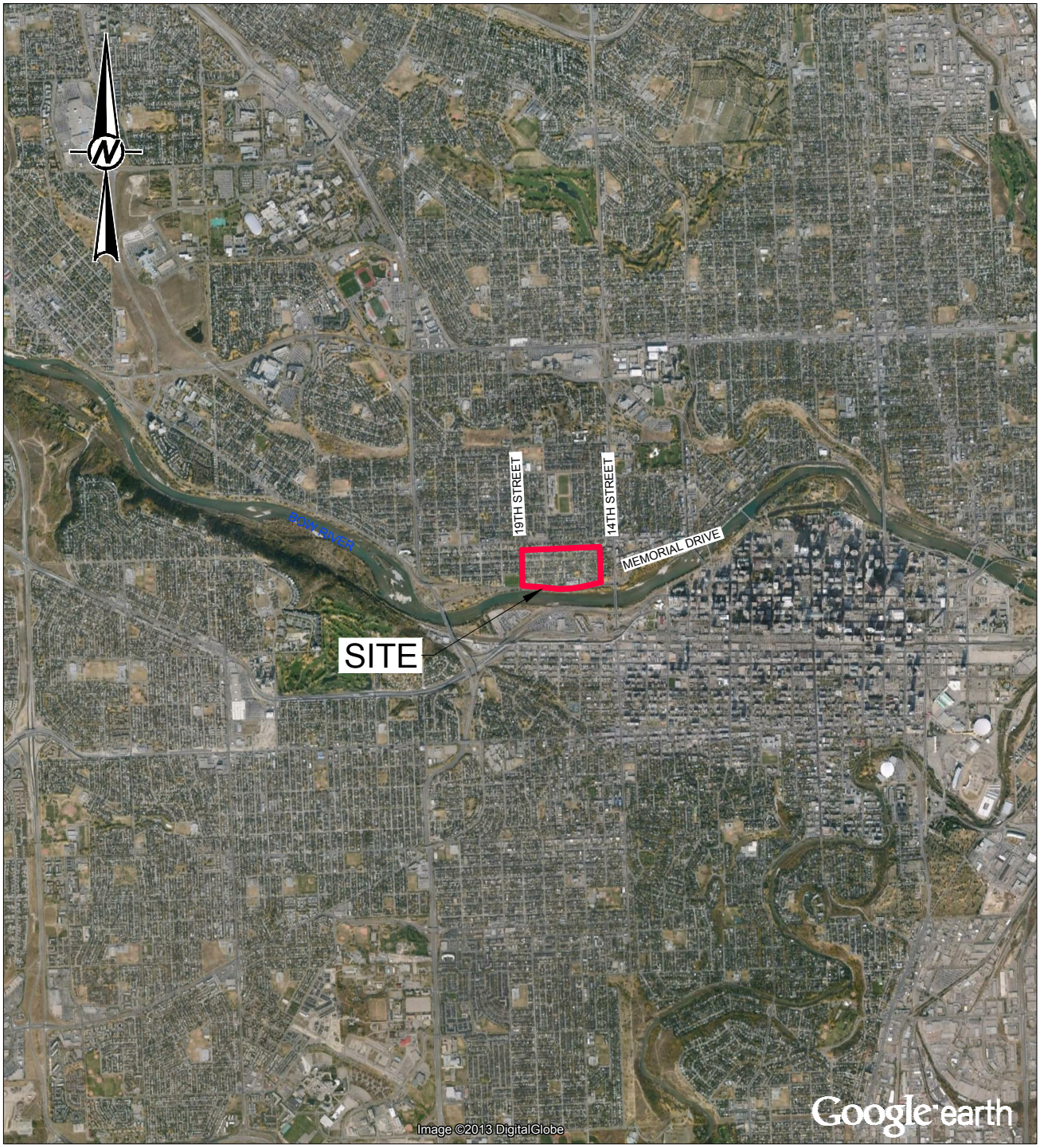
Table 12: Comparison of Predicted Measured Soil Vapour Concentrations
(Xylenes and Naphthalene)
Canada Creosote Site - North Bow
Screening Level Risk Assessment Update

Sample Name		MW10-1		MW10-2	MW10-3B	MW10-6	DUP 2 (MW10-06)	MW10-7B	DUP 1 (MW10-7B)	MW10-7A	MW10-9B	MW10-10
Location												
Date		3/1/2011	11/13/2012	3/1/2011	3/1/2011	3/1/2011	3/1/2011	3/1/2011	3/1/2011	11/13/2012	3/1/2011	3/1/2011
QA/QC												
Xylenes, Total	**Unit**											
Shallow groundwater	mg/L	< 0.0008	< 0.0008	< 0.0008	0.0028	0.0081	0.0085	0.0052	0.0036	0.29	< 0.0008	0.0017
Predicted soil vapour	µg/m^3	NA	NA	NA	835.04	2416	2535	1551	1074	86487	NA	507
Maximum measured soil vapour	µg/m^3	30	<1.6	5.2	46	110	110	130	130	<1.14	250	30
Ratio of measured to predicted		NA	NA	NA	0.06	0.05	0.04	0.08	0.12	NA	NA	0.06
Naphthalene												
Shallow groundwater	mg/L	0.02		< 0.00010	0.00	0.77	0.68	0.13	0.2	3.8	0.0012	0.092
Predicted soil vapour	µg/m^3	347	Insuficient	NA	4.68	13349	11789	2254	3467	65881	21	1595
Maximum measured soil vapour	µg/m^3	0.34	Sample Volume	<0.31	0.34	58	58	45	45	<0.33	0.64	0.47
Ratio of measured to predicted		0.0010		NA	0.07	0.0043	0.0049	0.0200	0.0130	NA	0.0308	0.0003

Sample Name		MW10-11	MW10-15	MW10-16		MW10-18	MW10-20	MW10-22	MW11-01A* and VP11-01B	MW11-03A* and VP11-03B	MW11-04A* and VP11-04B
Location											
Date		3/1/2011	3/1/2011	3/1/2011	11/13/2012	3/1/2011	3/1/2011	3/1/2011	11/10/2012	11/10/2012	11/9/2012
QA/QC											
Xylenes, Total	**Unit**										
Shallow groundwater	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.0016	< 0.0008	0.68	< 0.0008	< 0.0008
Predicted soil vapour	µg/m^3	NA	NA	NA	NA	NA	477	NA	202796	NA	NA
Maximum measured soil vapour	µg/m^3	16	53	180	6.2	100	44	39	3.2	25	3
Ratio of measured to predicted		NA	NA	NA	NA	NA	0.09	NA	0.000016	NA	NA
Naphthalene											
Shallow groundwater	mg/L	0.00031	0.00023	0.0013	0.00061	0.0021	0.00016	0.0011	6.4	0.00049	0.0016
Predicted soil vapour	µg/m^3	5.4	4.0	23	11	36	2.8	19	110957	8.5	27.7
Maximum measured soil vapour	µg/m^3	0.48	1.30	0.77	<1.25	0.34	2.70	1.14	1.8	<0.33	0.30
Ratio of measured to predicted		0.0893	0.326	0.0342	NA	0.0093	0.973	0.0598	0.000016	NA	0.011

Notes:
mg/L = milligrams per litre
µg/m^3 = micrograms per cubic metre
NA = Not Applicable
* = concentration from deep well
Highest concentration of the 2012/2013 soil vapour data taken when muilt depth probes were present

FIGURES



0 1,000 2,000 3,000

SCALE (APPROX.) METRES

LEGEND

GOLDER PROJECT

REFERENCE

IMAGE OBTAINED FROM GOOGLE EARTH, USED UNDER LICENSE.
IMAGERY DATE: APR. 8, 2013. GOOGLE EARTH IMAGE IS NOT TO SCALE.
DATEUM: NAD83, PROJECTIO: UTM ZONE 11.

PROJECT

ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE HUMAN HEALTH RISK ASSESSMENT

TITLE

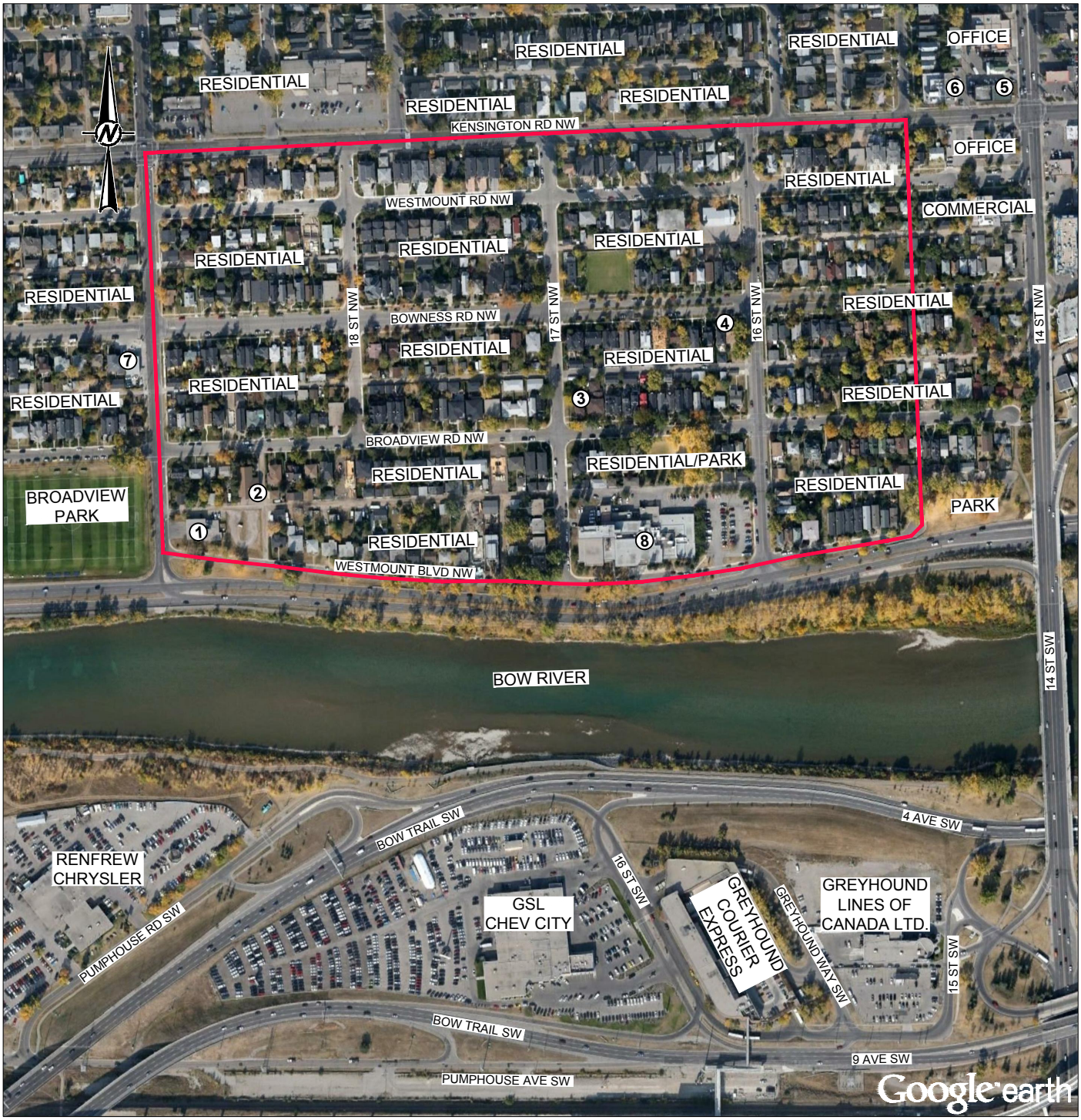
SITE LOCATION PLAN

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C101
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN
CADD	AM	2014-07-18		
CHECK	JMB	2014-07-18		
REVIEW	IH	2014-07-18		

FIGURE: 1

L:\2011\1324\11-1324-01647000\Report_C\11132401647000C101.dwg | Layout: Site Location Plan | Modified: AMagheran 07/18/2014 2:31 PM | Plotted: AMagheran 07/18/2014



0 100 200 300

SCALE (APPROX.) METRES

LEGEND

- SITE LOCATION
- ① EMS/FIRE HALL #6 (4 MWs NOTED)
- ② ST. BONIFACE GERMAN CHURCH
- ③ BOW VALLEY LAWN BOWLING CLUB
- ④ ETHIOPIAN EVANGELICAL CHURCH IN CALGARY
- ⑤ LINDAL CEDAR HOMES (6 MWs NOTED)
- ⑥ MULTI TENANT COMMERCIAL (2 MWs NOTED)
- ⑦ HI HO SERVICE STATION (2 USTs)
- ⑧ CBC BUILDING (10 MWs NOTED)

REFERENCE

IMAGE OBTAINED FROM GOOGLE EARTH, USED UNDER LICENSE.
IMAGERY DATE: SEPT. 22, 2012. GOOGLE EARTH IMAGE IS NOT TO SCALE.
DATEUM: NAD83, PROJECTIO: UTM ZONE 11.

PROJECT
ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE HUMAN HEALTH RISK ASSESSMENT

TITLE
SITE PLAN

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C102	
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN	
CADD	AM	2014-07-18			
CHECK	JMB	2014-07-18			
REVIEW	IH	2014-07-18			

FIGURE: 2

LEGEND

- DEEP MONITORING WELL LOCATION
- MULTI-DEPTH VAPOUR PROBE LOCATION
- SHALLOW MONITORING WELL LOCATION
- SINGLE -DEPTH VAPOUR PROBE LOCATION
- HISTORICAL WELL WITH MEASURABLE DNAPL
- HISTORICAL WELL WITH DNAPL AND/OR LNAPL SHEEN
- STUDY AREA
- HISTORICAL NAPL ZONES

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.

PROJECT

ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE HUMAN HEALTH RISK ASSESSMENT

TITLE

MONITORING WELL AND VAPOUR PROBE LOCATIONS

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C103
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN
CADD	AM	2014-07-18		
CHECK	JMB	2014-07-18		
REVIEW	IH	2014-07-18		

FIGURE: 3

WESTMOUNT RD.

19TH ST. NW

18TH ST. NW

17TH ST. NW

16TH ST. NW

BOWNESS RD.

HI-LO GAS

MW10-12

MW10-22

MW11-03A

MW10-16

MW10-07A

3.7

MW10-09A

MW10-20

MW10-10

MW10-11

MW11-01A

4.9

BROADVIEW RD.

MW10-06

VP11-01B

VP11-02

MW10-07B

3.9

MW10-18

6.4

VP11-03B

MW10-09B

VP11-09B

MW11-04A

5.2

VP11-04B

VP11-08

MW3A

MW3B

7.8

FIREHALL (EMS)

CBC

MW4A

MW4B

9.2

MW2A

MW2B

7.3

MW5A

MW5B

8.5

MW10-05

WESTMOUNT BLVD.

MW10-01

MW11-6

4.3

MW10-02

MW10-03A

6.5

MW11-07

7.0

MW6A

MW6B

7.0

MW10-14

MW10-15

MW1A

7.1

MW1B

MW7A

MW7B

7.0

MEMORIAL DRIVE

MW10-03B

0 40 80 120

SCALE (APPROX.) METRES

LEGEND

3.9 DEPTH TO BEDROCK (METRES BELOW GROUND SURFACE)	HISTORICAL WELL WITH MEASURABLE DNAPL
DEEP MONITORING WELL LOCATION	HISTORICAL WELL WITH DNAPL AND/OR LNAPL SHEEN
MULTI-DEPTH VAPOUR PROBE LOCATION	STUDY AREA
SHALLOW MONITORING WELL LOCATION	HISTORICAL NAPL ZONES
SINGLE -DEPTH VAPOUR PROBE LOCATION	

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.

PROJECT

ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE HUMAN HEALTH RISK ASSESSMENT

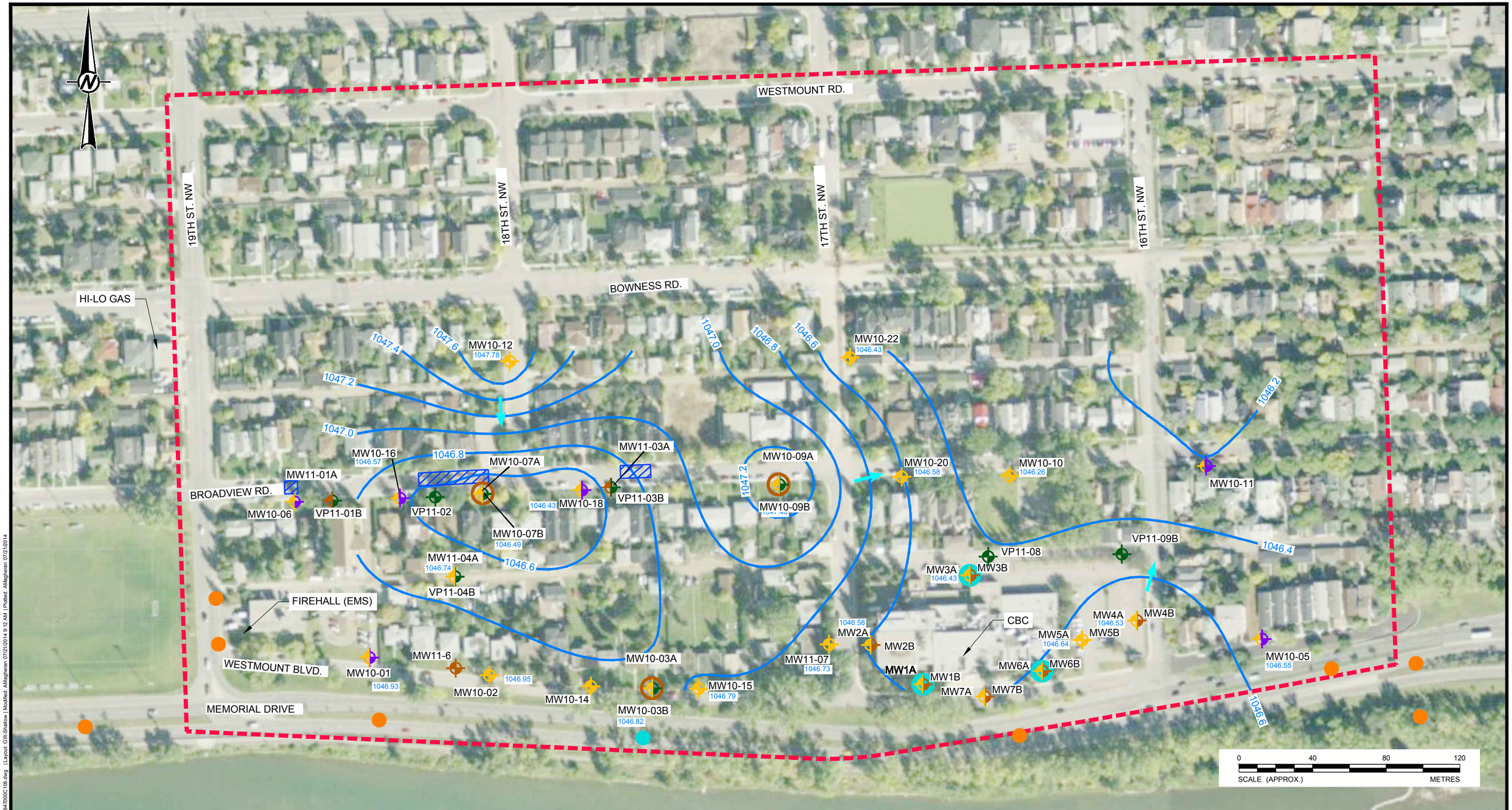
TITLE

DEPTH OF BEDROCK

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C104	
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN	
CADD	AM	2014-07-18			
CHECK	JMB	2014-07-18			
REVIEW	IH	2014-07-18			

FIGURE: 4



LEGEND

- DEEP MONITORING WELL LOCATION
- MULTI-DEPTH VAPOUR PROBE LOCATION
- SHALLOW MONITORING WELL LOCATION
- SINGLE -DEPTH VAPOUR PROBE LOCATION
- HISTORICAL WELL WITH MEASURABLE DNAPL
- HISTORICAL WELL WITH DNAPL AND/OR LNAPL SHEEN
- 1046.57 GROUNDWATER ELEVATION (METRES ABOVE SEA LEVEL)
- DIRECTION OF GROUNDWATER FLOW
- 1047.0 GROUNDWATER CONTOUR (METRES ABOVE SEA LEVEL)
- STUDY AREA
- HISTORICAL NAPL ZONES

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.

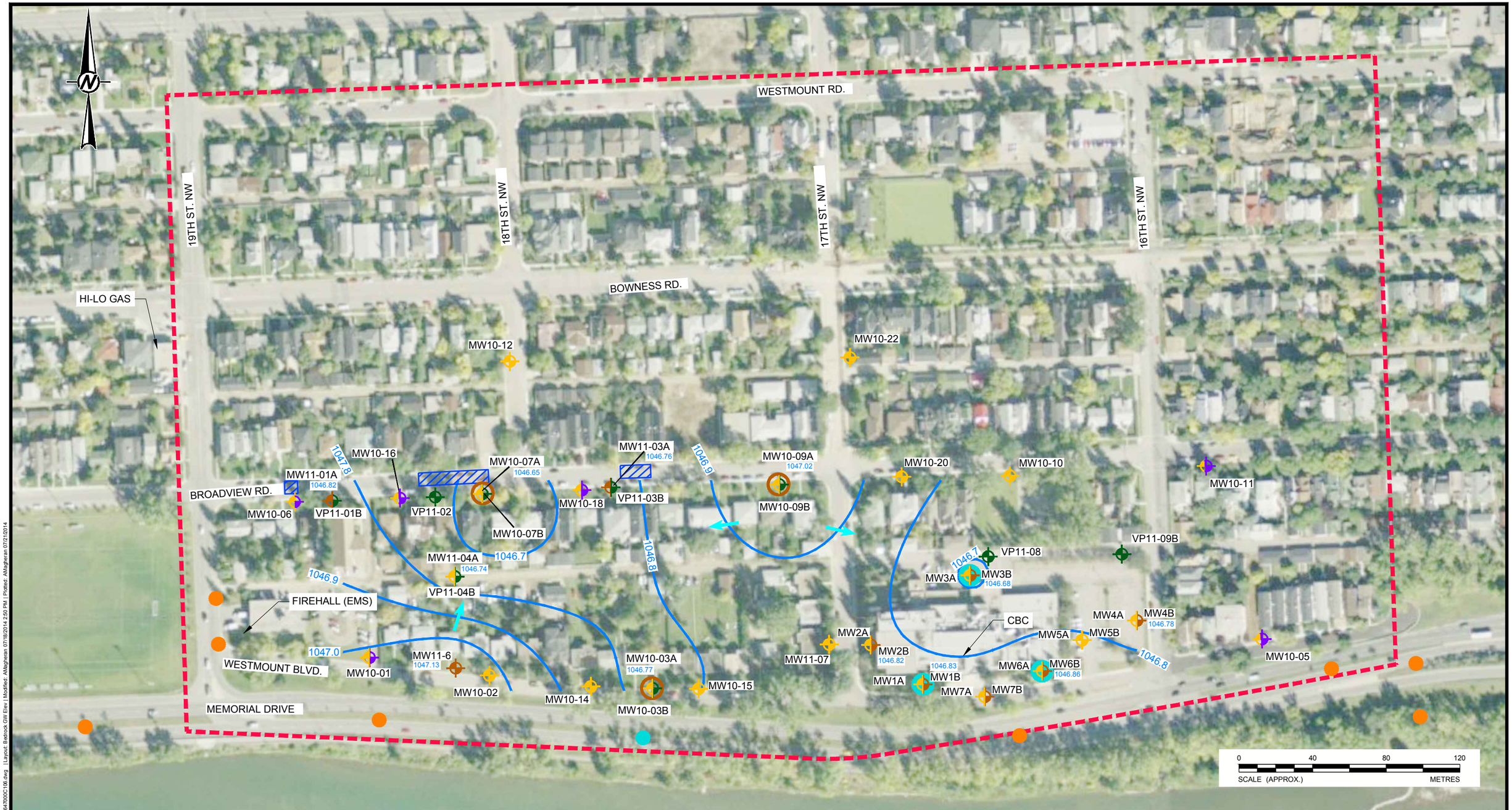
PROJECT
ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE
HUMAN HEALTH RISK ASSESSMENT

TITLE
SHALLOW GROUNDWATER ELEVATION AND FLOW DIRECTION OCTOBER 30, 2012

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C105	
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN	
CADD	AM	2014-07-18			
CHECK	JMB	2014-07-18			
REVIEW	IH	2014-07-18			

FIGURE: 5



LEGEND

- DEEP MONITORING WELL LOCATION
- MULTI-DEPTH VAPOUR PROBE LOCATION
- SHALLOW MONITORING WELL LOCATION
- SINGLE -DEPTH VAPOUR PROBE LOCATION
- HISTORICAL WELL WITH MEASURABLE DNAPL
- HISTORICAL WELL WITH DNAPL AND/OR LNAPL SHEEN
- 1046.57 GROUNDWATER ELEVATION (METRES ABOVE SEA LEVEL)
- DIRECTION OF GROUNDWATER FLOW
- -1046.86- GROUNDWATER CONTOUR (METRES ABOVE SEA LEVEL)
- STUDY AREA
- HISTORICAL NAPL ZONES

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.

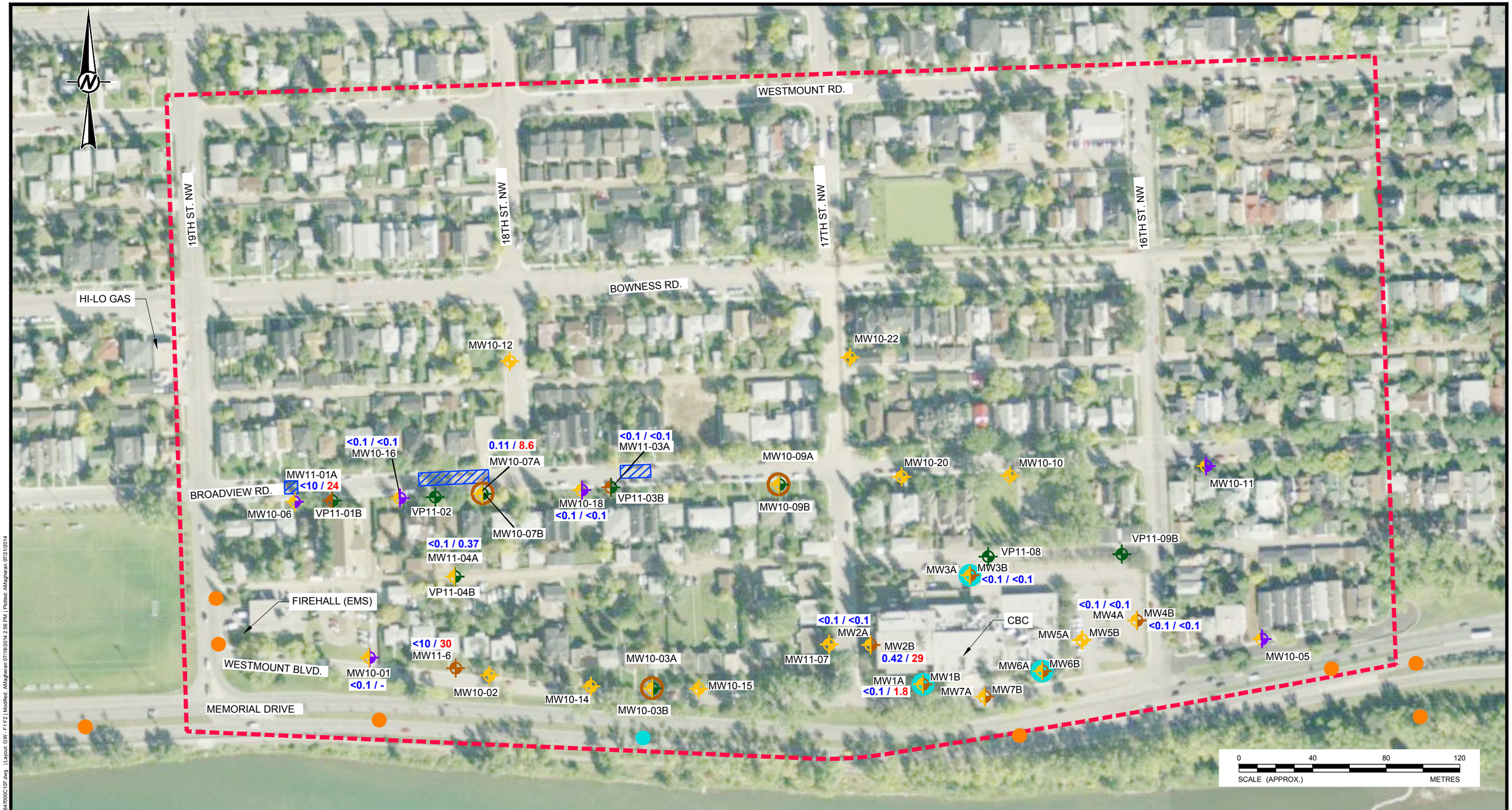
PROJECT
ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE HUMAN HEALTH RISK ASSESSMENT

TITLE
BEDROCK GROUNDWATER ELEVATIONS AND FLOW DIRECTION OCTOBER 30, 2012

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C106	
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN	
CADD	AM	2014-07-18			
CHECK	JMB	2014-07-18			
REVIEW	IH	2014-07-18			

FIGURE: 6



LEGEND

<0.1 / 0.1	GROUNDWATER F1 / F2 CONCENTRATIONS (mg/L)
1.8	CONCENTRATION EXCEEDS AB TIER 1 GUIDELINE (COARSE-GRAINED SOIL RESIDENTIAL LAND US)
	DEEP MONITORING WELL LOCATION
	MULTI-DEPTH VAPOUR PROBE LOCATION
	SHALLOW MONITORING WELL LOCATION
	SINGLE -DEPTH VAPOUR PROBE LOCATION
	HISTORICAL WELL WITH MEASURABLE DNAPL
	HISTORICAL WELL WITH DNAPL AND/OR LNAPL SHEEN
	STUDY AREA
	HISTORICAL NAPL ZONES

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.

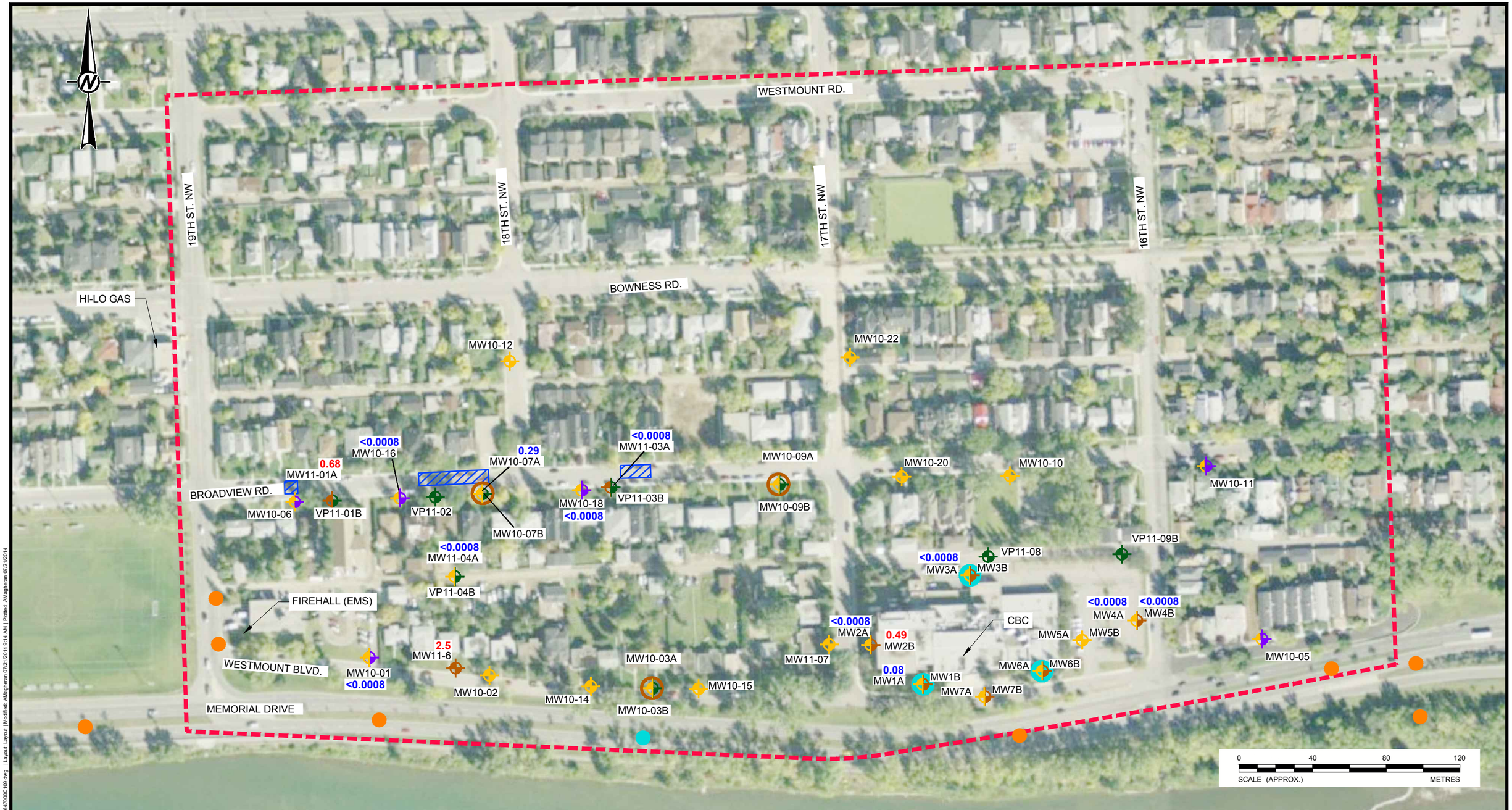
PROJECT
ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE
HUMAN HEALTH RISK ASSESSMENT

TITLE
GROUNDWATER F1 AND F2 CONCENTRATIONS NOVEMBER 2012

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C107	
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN	
CADD	AM	2014-07-18			
CHECK	JMB	2014-07-18			
REVIEW	IH	2014-07-18			

FIGURE: 10



LEGEND

<0.0008	GROUNDWATER TOTAL XYLENE CONCENTRATIONS (mg/L)
2.5	CONCENTRATION EXCEEDS AB TIER 1 GUIDELINE (COARSE-GRAINED SOIL RESIDENTIAL LAND US)
	DEEP MONITORING WELL LOCATION
	MULTI-DEPTH VAPOUR PROBE LOCATION
	SHALLOW MONITORING WELL LOCATION
	SINGLE -DEPTH VAPOUR PROBE LOCATION
	HISTORICAL WELL WITH MEASURABLE DNAPL
	HISTORICAL WELL WITH DNAPL AND/OR LNAPL SHEEN
	STUDY AREA
	HISTORICAL NAPL ZONES

NOTE

1. ALL LOCATIONS ARE APPROXIMATE

PROJECT

ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE HUMAN HEALTH RISK ASSESSMENT

TITLE

GROUNDWATER XYLENE CONCENTRATIONS NOVEMBER 2012

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C109	
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN	
CADD	AM	2014-07-18			
CHECK	JMB	2014-07-18			
REVIEW	IH	2014-07-18			

FIGURE: 11

WESTMOUNT RD.

19TH ST. NW

18TH ST. NW

17TH ST. NW

16TH ST. NW

BOWNESS RD.

HI-LO GAS

BROADVIEW RD.

FIREHALL (EMS)

WESTMOUNT BLVD.

MEMORIAL DRIVE

CBC

MW10-12

MW10-22

MW11-01A

MW10-16 0.00061

MW10-07A 3.8

MW11-03A 0.00049

MW10-09A

MW10-20

MW10-10

MW10-11

6.4

MW10-06

VP11-01B

VP11-02

MW10-07B

MW10-18 0.0086

VP11-03B

MW10-09B

VP11-09B

MW11-04A 0.0016

VP11-04B

VP11-08

0.0017 MW3A

MW3B

<0.0001 MW4A

0.0018 MW4B

MW5A

MW5B

MW10-05

MW10-01

15 MW11-6

MW10-02

MW10-03A

MW10-14

MW10-03B

MW10-15

<0.0001 MW2A

13 MW2B

MW11-07

0.89 MW1A

MW1B

MW7A

MW7B

MW6A

MW6B

0 40 80 120

SCALE (APPROX.) METRES

LEGEND

<0.0001 GROUNDWATER NAPTHALENE CONCENTRATIONS (mg/L)

15 CONCENTRATION EXCEEDS AB TIER 1 GUIDELINE (COARSE-GRAINED SOIL RESIDENTIAL LAND US)

DEEP MONITORING WELL LOCATION

MULTI-DEPTH VAPOUR PROBE LOCATION

SHALLOW MONITORING WELL LOCATION

SINGLE -DEPTH VAPOUR PROBE LOCATION

HISTORICAL WELL WITH MEASURABLE DNAPL

HISTORICAL WELL WITH DNAPL AND/OR LNAPL SHEEN

STUDY AREA

HISTORICAL NAPL ZONES

NOTE

1. ALL LOCATIONS ARE APPROXIMATE.

PROJECT

ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE HUMAN HEALTH RISK ASSESSMENT

TITLE

GROUNDWATER NAPTHALENE CONCENTRATIONS NOVEMBER 2012

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C108	
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN	
CADD	AM	2014-07-18			
CHECK	JMB	2014-07-18			
REVIEW	IH	2014-07-18			

FIGURE: 12

LEGEND

- <330/<320 — HIGHEST OF SOIL VAPOUR F1/F2 CONCENTRATIONS (µg/m ^{3}) MEASURED ON NOVEMBER 2012 OR APRIL 2013
- DEEP MONITORING WELL LOCATION
- MULTI-DEPTH VAPOUR PROBE LOCATION
- SHALLOW MONITORING WELL LOCATION
- SINGLE -DEPTH VAPOUR PROBE LOCATION
- HISTORICAL WELL WITH MEASURABLE DNAPL
- HISTORICAL WELL WITH DNAPL AND/OR LNAPL SHEEN
- STUDY AREA
- HISTORICAL NAPL ZONES

NOTES

1. WHEN MULTIPLE PROBES ARE PRESENT AT ONE LOCATION, THE MAXIMUM CONCENTRATION WAS PLOTTED.
2. SUMMA CANISTER SAMPLE DATA PLOTTED WHERE AVAILABLE AS OPPOSED TO SORBENT TUBE DATA.
3. ALL LOCATIONS ARE APPROXIMATE.

* NOVEMBER 2012 SORBENT TUBE DATA (PLOTTED WHERE NO OTHER DATA IS AVAILABLE) IS POSSIBLY BIASED LOW.

PROJECT
ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE HUMAN HEALTH RISK ASSESSMENT

TITLE
SOIL VAPOUR F1 AND F2 CONCENTRATIONS NOVEMBER 2012 AND APRIL 2013

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C110
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN
CADD	AM	2014-07-18		
CHECK	JMB	2014-07-18		
REVIEW	IH	2014-07-18		

FIGURE: 14

WESTMOUNT RD.

19TH ST. NW

18TH ST. NW

17TH ST. NW

16TH ST. NW

BOWNESS RD.

HI-LO GAS

MW10-12

MW10-22
0.4*

MW10-16
0.58

MW11-01A

BROADVIEW RD.

MW10-06
32000

VP11-01B
1.8*
[111000]

VP11-02
<0.33*

MW10-07A

MW10-07B
<0.33
[66000]

MW11-03A

MW10-18

VP11-03B
<0.33*
[8.5]

MW10-09A

MW10-09B

MW10-20

MW10-10

MW10-11

1.64
VP11-09B

2.08
VP11-08

MW3A

MW3B

MW11-04A

VP11-04B
0.3*
[28]

FIREHALL (EMS)

WESTMOUNT BLVD.

MW10-01
<0.33*

MW11-6

MW10-02

MW10-14

MW10-03A

MW10-03B
20*

MW10-15
2.14

MEMORIAL DRIVE

MW2A

MW2B

MW11-07

CBC

MW4A

MW4B

MW5A

MW5B

MW10-05
<0.32*

MW1A

MW1B

MW7A

MW7B

MW6A

MW6B

0 40 80 120
SCALE (APPROX.) METRES

LEGEND

<0.34	HIGHEST SOIL VAPOUR NAPTHALENE CONCENTRATIONS (µg/m ^{3}) MEASURED IN NOVEMBER 2012 OR APRIL 2013
[66000]	SOIL VAPOUR CONCENTRATIONS PREDICTED FROM SHALLOW GROUNDWATER CONCENTRATION USING HENRY'S LAW CONSTANT
	DEEP MONITORING WELL LOCATION
	MULTI-DEPTH VAPOUR PROBE LOCATION
	SHALLOW MONITORING WELL LOCATION
	SINGLE -DEPTH VAPOUR PROBE LOCATION
	HISTORICAL WELL WITH MEASURABLE DNAPL
	HISTORICAL WELL WITH DNAPL AND/OR LNAPL SHEEN
	STUDY AREA
	HISTORICAL NAPL ZONES

NOTES

1. WHEN MULTIPLE PROBES ARE PRESENT AT ONE LOCATION, THE MAXIMUM CONCENTRATION WAS PLOTTED.
2. SUMMA CANISTER SAMPLE DATA PLOTTED WHERE AVAILABLE AS OPPOSED TO SORBENT TUBE DATA.
3. ALL LOCATIONS ARE APPROXIMATE.

* NOVEMBER 2012 SORBENT TUBE DATA (PLOTTED WHERE NO OTHER DATA IS AVAILABLE) IS POSSIBLY BIASED LOW.

PROJECT
ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE HUMAN HEALTH RISK ASSESSMENT

TITLE
SOIL VAPOUR NAPTHALENE CONCENTRATIONS NOVEMBER 2012 AND APRIL 2013

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C111	
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN	
CADD	AM	2014-07-18			
CHECK	JMB	2014-07-18			
REVIEW	IH	2014-07-18			

FIGURE: 15

LEGEND

- 25 — HIGHEST SOIL VAPOUR TOTAL XYLENE CONCENTRATIONS (µg/m ^{3}) MEASURED IN NOVEMBER 2012 OR APRIL 2013
- DEEP MONITORING WELL LOCATION
- MULTI-DEPTH VAPOUR PROBE LOCATION
- SHALLOW MONITORING WELL LOCATION
- SINGLE -DEPTH VAPOUR PROBE LOCATION
- HISTORICAL WELL WITH MEASURABLE DNAPL
- HISTORICAL WELL WITH DNAPL AND/OR LNAPL SHEEN
- STUDY AREA
- HISTORICAL NAPL ZONES

NOTES

1. WHEN MULTIPLE PROBES ARE PRESENT AT ONE LOCATION, THE MAXIMUM CONCENTRATION WAS PLOTTED.
2. SUMMA CANISTER SAMPLE DATA PLOTTED WHERE AVAILABLE AS OPPOSED TO SORBENT TUBE DATA.
3. ALL LOCATIONS ARE APPROXIMATE.

* NOVEMBER 2012 SORBENT TUBE DATA (PLOTTED WHERE NO OTHER DATA IS AVAILABLE) IS POSSIBLY BIASED LOW.

PROJECT
ALBERTA ENVIRONMENT SUSTAINABLE RESOURCE DEVELOPMENT - NORTH BOW SITE HUMAN HEALTH RISK ASSESSMENT

TITLE
SOIL VAPOUR TOTAL XYLENES CONCENTRATION NOVEMBER 2012 AND APRIL 2013

Golder Associates

PROJECT No.	11.1324.0164.7000		FILE No.	11132401647000C112	
DESIGN	JMB	2014-07-18	SCALE	AS SHOWN	
CADD	AM	2014-07-18			
CHECK	JMB	2014-07-18			
REVIEW	IH	2014-07-18			

FIGURE: 16

APPENDIX A

Borehole Logs and Well Completion Details

DATA ENTRY: IPG

PROJECT No.: 11-1324-0164

RECORD OF MONITORING WELL: MW11-01A

SHEET 1 OF 1

LOCATION: See Location Plan

BORING DATE: December 13, 2011

DATUM: UTM Zone 11 (Nad 83)

N: 702954 E: 5659383

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	Soil Vapour Content (ppm) ⊕ 2 4 6 8 / Soil Vapour Content (ppm) □ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp W Wl 10 20 30 40	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Grass		1050.39							
0	200 mm Soil Core Sonic Rig, Beck Drilling and Environmental Services Ltd.	(OH) ORGANIC SILT, some rootlets, dark brown, dry, loose		0.06							J-Plug Flush Mount Road Box 10/20 Sand
1		(SM) Very fine SILTY SAND, medium brown, non-cohesive, moist, loose			1	CORE		⊕			
2											
		--- Trace fine gravel, wet from 2.4 to 3.0 m			2	CORE		⊕			Hydrated Bentonite Chips
3				1047.34							
		(SP) Very fine and fine SAND, brown, non-cohesive, moist, loose		3.05	3	CORE		⊕			
				1047.04							
		(SP) Very fine and fine SAND and (GW) GRAVEL, some cobbles (<70 mm Ø), trace silt, brown, non-cohesive, moist, loose		3.35	4	CORE		⊕			30 Oct 2012 ▽
4		--- Rusty brown from 4.0 to 4.3 m									
				1046.12							
		(ML) Very fine SANDY SILT, trace cobbles, trace clay, medium grey, cohesive, w~PL, firm		4.27	5	CORE		⊕			
		--- Trace fine sand seams (10 mm) at 4.6 m		1045.51							
5		SILTSTONE, grey, cohesive, w<PL, hard (BEDROCK)		4.88	6	CORE		⊕			
		--- Weathered from 4.9 to 5.2 m									
6					7	CORE		□			Slotted Section 10/20 Sand
7					8	CORE		⊕			10/20 Sand
											Hydrated Bentonite Chips
8				1041.85							
		End of MONITORING WELL.		8.53							
9		NOTES: Standpipe installed to 7.0 m. Measured groundwater level at 3.6 mbgs on October 30, 2012.									
10											

BOREHOLE - EXPANDED ADD. LAB TESTING 11-1324-0164_BHLOGS.GPJ CALGARY.GDT 6/27/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: NB/BS

CHECKED: JMB

DATA ENTRY: IPG

PROJECT No.: 11-1324-0164

RECORD OF MONITORING WELL: MW11-03A

SHEET 1 OF 1

LOCATION: See Location Plan

N: 703085 E: 5659398

BORING DATE: December 16, 2011

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	Soil Vapour Content (ppm) ⊕ 2 4 6 8	Soil Vapour Content (ppm) □ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3}	WATER CONTENT PERCENT Wp W Wl 10 20 30 40	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Grass		1050.17									
0	200 mm Soil Core Sonic Rig, Beck Drilling and Environmental Services Ltd.	(OL) ORGANIC SILT, trace rootlets, medium brown, non-cohesive, dry, loose		0.15									Flush Mount Road Box 10/20 Sand
1		(SM) SILTY SAND, some fine gravel, trace coarse gravel, well-graded, medium brown, non-cohesive, moist, compact (likely because frozen)			1	CORE		⊕					
		--- Trace fine and coarse gravel, poorly-graded, dark brown, non-cohesive, moist from 1.2 to 1.8 m			2	CORE		⊕					
				1048.34									
2		(SW) SAND and (GP) GRAVEL, well-graded, light brown, non-cohesive, dry to moist, loose		1.83	3	CORE		⊕					
3					4	CORE			⊕				30 Oct 2012 ▽ Hydrated Bentonite Chips
4		--- Some silt, light grey, trace oxidation straining, dry from 4.3 to 5.5 m											
5					5	CORE			⊕				
				1044.68									
		(ML) SILT and (SW) SAND, trace clay, trace medium to coarse gravel, grey, cohesive, w~PL, hard		5.49	6A	CORE			⊕				
6		--- Creosote-like odour from 5.5 to 8.5 m											
		--- Increasing sand, some pink discolouration, loose from 6.1 to 6.4 m			6B	CORE		⊕					10/20 Sand
				1043.77									
		SILTSTONE, grey, cohesive, w<PL, hard (BEDROCK)		6.40									
7		--- Weathered from 6.4 to 8.5 m			7	CORE		⊕					
					8	CORE			⊕				Slotted Section 10/20 Sand
					9	CORE		⊕					
8		--- Black from 7.9 to 8.5 m			10	CORE		⊕					Hydrated Bentonite Chips
				1041.64									
		End of MONITORING WELL.		8.53									
9		NOTES: Standpipe installed to 8.2 m. Measured groundwater level at 3.4 mbgs on October 30, 2012.											
10													

BOREHOLE - EXPANDED ADD. LAB TESTING 11-1324-0164_BHLOGS.GPJ CALGARY.GDT 6/27/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: BS

CHECKED: JMB

DATA ENTRY: IPG

PROJECT No.: 11-1324-0164

RECORD OF MONITORING WELL: MW11-04A

SHEET 1 OF 1

LOCATION: See Location Plan

N: 702995 E: 5659334

BORING DATE: December 14, 2011

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	Soil Vapour Content (ppm) ⊕ 2 4 6 8 / Soil Vapour Content (ppm) □ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp W Wl 10 20 30 40	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		Gravel		1050.35							
	200 mm Soil Core Sonic Rig (Beck Drilling and Environmental Services Ltd.)	NO RECOVERY due to hydrovac, likely sand and gravel, some cobbles		0.00							J-Plug Flush Mount Road Box 10/20 Sand
1											Hydrated Bentonite Chips
		--- Slightly moist from 1.5 to 2.1 m		1048.67							
2		(SP) Very fine and fine SAND and fine and coarse (GW) GRAVEL, trace cobbles (<80 mm Ø), trace silt, brown, non-cohesive, loose --- Dry from 2.1 to 2.4 m		1.68	1	CORE		⊕			10/20 Sand
3		--- Slightly moist from 2.7 to 5.2 m			2	CORE		⊕			
					3	CORE		⊕			30 Oct 2012 Slotted Section 10/20 Sand
4					4	CORE		⊕			
5				1045.17							Hydrated Bentonite Chips
		SILTSTONE, grey, cohesive, w<PL, hard (BEDROCK) --- Trace gravel, weathered from 5.2 to 5.3 m		5.18 1044.86	5	CORE		⊕			
		End of MONITORING WELL.		5.49							
6		NOTES: Standpipe installed to 5.1 m. Measured groundwater level at 3.6 mbgs on October 30, 2012.									
7											
8											
9											
10											

BOREHOLE - EXPANDED ADD. LAB TESTING 11-1324-0164_BHLOGS.GPJ CALGARY.GDT 6/27/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: NB

CHECKED: JMB

DATA ENTRY: IPG

PROJECT No.: 11-1324-0164

RECORD OF MONITORING WELL: MW11-06

SHEET 1 OF 1

LOCATION: See Location Plan

N: 703005 E: 5659299

BORING DATE: December 15, 2011

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	Soil Vapour Content (ppm) ⊕ 2 4 6 8	Soil Vapour Content (ppm) □ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3}	WATER CONTENT PERCENT Wp W Wl 10 20 30 40	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Grass		1050.86									
0	200 mm Soil Core Sonic Rig, Beck Drilling and Environmental Services Ltd.	(OL) ORGANIC SILT, trace rootlets, dark brown, non-cohesive, dry, loose		0.00	1	CORE		⊕					J-Plug Flush Mount Road Box 10/20 Sand
				1050.25									
1		(SM) SILTY SAND, medium brown, non-cohesive, dry, loose		0.61	2	CORE		⊕					
				1049.34									
2		(GM) SILTY GRAVEL, some fine to coarse sand, trace cobbles, light grey, non-cohesive, dry, loose		1.52	3	CORE		⊕					
				1048.42									Hydrated Bentonite Chips
3		(SW) SAND and (GP) GRAVEL, well-graded, trace cobbles, trace silt, medium brown, non-cohesive, wet (likely due to drilling water), loose		2.44	4	CORE		⊕					
		--- Some cobbles from 3.7 to 4.3 m											30 Oct 2012 ▽
4				1046.59									
		SILTSTONE, light grey, cohesive, w<PL, very stiff (BEDROCK)		4.27	5	CORE		⊕					
		--- Dry at 4.3 m											
5													
		--- w>PL (likely due to drilling water) from 5.5 to 6.1 m											10/20 Sand
6													
		--- Trace clay, dark grey to black, black staining, creosote-like odour from 6.1 to 6.7 m			6	CORE		⊕					
		--- Light grey, strong creosote-like odour, no visible staining from 6.1 to 7.9 m			7	CORE					101.8		Slotted Section 10/20 Sand
7													
					8	CORE			□				
8													10/20 Sand
					9	CORE				□			Hydrated Bentonite Chips
				1042.33									
		End of MONITORING WELL.		8.53									
9		NOTES: Standpipe installed to 7.7 m. Measured groundwater level at 3.7 mbgs on October 30, 2012.											
10													

BOREHOLE - EXPANDED ADD. LAB TESTING 11-1324-0164_BHLOGS.GPJ CALGARY.GDT 6/27/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: BS/JMB

CHECKED: JMB

DATA ENTRY: IPG

PROJECT No.: 11-1324-0164

RECORD OF MONITORING WELL: MW11-07

SHEET 1 OF 1

LOCATION: See Location Plan

N: 703203 E: 5659299

BORING DATE: December 14, 2011

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	Soil Vapour Content (ppm) ⊕ 2 4 6 8 / Soil Vapour Content (ppm) □ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp W Wl 10 20 30 40	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Grass		1050.66							
0	200 mm Soil Core Sonic Rig, Beck Drilling and Environmental Services Ltd.	(OH) ORGANIC SILT, some rootlets, dark brown, dry, loose		0.15	1	CORE		⊕			J-Plug Flush Mount Road Box 10/20 Sand
1		(SM) Very fine SILTY SAND, medium brown, non-cohesive, slightly moist, loose			2	CORE		⊕			Hydrated Bentonite Chips
2				1048.53	3	CORE		⊕			10/20 Sand
		(SP) Very fine and fine SAND and (GW) GRAVEL, some cobbles (<100 mm Ø), trace silt, brown, non-cohesive, loose --- Slightly moist from 2.1 to 2.4 m --- Moist from 2.4 to 3.0 m		2.13							
3				1047.61							
		(SM) Very fine SILTY SAND, medium brown, non-cohesive, slightly moist, loose --- Increasing moisture content from moist to wet with depth		3.05	4	CORE		⊕			Slotted Section 10/20 Sand
				1046.70							30 Oct 2012 ▽
4		(SP) Very fine and fine SAND, brown, non-cohesive, moist, loose		3.96	5	CORE		⊕			
				1046.09							10/20 Sand
		(SP) Very fine and fine SAND and (GW) GRAVEL, some cobbles (<80 mm Ø), trace silt, brown, non-cohesive, moist, loose		4.57							
5					6	CORE		⊕			
				1044.87							
		(ML) SILT, some very fine sand, some clay, trace fine and coarse gravel, grey-brown, cohesive, w<PL, stiff --- Trace inclusions of <10 mm Ø green fine-grained sand lenses		5.79							
6					7	CORE		⊕			Hydrated Bentonite Chips
				1043.65							
7		SILTSTONE, grey, cohesive, w<PL, hard (BEDROCK)		7.01							
					8	CORE		⊕			
				1042.74							
8		End of MONITORING WELL.		7.92							
		NOTES: Standpipe installed to 4.4 m. Measured groundwater level at 3.9 mbgs on October 30, 2012.									
9											
10											

BOREHOLE - EXPANDED ADD. LAB TESTING 11-1324-0164_BHLOGS.GPJ CALGARY.GDT 6/27/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: NB

CHECKED: JMB

DATA ENTRY: IPG

PROJECT No.: 11-1324-0164

RECORD OF VAPOUR PROBE: VP11-01B

SHEET 1 OF 1

LOCATION: See Location Plan

N: 702953 E: 5659383

BORING DATE: December 13, 2011

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		Grass											
	200 mm Soil Core Sonic Rig, Beck Drilling and Environmental Services Ltd.	(OH) ORGANIC SILT, some rootlets, dark brown, dry, loose		0.06									J-Plug Flush Mount Road Box 10/20 Sand Hydrated Bentonite Chips
1		(SM) Very fine SILTY SAND, medium brown, non-cohesive, slightly moist, loose											10/20 Sand Vapour Probe
2													Hydrated Bentonite Chips; 10/20 Sand Vapour Probe
		End of VAPOUR PROBE.		2.74									
3		NOTES: Borehole dry upon completion.											
4													
5													
6													
7													
8													
9													
10													

BOREHOLE - EXPANDED ADD. LAB TESTING 11-1324-0164_BHLOGS.GPJ CALGARY.GDT 6/27/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: NB

CHECKED: JMB

DATA ENTRY: IPG

PROJECT No.: 11-1324-0164

RECORD OF VAPOUR PROBE: VP11-02

SHEET 1 OF 1

LOCATION: See Location Plan

N: 702993 E: 5659397

BORING DATE: December 15, 2011

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	Soil Vapour Content (ppm) ⊕ 2 4 6 8 / Soil Vapour Content (ppm) □ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp W Wl 10 20 30 40	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		Grass									
	200 mm Soil Core Sonic Rig, Beck Drilling and Environmental Services Ltd.	(OL) ORGANIC SILT, some very fine-grained sand, trace rootlets, medium brown, non-cohesive, dry, loose		0.00	1	CORE		⊕			Flush Mount Road Box; 10/20 Sand; Hydrated Bentonite Chips
1		(SM) SILTY SAND, some coarse and fine-grained sand, medium brown, non-cohesive, dry, loose --- Moist from 0.9 to 1.5 m		0.61	2	CORE		⊕			10/20 Sand Vapour Probe; Hydrated Bentonite Chips
2					3	CORE		⊕			10/20 Sand Vapour Probe; Hydrated Bentonite Chips
3		NO RECOVERY		2.74							
		End of VAPOUR PROBE. NOTES: Borehole dry upon completion.		3.05							
4											
5											
6											
7											
8											
9											
10											

BOREHOLE - EXPANDED ADD. LAB TESTING 11-1324-0164_BHLOGS.GPJ CALGARY.GDT 6/27/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: BS

CHECKED: JMB

DATA ENTRY: IPG

PROJECT No.: 11-1324-0164

RECORD OF VAPOUR PROBE: VP11-03B

SHEET 1 OF 1

LOCATION: See Location Plan

N: 703085 E: 5659399

BORING DATE: December 16, 2011

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	Soil Vapour Content (ppm) ⊕ 2 4 6 8 / Soil Vapour Content (ppm) □ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp W Wl 10 20 30 40	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	200 mm Soil Core Sonic Rig, Beck Drilling and Environmental Services Ltd.	Grass									
		(OL) ORGANIC SILT, trace rootlets, dark brown, non-cohesive, wet (likely due to drilling water), loose		0.00	1	CORE		⊕			J-Plug Flush Mount Road Box 10/20 Sand Hydrated Bentonite Chips
		(SW) SAND and (GP) GRAVEL, well-graded, medium brown, non-cohesive, moist, loose		0.15							
1					2	CORE		⊕			10/20 Sand Vapour Probe
2											Hydrated Bentonite Chips
		--- Some silt, light grey, dry from 2.4 m									10/20 Sand Vapour Probe Hydrated Bentonite Chips
3					3	CORE		⊕			
		End of VAPOUR PROBE.		3.05							
		NOTES: Borehole dry upon completion.									
4											
5											
6											
7											
8											
9											
10											

BOREHOLE - EXPANDED ADD. LAB TESTING 11-1324-0164_BHLOGS.GPJ CALGARY.GDT 6/27/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: BS

CHECKED: JMB

DATA ENTRY: IPG

PROJECT No.: 11-1324-0164

RECORD OF VAPOUR PROBE: VP11-04B

SHEET 1 OF 1

LOCATION: See Location Plan

N: 702995 E: 5659334

BORING DATE: December 14, 2011

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		Gravel											
	200 mm Soil Core Sonic Rig Beck Drilling and Environmental Services Ltd.	NO RECOVERY due to hydrovac, likely sand and gravel, some cobbles		0.00									J-Plug Flush Mount Road Box 10/20 Sand Hydrated Bentonite Chips 10/20 Sand Vapour Probe Hydrated Bentonite Chips 10/20 Sand Vapour Probe Sloughing
1													
2		(SP) Very fine and fine SAND and fine and coarse (GW) GRAVEL, trace cobbles (<70 mm Ø), trace silt, brown, non-cohesive, slightly moist, loose		1.68									
		End of VAPOUR PROBE. NOTES: Borehole dry upon completion.		2.74									
3													
4													
5													
6													
7													
8													
9													
10													

BOREHOLE - EXPANDED ADD. LAB TESTING 11-1324-0164_BHLOGS.GPJ CALGARY.GDT 6/27/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: NB

CHECKED: JMB

DATA ENTRY: IPG

PROJECT No.: 11-1324-0164

RECORD OF VAPOUR PROBE: VP11-08

SHEET 1 OF 1

LOCATION: See Location Plan

N: 703294 E: 5659362

BORING DATE: December 14, 2011

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	Soil Vapour Content (ppm) ⊕ 2 4 6 8 / Soil Vapour Content (ppm) □ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp W Wl 10 20 30 40	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	200 mm Soil Core Sonic Rig, Beck Drilling and Environmental Services Ltd.	Asphalt ASPHALT NO RECOVERY due to hydrovac, likely sand and gravel, some cobbles		0.08							J-Plug Flush Mount Road Box 10/20 Sand Hydrated Bentonite Chips
1		(SP) Very fine and fine SAND and (GW) GRAVEL, some cobbles (<10 mm Ø), brown, non-cohesive, slightly moist, soft		1.22							10/20 Sand Vapour Probe
2		(SM) Very fine and fine SILTY SAND, medium brown, cohesive, w<PL, moist, soft		1.52	1	CORE		⊕			Hydrated Bentonite Chips 10/20 Sand Vapour Probe
3		(SP) Very fine and fine SAND and (GW) GRAVEL, some cobbles (<10 mm Ø), brown, non-cohesive, slightly moist, soft		2.44							
		End of VAPOUR PROBE. NOTES: Borehole dry upon completion.		2.59							
4											
5											
6											
7											
8											
9											
10											

BOREHOLE - EXPANDED ADD. LAB TESTING 11-1324-0164_BHLOGS.GPJ CALGARY.GDT 6/27/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: NB

CHECKED: JMB

DATA ENTRY: IPG

PROJECT No.: 11-1324-0164

RECORD OF VAPOUR PROBE: VP11-09

SHEET 1 OF 1

LOCATION: See Location Plan

N: 703369 E: 5659361

BORING DATE: December 14, 2011

DATUM: UTM Zone 11 (Nad 83)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	Soil Vapour Content (ppm) ⊕ 2 4 6 8	Soil Vapour Content (ppm) □ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3}	WATER CONTENT PERCENT Wp W Wl 10 20 30 40	FIELD EC AND ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	200 mm Soil Core Sonic Rig, Beck Drilling and Environmental Services Ltd.	Asphalt ASPHALT		0.00 0.10									J-Plug Flush Mount Road Box 10/20 Sand Hydrated Bentonite Chips
1		NO RECOVERY due to hydrovac, likely sand and gravel, some cobbles											
		(SM) Very fine and fine SILTY SAND, medium brown, cohesive, w~PL, soft		1.22									10/20 Sand Vapour Probe
2		(ML) SILT, some sand, medium brown, cohesive, w~PL, soft		1.83									Hydrated Bentonite Chips
		(SM) Very fine and fine SILTY SAND, medium brown, cohesive, w~PL, soft --- Rusty colour from 2.7 to 3.0 m		2.13	1	CORE		⊕					10/20 Sand Vapour Probe Hydrated Bentonite Chips
3		End of VAPOUR PROBE.		3.05									
4		NOTES: Borehole dry upon completion.											
5													
6													
7													
8													
9													
10													

BOREHOLE - EXPANDED ADD. LAB TESTING 11-1324-0164_BHLOGS.GPJ CALGARY.GDT 6/27/14

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: NB

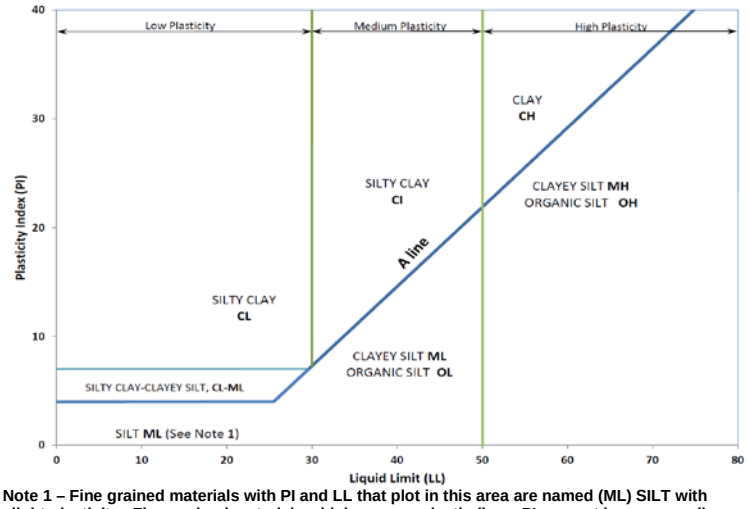
CHECKED: JMB

METHOD OF SOIL CLASSIFICATION

The Golder Associates Ltd. Soil Classification System is based on the Unified Soil Classification System (USCS)

Organic or Inorganic	Soil Group	Type of Soil		Gradation or Plasticity	$Cu = \frac{D_{60}}{D_{10}}$	$Cc = \frac{(D_{30})^2}{D_{10} x D_{60}}$	Organic Content	USCS Group Symbol	Group Name
INORGANIC (Organic Content ≤30% by mass)	COARSE-GRAINED SOILS (>50% by mass is larger than 0.075 mm)	GRAVELS (>50% by mass of coarse fraction is larger than 4.75 mm)	Gravels with ≤12% fines (by mass)	Poorly Graded	<4	≤1 or ≥3	≤30%	GP	GRAVEL
				Well Graded	≥4	1 to 3		GW	GRAVEL
			Gravels with >12% fines (by mass)	Below A Line	n/a			GM	SILTY GRAVEL
				Above A Line	n/a			GC	CLAYEY GRAVEL
		SANDS (≥50% by mass of coarse fraction is smaller than 4.75 mm)	Sands with ≤12% fines (by mass)	Poorly Graded	<6	≤1 or ≥3		SP	SAND
				Well Graded	≥6	1 to 3		SW	SAND
			Sands with >12% fines (by mass)	Below A Line	n/a			SM	SILTY SAND
				Above A Line	n/a			SC	CLAYEY SAND

Organic or Inorganic	Soil Group	Type of Soil		Laboratory Tests	Field Indicators					Organic Content	USCS Group Symbol	Primary Name
					Dilatancy	Dry Strength	Shine Test	Thread Diameter	Toughness (of 3 mm thread)			
INORGANIC (Organic Content ≤30% by mass)	FINE-GRAINED SOILS (≥50% by mass is smaller than 0.075 mm)	SILTS (Non-Plastic or PI and LL plot below A-Line on Plasticity Chart below)		Liquid Limit <50	Rapid	None	None	>6 mm	N/A (can't roll 3 mm thread)	<5%	ML	SILT
					Slow	None to Low	Dull	3mm to 6 mm	None to low	<5%	ML	CLAYEY SILT
					Slow to very slow	Low to medium	Dull to slight	3mm to 6 mm	Low	5% to 30%	OL	ORGANIC SILT
				Liquid Limit ≥50	Slow to very slow	Low to medium	Slight	3mm to 6 mm	Low to medium	<5%	MH	CLAYEY SILT
					None	Medium to high	Dull to slight	1 mm to 3 mm	Medium to high	5% to 30%	OH	ORGANIC SILT
		CLAYS (PI and LL plot above A-Line on Plasticity Chart below)		Liquid Limit <30	None	Low to medium	Slight to shiny	~ 3 mm	Low to medium	0% to 30% (see Note 2)	CL	SILTY CLAY
				Liquid Limit 30 to 50	None	Medium to high	Slight to shiny	1 mm to 3 mm	Medium		CI	SILTY CLAY
				Liquid Limit ≥50	None	High	Shiny	<1 mm	High		CH	CLAY
HIGHLY ORGANIC SOILS (Organic Content >30% by mass)		Peat and mineral soil mixtures								30% to 75%	PT	SILTY PEAT, SANDY PEAT
		Predominantly peat, may contain some mineral soil, fibrous or amorphous peat								75% to 100%		PEAT



Note 1 – Fine grained materials with PI and LL that plot in this area are named (ML) SILT with slight plasticity. Fine-grained materials which are non-plastic (i.e. a PL cannot be measured) are named SILT.
Note 2 – For soils with <5% organic content, include the descriptor "trace organics" for soils with between 5% and 30% organic content include the prefix "organic" before the Primary name.

Dual Symbol — A dual symbol is two symbols separated by a hyphen, for example, GP-GM, SW-SC and CL-ML.
For non-cohesive soils, the dual symbols must be used when the soil has between 5% and 12% fines (i.e. to identify transitional material between "clean" and "dirty" sand or gravel.
For cohesive soils, the dual symbol must be used when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart (see Plasticity Chart at left).

Borderline Symbol — A borderline symbol is two symbols separated by a slash, for example, CL/CI, GM/SM, CL/ML.
A borderline symbol should be used to indicate that the soil has been identified as having properties that are on the transition between similar materials. In addition, a borderline symbol may be used to ~~or~~ indicate~~s~~ a range of similar soil types within a stratum.

ABBREVIATIONS AND TERMS USED ON RECORDS OF BOREHOLES AND TEST PITS

PARTICLE SIZES OF CONSTITUENTS

Soil Constituent	Particle Size Description	Millimetres	Inches (US Std. Sieve Size)
BOULDERS	Not Applicable	>300	>12
COBBLES	Not Applicable	75 to 300	3 to 12
GRAVEL	Coarse Fine	19 to 75 4.75 to 19	0.75 to 3 (4) to 0.75
SAND	Coarse Medium Fine	2.00 to 4.75 0.425 to 2.00 0.075 to 0.425	(10) to (4) (40) to (10) (200) to (40)
SILT/CLAY	Classified by plasticity	<0.075	< (200)

MODIFIERS FOR SECONDARY AND MINOR CONSTITUENTS

Percentage by Mass	Modifier
>35	Use 'and' to combine major constituents (*i.e.,* SAND and GRAVEL, SAND and CLAY)
> 12 to 35	Primary soil name prefixed with "gravelly, sandy, SILTY, CLAYEY" as applicable
> 5 to 12	some
≤ 5	trace

PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split-spoon sampler for a distance of 300 mm (12 in.).

Cone Penetration Test (CPT)

An electronic cone penetrometer with a 60° conical tip and a project end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and sleeve frictions are recorded electronically at 25 mm penetration intervals.

Dynamic Cone Penetration Resistance (DCPT); N_d:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH: Sampler advanced by hydraulic pressure
PM: Sampler advanced by manual pressure
WH: Sampler advanced by static weight of hammer
WR: Sampler advanced by weight of sampler and rod

SAMPLES

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO or DP	Seamless open ended, driven or pushed tube sampler – note size
DS	Denison type sample
FS	Foil sample
RC	Rock core
SC	Soil core
SS	Split spoon sampler – note size
ST	Slotted tube
TO	Thin-walled, open – note size
TP	Thin-walled, piston – note size
WS	Wash sample

SOIL TESTS

w	water content
PL , w_p	plastic limit
LL , w_L	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test[1]
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	relative density (specific gravity, Gs)
DS	direct shear test
GS	specific gravity
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO_4	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V (FV)	field vane (LV-laboratory vane test)
γ	unit weight

1. Tests which are anisotropically consolidated prior to shear are shown as CAD, CAU.

NON-COHESIVE (COHESIONLESS) SOILS

Compactness[2]

Term	SPT 'N' (blows/0.3m)[1]
Very Loose	0 - 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	>50

1. SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects.
2. Definition of compactness descriptions based on SPT 'N' ranges from Terzaghi and Peck (1967) and correspond to typical average N_{60} values.

Field Moisture Condition

Term	Description
Dry	Soil flows freely through fingers.
Moist	Soils are darker than in the dry condition and may feel cool.
Wet	As moist, but with free water forming on hands when handled.

COHESIVE SOILS

Consistency

Term	Undrained Shear Strength (kPa)	SPT 'N'[1] (blows/0.3m)
Very Soft	<12	0 to 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	>200	>30

1. SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects; approximate only.

Water Content

Term	Description
w < PL	Material is estimated to be drier than the Plastic Limit.
w ~ PL	Material is estimated to be close to the Plastic Limit.
w > PL	Material is estimated to be wetter than the Plastic Limit.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$	x or log x, logarithm of x to base 10
g	acceleration due to gravity
t	time

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta\sigma$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
υ	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial effective overburden stress
σ_1, σ_2, σ_3	principal stress (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3)/3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) (formerly G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_l or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity index = $(w_l - w_p)$
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_C	consistency index = $(w_l - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (over-consolidated range)
C_s	swelling index
C_α	secondary compression index
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
c_h	coefficient of consolidation (horizontal direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	over-consolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p, τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c′	effective cohesion
c_u, s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3)/2$
p′	mean effective stress $(\sigma'_1 + \sigma'_3)/2$
q	$(\sigma_1 - \sigma_3)/2$ or $(\sigma'_1 - \sigma'_3)/2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes: 1 $\tau = c' + \sigma' \tan \phi'$

2 shear strength = (compressive strength)/2

APPENDIX B

Laboratory Reports

CERTIFICATE OF ANALYSIS

CLIENT	**Golder Associates Ltd. (Calgary)**		
	102-2535 3rd Avenue SE		
	Calgary AB	TEL	1-403-532-5798
	T2A 7W5	FAX	1-403-299-5606
ATTENTION	**Julie Burghardt**		

RECEIVED / TEMP	Nov-14-12 10:00 / 5.0 °C	**WORK ORDER**	2110724
REPORTED	Nov-30-12	**PROJECT**	11-1324-0164
COC #(s)	00253, 00252, 00251	**PROJECT INFO**	Canada Creosote

General Comments:

CARO Analytical Services employs methods which are based on those found in "Standard Methods for the Examination of Water and Wastewater", 21st Edition, 2005, published by the American Public Health Association (APHA); US EPA protocols found in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846", 3rd Edition; protocols published by the British Columbia Ministry of Environment (BCMOE); and/or CCME Canada-wide Standard Reference methods.

Methods not described in these publications are conducted according to procedures accepted by appropriate regulatory agencies, and/or are done in accordance with recognized professional standards using accepted testing methodologies and quality control efforts except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

- All solids results are reported on a dry weight basis unless otherwise noted

- Units: mg/kg = milligrams per kilogram, equivalent to parts per million (ppm)
  mg/L = milligrams per litre, equivalent to parts per million (ppm)
  ug/L = micrograms per litre, equivalent to parts per billion (ppb)
  ug/g = micrograms per gram, equivalent to parts per million (ppm)
  ug/m3 = micrograms per cubic meter of air

- "RDL" Reported detection limit
- "<" Less than reported detection limit
- "AO" Aesthetic objective
- "MAC" Maximum acceptable concentration (health-related guideline)
- "LAB" RMD = Richmond location, KEL = Kelowna location, EDM = Edmonton location, SUB = Subcontracted

Please contact CARO if more information is needed or to provide feedback on our services.

CARO Analytical Services

Final Review Per: **Paul Thandi, B.Sc., PChem For Brent Coates, B.Sc.**
Business Manager, Richmond

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SAMPLE DATA

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-01-P (2110724-01) Matrix: Air Sampled: Nov-10-12 15:51

Sampling Flow (mL/min): 203 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 330	330	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 660	660	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 660	660	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	**3.6**	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**0.95**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	**0.16**	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	**0.39**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 0.99	0.99	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**5.3**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-01-P (2110724-01) Matrix: Air Sampled: Nov-10-12 15:51, Continued

Sampling Flow (mL/min): 203 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	**4.6**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	**4.6**	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**1.3**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*102 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

SAMPLE DATA

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-3B-W (2110724-02) Matrix: Air Sampled: Nov-10-12 14:50

Sampling Flow (mL/min): 211 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**190**	160	ug/m3 Air	Nov-17-12	Nov-22-12	
nC6-nC8 (aromatic)	**6.0**	3.2	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	**190**	160	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-22-12	
nC8-nC10 (aromatic)	**5.4**	3.2	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	**350**	320	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (total)	**160**	160	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (aromatic)	**20**	3.2	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 320	320	ug/m3 Air	Nov-17-12	Nov-22-12	
nC12-nC16 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 320	320	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	**350**	320	ug/m3 Air	Nov-17-12	Nov-22-12	
VHv (6-13)	< 630	630	ug/m3 Air	Nov-17-12	Nov-22-12	
VPHv	< 630	630	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-22-12	
Acrylonitrile	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Allyl chloride	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Benzene	**1.3**	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromodichloromethane	**0.60**	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromoform	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Butanone (MEK)	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon disulfide	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon tetrachloride	< 0.095	0.095	ug/m3 Air	Nov-17-12	Nov-22-12	
Chlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroethane	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroform	**79**	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Chlorotoluene	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Decane	< 0.95	0.95	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromo-3-chloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromochloromethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromoethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromomethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,4-Dichloro-2-butene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,4-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Dichlorodifluoromethane	**3.8**	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloroethane	< 0.095	0.095	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethene	**0.13**	0.095	ug/m3 Air	Nov-17-12	Nov-22-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-3B-W (2110724-02) Matrix: Air Sampled: Nov-10-12 14:50, Continued

Sampling Flow (mL/min): 211 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl acetate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethylbenzene	**0.47**	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl ether	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachlorobutadiene	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl methacrylate	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Hexane	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-22-12	
Isopropylbenzene (Cumene)	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Methacrylonitrile	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl acrylate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl cyclohexane	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl tert-butyl ether	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
Methylene chloride	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl methacrylate	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
4-Methyl-2-Pentanone (MIBK)	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
Naphthalene	**20**	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Nitrobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Styrene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1,2-Tetrachloroethane	**0.47**	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrahydrofuran	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1-Trichloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Toluene	**4.7**	3.2	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichloroethene	**0.095**	0.095	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichlorofluoromethane	**0.92**	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,3-Trichloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trimethylbenzene	**1.9**	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3,5-Trimethylbenzene	**0.76**	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
Vinyl chloride	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-22-12	
Xylenes (total)	**2.8**	1.6	ug/m3 Air	Nov-17-12	Nov-22-12	
Surrogate: Toluene-d8	*98 %*	*66-122*		*Nov-17-12*	*Nov-22-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-3B-S (2110724-03) Matrix: Air Sampled: Nov-10-12 15:22

Sampling Flow (mL/min): 202 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC6-nC8 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC8-nC10 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-22-12	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 330	330	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-22-12	
VHv (6-13)	< 660	660	ug/m3 Air	Nov-17-12	Nov-22-12	
VPHv	< 660	660	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-22-12	
Acrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Allyl chloride	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Benzene	**0.89**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromodichloromethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromoform	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Butanone (MEK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon disulfide	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon tetrachloride	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-22-12	
Chlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroethane	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroform	**0.73**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Chlorotoluene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Decane	< 0.99	0.99	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromomethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Dichlorodifluoromethane	**5.0**	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloroethane	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethene	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-22-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-3B-S (2110724-03) Matrix: Air Sampled: Nov-10-12 15:22, Continued

Sampling Flow (mL/min): 202 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloropropane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl acetate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethylbenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachlorobutadiene	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Hexane	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-22-12	
Isopropylbenzene (Cumene)	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl acrylate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl cyclohexane	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl tert-butyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
Methylene chloride	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl methacrylate	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
4-Methyl-2-Pentanone (MIBK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
Naphthalene	**0.50**	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Nitrobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Styrene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1,2-Tetrachloroethane	**0.33**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2,2-Tetrachloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrachloroethene	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Toluene	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2-Trichloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichloroethene	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichlorofluoromethane	**1.1**	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trimethylbenzene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3,5-Trimethylbenzene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
Vinyl chloride	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-22-12	
Xylenes (total)	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Surrogate: Toluene-d8	*102 %*	*66-122*		*Nov-17-12*	*Nov-22-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-3B-D (2110724-04) Matrix: Air Sampled: Nov-10-12 15:05

Sampling Flow (mL/min): 202 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 330	330	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 660	660	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 660	660	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**0.99**	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	**0.20**	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	**36**	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 0.99	0.99	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**5.0**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-3B-D (2110724-04) Matrix: Air Sampled: Nov-10-12 15:05, Continued

Sampling Flow (mL/min): 202 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	**0.53**	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**1.2**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*95 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-5-P (2110724-05) Matrix: Air Sampled: Nov-10-12 13:33

Sampling Flow (mL/min): 206 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 320	320	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 320	320	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 320	320	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 320	320	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 650	650	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 650	650	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**2.3**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	< 0.097	0.097	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 0.97	0.97	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromo-3-chloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**4.9**	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.097	0.097	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	< 0.097	0.097	ug/m3 Air	Nov-17-12	Nov-23-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-5-P (2110724-05) Matrix: Air Sampled: Nov-10-12 13:33, Continued

Sampling Flow (mL/min): 206 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	**1.8**	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	**0.23**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.097	0.097	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**0.71**	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*100 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-6-W (2110724-06) Matrix: Air Sampled: Nov-10-12 17:11

Sampling Flow (mL/min): 196 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**370**	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC6-nC8 (aromatic)	**9.9**	3.4	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	**340**	170	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	**480**	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC8-nC10 (aromatic)	**200**	34	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	**270**	170	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	**850**	340	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (total)	**950**	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (aromatic)	**240**	3.4	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	**710**	170	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 340	340	ug/m3 Air	Nov-17-12	Nov-22-12	
nC12-nC16 (aromatic)	< 3.4	3.4	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 340	340	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	**1300**	340	ug/m3 Air	Nov-17-12	Nov-22-12	
VHv (6-13)	**1700**	680	ug/m3 Air	Nov-17-12	Nov-22-12	
VPHv	**1700**	680	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.4	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Acrylonitrile	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Allyl chloride	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Benzene	**1.8**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromodichloromethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromoform	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Butanone (MEK)	< 0.68	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon disulfide	< 0.68	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon tetrachloride	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
Chlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroethane	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroform	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Chlorotoluene	< 0.68	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Decane	**13**	1.0	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromo-3-chloropropane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromochloromethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromoethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromomethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,4-Dichloro-2-butene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,4-Dichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Dichlorodifluoromethane	**5.1**	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloroethane	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethene	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-6-W (2110724-06) Matrix: Air Sampled: Nov-10-12 17:11, Continued

Sampling Flow (mL/min): 196 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	**1.3**	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,2-Dichloroethene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloropropane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl acetate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethylbenzene	**5.1**	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl ether	< 0.68	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachlorobutadiene	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl methacrylate	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachloroethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Hexane	**5.1**	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Isopropylbenzene (Cumene)	**2.7**	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Methacrylonitrile	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl acrylate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl cyclohexane	**12**	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl tert-butyl ether	< 0.68	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
Methylene chloride	< 3.4	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl methacrylate	< 0.68	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
4-Methyl-2-Pentanone (MIBK)	< 0.68	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
Naphthalene	**190**	3.4	ug/m3 Air	Nov-17-12	Nov-24-12	RA2
Nitrobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Styrene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1,2-Tetrachloroethane	**1.2**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2,2-Tetrachloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrachloroethene	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrahydrofuran	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1-Trichloroethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Toluene	**7.8**	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2-Trichloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichloroethene	**0.51**	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichlorofluoromethane	**0.65**	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,3-Trichloropropane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trimethylbenzene	**44**	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3,5-Trimethylbenzene	**26**	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
Vinyl chloride	< 0.68	0.68	ug/m3 Air	Nov-17-12	Nov-22-12	
Xylenes (total)	**23**	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Surrogate: Toluene-d8	*118 %*	*66-122*		*Nov-17-12*	*Nov-22-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-11-W (2110724-07) Matrix: Air Sampled: Nov-10-12 13:00

Sampling Flow (mL/min): 216 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**220**	150	ug/m3 Air	Nov-17-12	Nov-22-12	
nC6-nC8 (aromatic)	**65**	3.1	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	**150**	150	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	**150**	150	ug/m3 Air	Nov-17-12	Nov-22-12	
nC8-nC10 (aromatic)	**13**	3.1	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 150	150	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	**370**	310	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (total)	**250**	150	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (aromatic)	**46**	3.1	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	**200**	150	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 310	310	ug/m3 Air	Nov-17-12	Nov-22-12	
nC12-nC16 (aromatic)	< 3.1	3.1	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 310	310	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 310	310	ug/m3 Air	Nov-17-12	Nov-22-12	
VHv (6-13)	< 620	620	ug/m3 Air	Nov-17-12	Nov-22-12	
VPHv	< 620	620	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.1	3.1	ug/m3 Air	Nov-17-12	Nov-22-12	
Acrylonitrile	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Allyl chloride	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Benzene	**0.65**	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromodichloromethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromoform	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Butanone (MEK)	< 0.62	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon disulfide	< 0.62	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon tetrachloride	**0.12**	0.093	ug/m3 Air	Nov-17-12	Nov-22-12	
Chlorobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroethane	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroform	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Chlorotoluene	< 0.62	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Decane	< 1.9	1.9	ug/m3 Air	Nov-17-12	Nov-22-12	RA3
1,2-Dibromo-3-chloropropane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromochloromethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromoethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromomethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,4-Dichloro-2-butene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichlorobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichlorobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,4-Dichlorobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Dichlorodifluoromethane	**4.9**	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloroethane	< 0.093	0.093	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethene	< 0.093	0.093	ug/m3 Air	Nov-17-12	Nov-22-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-11-W (2110724-07) Matrix: Air Sampled: Nov-10-12 13:00, Continued

Sampling Flow (mL/min): 216 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,2-Dichloroethene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloropropane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl acetate	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethylbenzene	**0.31**	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl ether	< 0.62	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachlorobutadiene	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl methacrylate	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachloroethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Hexane	< 3.1	3.1	ug/m3 Air	Nov-17-12	Nov-22-12	
Isopropylbenzene (Cumene)	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Methacrylonitrile	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl acrylate	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl cyclohexane	< 0.62	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl tert-butyl ether	< 0.62	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
Methylene chloride	< 3.1	3.1	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl methacrylate	< 0.62	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
4-Methyl-2-Pentanone (MIBK)	< 0.62	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
Naphthalene	**46**	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Nitrobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Styrene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1,2-Tetrachloroethane	**0.22**	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2,2-Tetrachloroethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrachloroethene	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrahydrofuran	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1-Trichloroethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
Toluene	**65**	3.1	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trichlorobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2-Trichloroethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichloroethene	< 0.093	0.093	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichlorofluoromethane	**1.1**	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,3-Trichloropropane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trimethylbenzene	**4.3**	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3,5-Trimethylbenzene	**1.9**	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
Vinyl chloride	< 0.62	0.62	ug/m3 Air	Nov-17-12	Nov-22-12	
Xylenes (total)	**1.7**	1.5	ug/m3 Air	Nov-17-12	Nov-22-12	
Surrogate: Toluene-d8	*113 %*	*66-122*		*Nov-17-12*	*Nov-22-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-15-W (2110724-08) Matrix: Air Sampled: Nov-10-12 14:13

Sampling Flow (mL/min): 199 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC6-nC8 (aromatic)	< 3.4	3.4	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC8-nC10 (aromatic)	**4.4**	3.4	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 340	340	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (total)	**200**	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (aromatic)	**33**	3.4	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	**170**	170	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 340	340	ug/m3 Air	Nov-17-12	Nov-22-12	
nC12-nC16 (aromatic)	< 3.4	3.4	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 340	340	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 340	340	ug/m3 Air	Nov-17-12	Nov-22-12	
VHv (6-13)	< 670	670	ug/m3 Air	Nov-17-12	Nov-22-12	
VPHv	< 670	670	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.4	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Acrylonitrile	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Allyl chloride	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Benzene	**1.2**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromodichloromethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromoform	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Butanone (MEK)	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon disulfide	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon tetrachloride	**0.17**	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
Chlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroethane	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroform	**0.64**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Chlorotoluene	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Decane	< 1.0	1.0	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromo-3-chloropropane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromochloromethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromoethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromomethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,4-Dichloro-2-butene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,4-Dichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Dichlorodifluoromethane	**5.0**	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloroethane	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethene	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-15-W (2110724-08) Matrix: Air Sampled: Nov-10-12 14:13, Continued

Sampling Flow (mL/min): 199 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,2-Dichloroethene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloropropane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl acetate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethylbenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl ether	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachlorobutadiene	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl methacrylate	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachloroethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Hexane	< 3.4	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Isopropylbenzene (Cumene)	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Methacrylonitrile	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl acrylate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl cyclohexane	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl tert-butyl ether	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Methylene chloride	< 3.4	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl methacrylate	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
4-Methyl-2-Pentanone (MIBK)	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Naphthalene	**33**	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Nitrobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Styrene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1,2-Tetrachloroethane	**0.17**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2,2-Tetrachloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrachloroethene	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrahydrofuran	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1-Trichloroethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Toluene	< 3.4	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2-Trichloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichloroethene	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichlorofluoromethane	**1.1**	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,3-Trichloropropane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trimethylbenzene	**2.6**	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3,5-Trimethylbenzene	**1.0**	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Vinyl chloride	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Xylenes (total)	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Surrogate: Toluene-d8	*104 %*	*66-122*		*Nov-17-12*	*Nov-22-12*	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-16A (2110724-09) Matrix: Air Sampled: Nov-09-12 11:54

Sampling Flow (mL/min): 225 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 150	150	ug/m3 Air	Nov-17-12	Nov-22-12	
nC6-nC8 (aromatic)	**15**	3.0	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 150	150	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 150	150	ug/m3 Air	Nov-17-12	Nov-22-12	
nC8-nC10 (aromatic)	**5.0**	3.0	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 150	150	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 300	300	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (total)	**240**	150	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (aromatic)	< 3.0	3.0	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	**240**	150	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 300	300	ug/m3 Air	Nov-17-12	Nov-22-12	
nC12-nC16 (aromatic)	< 3.0	3.0	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 300	300	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 300	300	ug/m3 Air	Nov-17-12	Nov-22-12	
VHv (6-13)	< 590	590	ug/m3 Air	Nov-17-12	Nov-22-12	
VPHv	< 590	590	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	**3.3**	3.0	ug/m3 Air	Nov-17-12	Nov-22-12	
Acrylonitrile	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Allyl chloride	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Benzene	**0.80**	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromodichloromethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromoform	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Butanone (MEK)	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon disulfide	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon tetrachloride	< 0.089	0.089	ug/m3 Air	Nov-17-12	Nov-22-12	
Chlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroethane	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroform	**0.15**	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Chlorotoluene	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Decane	**2.2**	0.89	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromo-3-chloropropane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromochloromethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromoethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromomethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,4-Dichloro-2-butene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,4-Dichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Dichlorodifluoromethane	**4.4**	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloroethane	< 0.089	0.089	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethene	< 0.089	0.089	ug/m3 Air	Nov-17-12	Nov-22-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-16A (2110724-09) Matrix: Air Sampled: Nov-09-12 11:54, Continued

Sampling Flow (mL/min): 225 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,2-Dichloroethene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloropropane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl acetate	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethylbenzene	**0.47**	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl ether	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachlorobutadiene	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl methacrylate	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachloroethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Hexane	< 3.0	3.0	ug/m3 Air	Nov-17-12	Nov-22-12	
Isopropylbenzene (Cumene)	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Methacrylonitrile	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl acrylate	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl cyclohexane	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl tert-butyl ether	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
Methylene chloride	< 3.0	3.0	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl methacrylate	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
4-Methyl-2-Pentanone (MIBK)	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
Naphthalene	**0.47**	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Nitrobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Styrene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1,2-Tetrachloroethane	**2.3**	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2,2-Tetrachloroethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrachloroethene	**2.3**	1.5	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrahydrofuran	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1-Trichloroethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
Toluene	**15**	3.0	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2-Trichloroethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichloroethene	**0.18**	0.089	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichlorofluoromethane	**0.92**	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,3-Trichloropropane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trimethylbenzene	**1.8**	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3,5-Trimethylbenzene	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
Vinyl chloride	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-22-12	
Xylenes (total)	**2.8**	1.5	ug/m3 Air	Nov-17-12	Nov-22-12	
Surrogate: Toluene-d8	*99 %*	*66-122*		*Nov-17-12*	*Nov-22-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-16B (2110724-10) Matrix: Air Sampled: Nov-09-12 11:54

Sampling Flow (mL/min): 225 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 150	150	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	< 3.0	3.0	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 150	150	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 150	150	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	< 3.0	3.0	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 150	150	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 300	300	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 150	150	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.0	3.0	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 150	150	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 300	300	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.0	3.0	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 300	300	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 300	300	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 590	590	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 590	590	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.0	3.0	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**0.53**	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	< 0.089	0.089	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 1.8	1.8	ug/m3 Air	Nov-17-12	Nov-23-12	RA3
1,2-Dibromo-3-chloropropane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.089	0.089	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	< 0.089	0.089	ug/m3 Air	Nov-17-12	Nov-23-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-16B (2110724-10) Matrix: Air Sampled: Nov-09-12 11:54, Continued

Sampling Flow (mL/min): 225 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.0	3.0	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.0	3.0	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	< 3.0	3.0	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.089	0.089	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	**1.0**	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	**1.6**	1.5	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*100 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-22A (2110724-11) Matrix: Air Sampled: Nov-09-12 12:50

Sampling Flow (mL/min): 232 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 140	140	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**9.5**	2.9	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 140	140	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	**170**	140	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	**6.0**	2.9	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	**150**	140	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	**290**	290	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	**260**	140	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 2.9	2.9	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	**260**	140	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 290	290	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 2.9	2.9	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 290	290	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 290	290	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 570	570	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 570	570	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 2.9	2.9	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**0.78**	0.14	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	< 0.086	0.086	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.4	1.4	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	**2.6**	0.86	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromo-3-chloropropane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**4.9**	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.086	0.086	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	< 0.086	0.086	ug/m3 Air	Nov-17-12	Nov-23-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-22A (2110724-11) Matrix: Air Sampled: Nov-09-12 12:50, Continued

Sampling Flow (mL/min): 232 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.4	1.4	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	**0.58**	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 2.9	2.9	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.4	1.4	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 2.9	2.9	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	**0.40**	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	**1.2**	0.14	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.4	1.4	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	**0.32**	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**8.6**	2.9	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.086	0.086	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**1.1**	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	**2.1**	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	**3.5**	1.4	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*102 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-22B (2110724-12) Matrix: Air Sampled: Nov-09-12 12:50

Sampling Flow (mL/min): 232 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 140	140	ug/m3 Air	Nov-17-12	Nov-22-12	
nC6-nC8 (aromatic)	< 2.9	2.9	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 140	140	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 140	140	ug/m3 Air	Nov-17-12	Nov-22-12	
nC8-nC10 (aromatic)	**3.5**	2.9	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 140	140	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 290	290	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (total)	< 140	140	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (aromatic)	< 2.9	2.9	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 140	140	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 290	290	ug/m3 Air	Nov-17-12	Nov-22-12	
nC12-nC16 (aromatic)	< 2.9	2.9	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 290	290	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 290	290	ug/m3 Air	Nov-17-12	Nov-22-12	
VHv (6-13)	< 570	570	ug/m3 Air	Nov-17-12	Nov-22-12	
VPHv	< 570	570	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	**3.2**	2.9	ug/m3 Air	Nov-17-12	Nov-22-12	
Acrylonitrile	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Allyl chloride	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-22-12	
Benzene	**0.63**	0.14	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromodichloromethane	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromoform	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Butanone (MEK)	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon disulfide	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon tetrachloride	< 0.086	0.086	ug/m3 Air	Nov-17-12	Nov-22-12	
Chlorobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroethane	< 1.4	1.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroform	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Chlorotoluene	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Decane	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	RA3
1,2-Dibromo-3-chloropropane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromochloromethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromoethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromomethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,4-Dichloro-2-butene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichlorobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichlorobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,4-Dichlorobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Dichlorodifluoromethane	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloroethane	< 0.086	0.086	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethene	< 0.086	0.086	ug/m3 Air	Nov-17-12	Nov-22-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW10-22B (2110724-12) Matrix: Air Sampled: Nov-09-12 12:50, Continued

Sampling Flow (mL/min): 232 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,2-Dichloroethene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloropropane	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl acetate	< 1.4	1.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethylbenzene	**0.43**	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl ether	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachlorobutadiene	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl methacrylate	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachloroethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Hexane	< 2.9	2.9	ug/m3 Air	Nov-17-12	Nov-22-12	
Isopropylbenzene (Cumene)	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Methacrylonitrile	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl acrylate	< 1.4	1.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl cyclohexane	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl tert-butyl ether	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
Methylene chloride	< 2.9	2.9	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl methacrylate	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
4-Methyl-2-Pentanone (MIBK)	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
Naphthalene	**0.52**	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Nitrobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Styrene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1,2-Tetrachloroethane	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2,2-Tetrachloroethane	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrachloroethene	< 1.4	1.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrahydrofuran	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1-Trichloroethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
Toluene	< 2.9	2.9	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trichlorobenzene	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2-Trichloroethane	< 0.14	0.14	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichloroethene	< 0.086	0.086	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichlorofluoromethane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,3-Trichloropropane	< 0.29	0.29	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trimethylbenzene	**1.3**	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3,5-Trimethylbenzene	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
Vinyl chloride	< 0.58	0.58	ug/m3 Air	Nov-17-12	Nov-22-12	
Xylenes (total)	**2.3**	1.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Surrogate: Toluene-d8	*100 %*	*66-122*		*Nov-17-12*	*Nov-22-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-01B-S (2110724-13) Matrix: Air Sampled: Nov-10-12 09:56

Sampling Flow (mL/min): 208 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-22-12	
nC6-nC8 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-22-12	
nC8-nC10 (aromatic)	**3.2**	3.2	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 320	320	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 320	320	ug/m3 Air	Nov-17-12	Nov-22-12	
nC12-nC16 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 320	320	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 320	320	ug/m3 Air	Nov-17-12	Nov-22-12	
VHv (6-13)	< 640	640	ug/m3 Air	Nov-17-12	Nov-22-12	
VPHv	< 640	640	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-22-12	
Acrylonitrile	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Allyl chloride	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Benzene	**1.5**	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromodichloromethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromoform	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Butanone (MEK)	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon disulfide	**0.99**	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon tetrachloride	< 0.096	0.096	ug/m3 Air	Nov-17-12	Nov-22-12	
Chlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroethane	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroform	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Chlorotoluene	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Decane	< 0.96	0.96	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromo-3-chloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromochloromethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromoethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromomethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,4-Dichloro-2-butene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,4-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Dichlorodifluoromethane	**4.8**	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloroethane	< 0.096	0.096	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethene	< 0.096	0.096	ug/m3 Air	Nov-17-12	Nov-22-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-01B-S (2110724-13) Matrix: Air Sampled: Nov-10-12 09:56, Continued

Sampling Flow (mL/min): 208 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl acetate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethylbenzene	**0.51**	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl ether	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachlorobutadiene	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl methacrylate	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Hexane	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-22-12	
Isopropylbenzene (Cumene)	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Methacrylonitrile	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl acrylate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl cyclohexane	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl tert-butyl ether	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
Methylene chloride	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl methacrylate	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
4-Methyl-2-Pentanone (MIBK)	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
Naphthalene	**1.8**	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Nitrobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Styrene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrahydrofuran	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1-Trichloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
Toluene	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichloroethene	**0.19**	0.096	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichlorofluoromethane	**0.87**	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,3-Trichloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trimethylbenzene	**0.64**	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3,5-Trimethylbenzene	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
Vinyl chloride	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-22-12	
Xylenes (total)	**2.8**	1.6	ug/m3 Air	Nov-17-12	Nov-22-12	
Surrogate: Toluene-d8	*104 %*	*66-122*		*Nov-17-12*	*Nov-22-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-01B-D (2110724-14) Matrix: Air Sampled: Nov-10-12 10:14

Sampling Flow (mL/min): 200 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC6-nC8 (aromatic)	**5.3**	3.3	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC8-nC10 (aromatic)	**3.3**	3.3	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-22-12	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 330	330	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-22-12	
VHv (6-13)	< 670	670	ug/m3 Air	Nov-17-12	Nov-22-12	
VPHv	< 670	670	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-22-12	
Acrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Allyl chloride	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Benzene	**1.6**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromodichloromethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromoform	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Butanone (MEK)	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon disulfide	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon tetrachloride	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
Chlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroethane	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroform	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Chlorotoluene	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Decane	< 1.0	1.0	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromomethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Dichlorodifluoromethane	**4.3**	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloroethane	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethene	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-01B-D (2110724-14) Matrix: Air Sampled: Nov-10-12 10:14, Continued

Sampling Flow (mL/min): 200 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloropropane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl acetate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethylbenzene	**0.87**	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl ether	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachlorobutadiene	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Hexane	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-22-12	
Isopropylbenzene (Cumene)	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl acrylate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl cyclohexane	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl tert-butyl ether	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Methylene chloride	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl methacrylate	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
4-Methyl-2-Pentanone (MIBK)	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Naphthalene	**0.43**	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Nitrobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Styrene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1,2-Tetrachloroethane	**1.2**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2,2-Tetrachloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrachloroethene	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
Toluene	**3.7**	3.3	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2-Trichloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichloroethene	**0.17**	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichlorofluoromethane	**0.97**	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trimethylbenzene	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3,5-Trimethylbenzene	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Vinyl chloride	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Xylenes (total)	**3.2**	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Surrogate: Toluene-d8	*98 %*	*66-122*		*Nov-17-12*	*Nov-22-12*	

SAMPLE DATA

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-02-S (2110724-15) Matrix: Air Sampled: Nov-10-12 11:12

Sampling Flow (mL/min): 199 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC6-nC8 (aromatic)	**10**	3.4	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC8-nC10 (aromatic)	< 3.4	3.4	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 340	340	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-22-12	
nC10-nC12 (aromatic)	< 3.4	3.4	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 340	340	ug/m3 Air	Nov-17-12	Nov-22-12	
nC12-nC16 (aromatic)	< 3.4	3.4	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 340	340	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 340	340	ug/m3 Air	Nov-17-12	Nov-22-12	
VHv (6-13)	< 670	670	ug/m3 Air	Nov-17-12	Nov-22-12	
VPHv	< 670	670	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.4	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Acrylonitrile	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Allyl chloride	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Benzene	**1.8**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromodichloromethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Bromoform	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Butanone (MEK)	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon disulfide	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Carbon tetrachloride	**0.10**	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
Chlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroethane	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Chloroform	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
2-Chlorotoluene	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Decane	< 1.0	1.0	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromo-3-chloropropane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromochloromethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dibromoethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Dibromomethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,4-Dichloro-2-butene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,4-Dichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Dichlorodifluoromethane	**5.4**	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloroethane	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1-Dichloroethene	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-02-S (2110724-15) Matrix: Air Sampled: Nov-10-12 11:12, Continued

Sampling Flow (mL/min): 199 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
trans-1,2-Dichloroethene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2-Dichloropropane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3-Dichloropropene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl acetate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethylbenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl ether	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachlorobutadiene	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Ethyl methacrylate	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Hexachloroethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
n-Hexane	< 3.4	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Isopropylbenzene (Cumene)	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Methacrylonitrile	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl acrylate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl cyclohexane	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl tert-butyl ether	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Methylene chloride	< 3.4	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
Methyl methacrylate	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
4-Methyl-2-Pentanone (MIBK)	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Naphthalene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Nitrobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Styrene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1,2-Tetrachloroethane	**0.47**	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2,2-Tetrachloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrachloroethene	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Tetrahydrofuran	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,1-Trichloroethane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
Toluene	**8.7**	3.4	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trichlorobenzene	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,1,2-Trichloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichloroethene	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-22-12	
Trichlorofluoromethane	**1.1**	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,3-Trichloropropane	< 0.34	0.34	ug/m3 Air	Nov-17-12	Nov-22-12	
1,2,4-Trimethylbenzene	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
1,3,5-Trimethylbenzene	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Vinyl chloride	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-22-12	
Xylenes (total)	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-22-12	
Surrogate: Toluene-d8	*110 %*	*66-122*		*Nov-17-12*	*Nov-22-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-02-D (2110724-16) Matrix: Air Sampled: Nov-10-12 10:52

Sampling Flow (mL/min): 200 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**200**	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**47**	3.3	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	**3.3**	3.3	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	**370**	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 330	330	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 670	670	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 670	670	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**1.7**	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	**0.13**	0.10	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 1.0	1.0	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**5.0**	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-23-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-02-D (2110724-16) Matrix: Air Sampled: Nov-10-12 10:52, Continued

Sampling Flow (mL/min): 200 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	**0.40**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	**1.9**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	**1.2**	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**47**	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.10	0.10	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**1.1**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.67	0.67	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*105 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-03B-S (2110724-17) Matrix: Air Sampled: Nov-10-12 11:44

Sampling Flow (mL/min): 204 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**330**	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**120**	33	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	**190**	160	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	**160**	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	**4.9**	3.3	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	**170**	160	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	**490**	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 330	330	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 650	650	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 650	650	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	**3.6**	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**3.9**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	**2.5**	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	< 0.098	0.098	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 2.0	2.0	ug/m3 Air	Nov-17-12	Nov-23-12	RA3
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**5.2**	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.098	0.098	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	< 0.098	0.098	ug/m3 Air	Nov-17-12	Nov-23-12	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-03B-S (2110724-17) Matrix: Air Sampled: Nov-10-12 11:44, Continued

Sampling Flow (mL/min): 204 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	**4.3**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	**1.5**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**120**	33	ug/m3 Air	Nov-17-12	Nov-24-12	RA2
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.098	0.098	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**0.52**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*101 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-03B-D (2110724-18) Matrix: Air Sampled: Nov-10-12 12:02

Sampling Flow (mL/min): 202 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**590**	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**140**	33	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	**460**	170	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	**790**	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	**40**	3.3	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	**760**	170	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	**1400**	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 330	330	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	**1700**	660	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	**1300**	660	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	**9.2**	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**7.6**	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	**0.66**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	**9.9**	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	**7.3**	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 0.99	0.99	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**5.0**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-03B-D (2110724-18) Matrix: Air Sampled: Nov-10-12 12:02, Continued

Sampling Flow (mL/min): 202 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	**2.3**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	**5.9**	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	**1.4**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	**4.0**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	**6.6**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	**1.5**	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**140**	33	ug/m3 Air	Nov-17-12	Nov-23-12	RA2
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**1.3**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	**2.7**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	**0.66**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	**25**	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*102 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-04B-S (2110724-19) Matrix: Air Sampled: Nov-09-12 15:54

Sampling Flow (mL/min): 213 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**160**	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**19**	3.1	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	< 3.1	3.1	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 310	310	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.1	3.1	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 310	310	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.1	3.1	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 310	310	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 310	310	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 630	630	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 630	630	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.1	3.1	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**1.6**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	**1.6**	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	**17**	0.094	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 1.9	1.9	ug/m3 Air	Nov-17-12	Nov-23-12	RA3
1,2-Dibromo-3-chloropropane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**6.0**	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.094	0.094	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	< 0.094	0.094	ug/m3 Air	Nov-17-12	Nov-23-12	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-04B-S (2110724-19) Matrix: Air Sampled: Nov-09-12 15:54, Continued

Sampling Flow (mL/min): 213 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	**0.34**	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.1	3.1	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.1	3.1	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**18**	3.1	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.094	0.094	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**2.3**	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.31	0.31	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	**0.85**	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	**1.7**	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*106 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-04B-DA (2110724-20) Matrix: Air Sampled: Nov-09-12 16:25

Sampling Flow (mL/min): 226 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 150	150	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**4.7**	3.0	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 150	150	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 150	150	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	< 3.0	3.0	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 150	150	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 290	290	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 150	150	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.0	3.0	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 150	150	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 290	290	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.0	3.0	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 290	290	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 290	290	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 590	590	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 590	590	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.0	3.0	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**1.2**	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	**0.86**	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	**8.0**	0.089	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	**0.15**	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 1.8	1.8	ug/m3 Air	Nov-17-12	Nov-23-12	RA3
1,2-Dibromo-3-chloropropane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**6.2**	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.089	0.089	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	**0.21**	0.089	ug/m3 Air	Nov-17-12	Nov-23-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-04B-DA (2110724-20) Matrix: Air Sampled: Nov-09-12 16:25, Continued

Sampling Flow (mL/min): 226 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.0	3.0	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	**0.80**	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.0	3.0	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	**0.30**	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	**0.53**	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.5	1.5	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**3.2**	3.0	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.15	0.15	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	**0.15**	0.089	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**1.9**	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.30	0.30	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	**1.0**	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.59	0.59	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	**1.6**	1.5	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*100 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-04B-DB (2110724-21) Matrix: Air Sampled: Nov-09-12 16:25

Sampling Flow (mL/min): 203 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**160**	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**21**	3.3	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	**4.9**	3.3	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 330	330	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 660	660	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 660	660	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**1.1**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 2.0	2.0	ug/m3 Air	Nov-17-12	Nov-23-12	RA3
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**4.6**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	**0.20**	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-04B-DB (2110724-21) Matrix: Air Sampled: Nov-09-12 16:25, Continued

Sampling Flow (mL/min): 203 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	**0.56**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**20**	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**0.99**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	**1.5**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	**3.0**	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*104 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-08-S (2110724-22) Matrix: Air Sampled: Nov-09-12 15:03

Sampling Flow (mL/min): 211 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**280**	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**92**	32	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	**200**	160	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	**160**	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	**3.2**	3.2	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	**160**	160	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	**470**	320	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 320	320	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 320	320	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 320	320	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 630	630	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 630	630	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**1.2**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	**1.7**	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	< 0.095	0.095	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 1.9	1.9	ug/m3 Air	Nov-17-12	Nov-23-12	RA3
1,2-Dibromo-3-chloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**4.7**	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.095	0.095	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	**0.25**	0.095	ug/m3 Air	Nov-17-12	Nov-23-12	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-08-S (2110724-22) Matrix: Air Sampled: Nov-09-12 15:03, Continued

Sampling Flow (mL/min): 211 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	**0.47**	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	**0.32**	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**92**	32	ug/m3 Air	Nov-17-12	Nov-24-12	RA2
1,2,4-Trichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.095	0.095	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**2.5**	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	**0.95**	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.63	0.63	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	**2.4**	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*122 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-08-D (2110724-23) Matrix: Air Sampled: Nov-09-12 15:22

Sampling Flow (mL/min): 209 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**190**	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**48**	3.2	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	**350**	320	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 320	320	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.2	3.2	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 320	320	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 320	320	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 640	640	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 640	640	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**0.93**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	**3.2**	0.096	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	**0.19**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 1.9	1.9	ug/m3 Air	Nov-17-12	Nov-23-12	RA3
1,2-Dibromo-3-chloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**4.8**	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.096	0.096	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	**0.13**	0.096	ug/m3 Air	Nov-17-12	Nov-23-12	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-08-D (2110724-23) Matrix: Air Sampled: Nov-09-12 15:22, Continued

Sampling Flow (mL/min): 209 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.2	3.2	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	**0.22**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	**0.64**	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**48**	3.2	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.096	0.096	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**2.0**	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.32	0.32	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	**0.80**	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.64	0.64	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*105 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

SAMPLE DATA

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-09-SA (2110724-24) Matrix: Air Sampled: Nov-09-12 14:07

Sampling Flow (mL/min): 204 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**160**	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**20**	3.3	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	**5.6**	3.3	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 330	330	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 650	650	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 650	650	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.49	0.49	ug/m3 Air	Nov-17-12	Nov-23-12	RA1
Allyl chloride	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**1.1**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	**0.88**	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	< 0.098	0.098	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	**2.0**	2.0	ug/m3 Air	Nov-17-12	Nov-23-12	RA3
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**4.3**	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.098	0.098	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	< 0.098	0.098	ug/m3 Air	Nov-17-12	Nov-23-12	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-09-SA (2110724-24) Matrix: Air Sampled: Nov-09-12 14:07, Continued

Sampling Flow (mL/min): 204 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	**0.65**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**19**	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.098	0.098	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**0.92**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	**1.5**	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.65	0.65	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	**3.3**	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*107 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

SAMPLE DATA

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-09-SB (2110724-25) Matrix: Air Sampled: Nov-09-12 14:07

Sampling Flow (mL/min): 201 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**5.3**	3.3	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	**200**	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	**4.0**	3.3	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	**190**	170	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	**360**	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 170	170	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 170	170	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 330	330	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 660	660	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 660	660	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**1.4**	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	**1.1**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	**16**	0.100	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	**4.3**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	**0.23**	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 2.0	2.0	ug/m3 Air	Nov-17-12	Nov-23-12	RA3
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**7.3**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.100	0.100	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	**0.100**	0.100	ug/m3 Air	Nov-17-12	Nov-23-12	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-09-SB (2110724-25) Matrix: Air Sampled: Nov-09-12 14:07, Continued

Sampling Flow (mL/min): 201 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	**0.66**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	**0.37**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	**0.46**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.7	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**4.0**	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.17	0.17	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.100	0.100	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**2.0**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	**1.6**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	**2.2**	1.7	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*104 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-09-D (2110724-26) Matrix: Air Sampled: Nov-09-12 14:29

Sampling Flow (mL/min): 203 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Aggregate Organic Parameters						
nC6-nC8 (total)	**330**	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC6-nC8 (aromatic)	**130**	33	ug/m3 Air	N/A	N/A	
nC6-nC8 (non-aromatic)	**210**	160	ug/m3 Air	N/A	N/A	
nC8-nC10 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC8-nC10 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC8-nC10 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC6-nC10 (total)	**490**	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (total)	< 160	160	ug/m3 Air	Nov-17-12	Nov-23-12	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC10-nC12 (non-aromatic)	< 160	160	ug/m3 Air	N/A	N/A	
nC12-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3 Air	N/A	N/A	
nC12-nC16 (non-aromatic)	< 330	330	ug/m3 Air	N/A	N/A	
nC10-nC16 (total)	< 330	330	ug/m3 Air	Nov-17-12	Nov-23-12	
VHv (6-13)	< 660	660	ug/m3 Air	Nov-17-12	Nov-23-12	
VPHv	< 660	660	ug/m3 Air	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Acrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Allyl chloride	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Benzene	**1.4**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromodichloromethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Bromoform	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Butanone (MEK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon disulfide	**1.4**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Carbon tetrachloride	**0.79**	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
Chlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroethane	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Chloroform	**0.16**	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
2-Chlorotoluene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Decane	< 2.0	2.0	ug/m3 Air	Nov-17-12	Nov-23-12	RA3
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dibromomethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Dichlorodifluoromethane	**4.9**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloroethane	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1-Dichloroethene	**0.20**	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

MW11-09-D (2110724-26) Matrix: Air Sampled: Nov-09-12 14:29, Continued

Sampling Flow (mL/min): 203 Sampling Time (min): 15

Analyte	Result	RDL	Units	Prepared	Analyzed	Notes
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl acetate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethylbenzene	**0.46**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachlorobutadiene	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Hexachloroethane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
n-Hexane	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Isopropylbenzene (Cumene)	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl acrylate	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl cyclohexane	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl tert-butyl ether	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Methylene chloride	< 3.3	3.3	ug/m3 Air	Nov-17-12	Nov-23-12	
Methyl methacrylate	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
4-Methyl-2-Pentanone (MIBK)	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Naphthalene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Nitrobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Styrene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2,2-Tetrachloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,1-Trichloroethane	**0.56**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
Toluene	**130**	33	ug/m3 Air	Nov-17-12	Nov-23-12	RA2
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichloroethene	< 0.099	0.099	ug/m3 Air	Nov-17-12	Nov-23-12	
Trichlorofluoromethane	**2.1**	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air	Nov-17-12	Nov-23-12	
1,2,4-Trimethylbenzene	**0.69**	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
1,3,5-Trimethylbenzene	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Vinyl chloride	< 0.66	0.66	ug/m3 Air	Nov-17-12	Nov-23-12	
Xylenes (total)	**2.4**	1.6	ug/m3 Air	Nov-17-12	Nov-23-12	
Surrogate: Toluene-d8	*108 %*	*66-122*		*Nov-17-12*	*Nov-23-12*	

SAMPLE DATA

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

Sample Qualifiers:

RA1	Reported Detection Limit (RDL) for this analyte has been raised due to matrix interference.
RA2	Reported Detection Limit (RDL) for this analyte has been raised because initial result was over the calibration range. The sample was diluted and re-analyzed.
RA3	Reported Detection Limit (RDL) for this analyte has been raised due to blank contamination.

ANALYSIS / REPORT INFORMATION

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

Analysis Description	**Method Reference(s)** (* = modified from) **Preparation**	**Analysis**	**LAB**
Vapour Hydrocarbon Fractionation	N/A	In-House	RMD
Vapour Analysis (VHv)	N/A	BCMOE	RMD
Vapour Analysis (VOC)	N/A	EPA TO-17	RMD

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

The following section reports quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with quality control samples that ensure your data is of the highest quality. Common QC types include:

- Method Blank (Blk): Laboratory reagent water is carried through sample preparation and analysis steps. Method Blanks indicate that results are free from contamination, i.e. not biased high from sources such as the sample container or the laboratory environment

- Duplicate (Dup): Preparation and analysis of a replicate aliquot of a sample. Duplicates provide a measure of the analytical method's precision, i.e. how reproducible a result is. Duplicates are only reported if they are associated with your sample data.

- Blank Spike (BS): A known amount of standard is carried through sample preparation and analysis steps. Blank Spikes, also known as laboratory control samples (LCS), are prepared from a different source of standard than used for the calibration. They ensure that the calibration is acceptable (i.e. not biased high or low) and also provide a measure of the analytical method's accuracy (i.e. closeness of the result to a target value).

- Standard Reference Material (SRM): A material of similar matrix to the samples, externally certified for the parameter(s) listed. Standard Reference Materials ensure that the preparation steps in the method are adequate to achieve acceptable recoveries of the parameter(s) tested for.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	% REC	% REC Limits	% RPD	% RPD Limit	Notes
Aggregate Organic Parameters, Batch B2K0625										
Blank (B2K0625-BLK1)				Prepared: Nov-17-12, Analyzed: Nov-22-12						
nC6-nC8 (total)	< 0.5	0.5	ug							
nC8-nC10 (total)	< 0.5	0.5	ug							
nC6-nC10 (total)	< 1.0	1.0	ug							
nC10-nC12 (total)	< 0.5	0.5	ug							
nC12-nC16 (total)	< 1.0	1.0	ug							
nC10-nC16 (total)	< 1.0	1.0	ug							
VHv (6-13)	< 2	2	ug							
Blank (B2K0625-BLK2)				Prepared: Nov-17-12, Analyzed: Nov-23-12						
nC6-nC8 (total)	< 0.5	0.5	ug							
nC8-nC10 (total)	0.6	0.5	ug							BLK
nC6-nC10 (total)	< 1.0	1.0	ug							
nC10-nC12 (total)	< 0.5	0.5	ug							
nC12-nC16 (total)	< 1.0	1.0	ug							
nC10-nC16 (total)	< 1.0	1.0	ug							
VHv (6-13)	< 2	2	ug							
LCS (B2K0625-BS3)				Prepared: Nov-17-12, Analyzed: Nov-22-12						
VHv (6-13)	10	2	ug	10.0		103	86-122			
LCS (B2K0625-BS4)				Prepared: Nov-17-12, Analyzed: Nov-23-12						
VHv (6-13)	10	2	ug	10.0		103	86-122			
Duplicate (B2K0625-DUP1)		**Source: 2110724-02**		Prepared: Nov-17-12, Analyzed: Nov-23-12						
nC6-nC8 (total)	220	160	ug/m3 Air		190				30	
nC8-nC10 (total)	160	160	ug/m3 Air		160				30	
nC6-nC10 (total)	380	320	ug/m3 Air		350				30	
nC10-nC12 (total)	190	160	ug/m3 Air		160				30	
nC12-nC16 (total)	< 316	320	ug/m3 Air		< 316				30	
nC10-nC16 (total)	350	320	ug/m3 Air		350				30	
VHv (6-13)	630	630	ug/m3 Air		630				30	
Duplicate (B2K0625-DUP2)		**Source: 2110724-17**		Prepared: Nov-17-12, Analyzed: Nov-23-12						
nC6-nC8 (total)	330	160	ug/m3 Air		330				30	
nC8-nC10 (total)	200	160	ug/m3 Air		160				30	
nC6-nC10 (total)	520	330	ug/m3 Air		490				30	
nC10-nC12 (total)	< 163	160	ug/m3 Air		< 163				30	
nC12-nC16 (total)	< 327	330	ug/m3 Air		< 327				30	
nC10-nC16 (total)	< 327	330	ug/m3 Air		< 327				30	
VHv (6-13)	650	650	ug/m3 Air		650				30	

Volatile Organic Compounds (VOC), Batch B2K0625

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	% REC	% REC Limits	% RPD	% RPD Limit	Notes

Volatile Organic Compounds (VOC), Batch B2K0625, Continued

Blank (B2K0625-BLK1) Prepared: Nov-17-12, Analyzed: Nov-22-12

Acetone	< 0.010	0.010	ug							
Acrylonitrile	< 0.0010	0.0010	ug							
Allyl chloride	< 0.0005	0.0005	ug							
Benzene	0.0020	0.0005	ug							BLK
Bromobenzene	< 0.0010	0.0010	ug							
Bromodichloromethane	< 0.0005	0.0005	ug							
Bromoform	< 0.0010	0.0010	ug							
2-Butanone (MEK)	< 0.0020	0.0020	ug							
Carbon disulfide	< 0.0020	0.0020	ug							
Carbon tetrachloride	< 0.0003	0.0003	ug							
Chlorobenzene	< 0.0010	0.0010	ug							
Chloroethane	< 0.0050	0.0050	ug							
Chloroform	< 0.0005	0.0005	ug							
2-Chlorotoluene	< 0.0020	0.0020	ug							
n-Decane	< 0.0030	0.0030	ug							RA3
1,2-Dibromo-3-chloropropane	< 0.0010	0.0010	ug							
Dibromochloromethane	< 0.0010	0.0010	ug							
1,2-Dibromoethane	< 0.0010	0.0010	ug							
Dibromomethane	< 0.0010	0.0010	ug							
trans-1,4-Dichloro-2-butene	< 0.0010	0.0010	ug							
1,2-Dichlorobenzene	< 0.0010	0.0010	ug							
1,3-Dichlorobenzene	< 0.0010	0.0010	ug							
1,4-Dichlorobenzene	< 0.0010	0.0010	ug							
Dichlorodifluoromethane	< 0.0020	0.0020	ug							
1,1-Dichloroethane	< 0.0010	0.0010	ug							
1,2-Dichloroethane	< 0.0003	0.0003	ug							
1,1-Dichloroethene	< 0.0003	0.0003	ug							
cis-1,2-Dichloroethene	< 0.0010	0.0010	ug							
trans-1,2-Dichloroethene	< 0.0010	0.0010	ug							
1,2-Dichloropropane	< 0.0005	0.0005	ug							
1,3-Dichloropropane	< 0.0010	0.0010	ug							
1,3-Dichloropropene	< 0.0010	0.0010	ug							
Ethyl acetate	< 0.0050	0.0050	ug							
Ethylbenzene	< 0.0010	0.0010	ug							
Ethyl ether	< 0.0020	0.0020	ug							
Hexachlorobutadiene	< 0.0005	0.0005	ug							
Ethyl methacrylate	< 0.0010	0.0010	ug							
Hexachloroethane	< 0.0010	0.0010	ug							
n-Hexane	< 0.010	0.010	ug							
Isopropylbenzene (Cumene)	< 0.0010	0.0010	ug							
Methacrylonitrile	< 0.0010	0.0010	ug							
Methyl acrylate	< 0.0050	0.0050	ug							
Methyl cyclohexane	< 0.0020	0.0020	ug							
Methyl tert-butyl ether	< 0.0020	0.0020	ug							
Methylene chloride	< 0.010	0.010	ug							
Methyl methacrylate	< 0.0020	0.0020	ug							
4-Methyl-2-Pentanone (MIBK)	< 0.0020	0.0020	ug							
Naphthalene	< 0.0010	0.0010	ug							
Nitrobenzene	< 0.0010	0.0010	ug							
Styrene	< 0.0010	0.0010	ug							
1,1,1,2-Tetrachloroethane	< 0.0005	0.0005	ug							
1,1,2,2-Tetrachloroethane	< 0.0005	0.0005	ug							
Tetrachloroethene	< 0.0050	0.0050	ug							
Tetrahydrofuran	< 0.0010	0.0010	ug							
1,1,1-Trichloroethane	< 0.0010	0.0010	ug							
Toluene	< 0.010	0.010	ug							
1,2,4-Trichlorobenzene	< 0.0010	0.0010	ug							
1,1,2-Trichloroethane	< 0.0005	0.0005	ug							
Trichloroethene	< 0.0003	0.0003	ug							
Trichlorofluoromethane	< 0.0010	0.0010	ug							
1,2,3-Trichloropropane	< 0.0010	0.0010	ug							
1,2,4-Trimethylbenzene	< 0.0020	0.0020	ug							
1,3,5-Trimethylbenzene	< 0.0020	0.0020	ug							
Vinyl chloride	< 0.0020	0.0020	ug							
Xylenes (total)	< 0.0050	0.0050	ug							

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	% REC	% REC Limits	% RPD	% RPD Limit	Notes

Volatile Organic Compounds (VOC), Batch B2K0625, Continued

Blank (B2K0625-BLK2) Prepared: Nov-17-12, Analyzed: Nov-23-12

Acetone	< 0.010	0.010	ug							
Acrylonitrile	< 0.0010	0.0010	ug							
Allyl chloride	< 0.0005	0.0005	ug							
Benzene	0.0058	0.0005	ug							BLK
Bromobenzene	< 0.0010	0.0010	ug							
Bromodichloromethane	< 0.0005	0.0005	ug							
Bromoform	< 0.0010	0.0010	ug							
2-Butanone (MEK)	< 0.0020	0.0020	ug							
Carbon disulfide	< 0.0020	0.0020	ug							
Carbon tetrachloride	< 0.0003	0.0003	ug							
Chlorobenzene	< 0.0010	0.0010	ug							
Chloroethane	< 0.0050	0.0050	ug							
Chloroform	< 0.0005	0.0005	ug							
2-Chlorotoluene	< 0.0020	0.0020	ug							
n-Decane	0.0050	0.0030	ug							BLK
1,2-Dibromo-3-chloropropane	< 0.0010	0.0010	ug							
Dibromochloromethane	< 0.0010	0.0010	ug							
1,2-Dibromoethane	< 0.0010	0.0010	ug							
Dibromomethane	< 0.0010	0.0010	ug							
trans-1,4-Dichloro-2-butene	< 0.0010	0.0010	ug							
1,2-Dichlorobenzene	< 0.0010	0.0010	ug							
1,3-Dichlorobenzene	< 0.0010	0.0010	ug							
1,4-Dichlorobenzene	< 0.0010	0.0010	ug							
Dichlorodifluoromethane	< 0.0020	0.0020	ug							
1,1-Dichloroethane	< 0.0010	0.0010	ug							
1,2-Dichloroethane	< 0.0003	0.0003	ug							
1,1-Dichloroethene	< 0.0003	0.0003	ug							
cis-1,2-Dichloroethene	< 0.0010	0.0010	ug							
trans-1,2-Dichloroethene	< 0.0010	0.0010	ug							
1,2-Dichloropropane	< 0.0005	0.0005	ug							
1,3-Dichloropropane	< 0.0010	0.0010	ug							
1,3-Dichloropropene	< 0.0010	0.0010	ug							
Ethyl acetate	< 0.0050	0.0050	ug							
Ethylbenzene	< 0.0010	0.0010	ug							
Ethyl ether	< 0.0020	0.0020	ug							
Hexachlorobutadiene	< 0.0005	0.0005	ug							
Ethyl methacrylate	< 0.0010	0.0010	ug							
Hexachloroethane	< 0.0010	0.0010	ug							
n-Hexane	< 0.010	0.010	ug							
Isopropylbenzene (Cumene)	< 0.0010	0.0010	ug							
Methacrylonitrile	< 0.0010	0.0010	ug							
Methyl acrylate	< 0.0050	0.0050	ug							
Methyl cyclohexane	< 0.0020	0.0020	ug							
Methyl tert-butyl ether	< 0.0020	0.0020	ug							
Methylene chloride	< 0.010	0.010	ug							
Methyl methacrylate	< 0.0020	0.0020	ug							
4-Methyl-2-Pentanone (MIBK)	< 0.0020	0.0020	ug							
Naphthalene	< 0.0010	0.0010	ug							
Nitrobenzene	< 0.0010	0.0010	ug							
Styrene	< 0.0010	0.0010	ug							
1,1,1,2-Tetrachloroethane	< 0.0005	0.0005	ug							
1,1,2,2-Tetrachloroethane	< 0.0005	0.0005	ug							
Tetrachloroethene	< 0.0050	0.0050	ug							
Tetrahydrofuran	< 0.0010	0.0010	ug							
1,1,1-Trichloroethane	< 0.0010	0.0010	ug							
Toluene	< 0.010	0.010	ug							
1,2,4-Trichlorobenzene	< 0.0010	0.0010	ug							
1,1,2-Trichloroethane	< 0.0005	0.0005	ug							
Trichloroethene	< 0.0003	0.0003	ug							
Trichlorofluoromethane	< 0.0010	0.0010	ug							
1,2,3-Trichloropropane	< 0.0010	0.0010	ug							
1,2,4-Trimethylbenzene	0.0023	0.0020	ug							BLK
1,3,5-Trimethylbenzene	< 0.0020	0.0020	ug							
Vinyl chloride	< 0.0020	0.0020	ug							
Xylenes (total)	< 0.0050	0.0050	ug							

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

Volatile Organic Compounds (VOC), Batch B2K0625, Continued

LCS (B2K0625-BS1) Prepared: Nov-17-12, Analyzed: Nov-22-12

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	% REC	% REC Limits	% RPD	% RPD Limit	Notes
Acetone	0.0598	0.010	ug	0.0500		120	70-130			
Acrylonitrile	0.0561	0.0010	ug	0.0500		112	70-130			
Allyl chloride	0.0371	0.0005	ug	0.0500		74	70-130			
Benzene	0.0336	0.0005	ug	0.0500		67	70-130			SPK
Bromobenzene	0.0706	0.0010	ug	0.0500		141	70-130			SPK
Bromodichloromethane	0.0374	0.0005	ug	0.0500		75	70-130			
Bromoform	0.0544	0.0010	ug	0.0500		109	70-130			
2-Butanone (MEK)	0.0420	0.0020	ug	0.0500		84	70-130			
Carbon disulfide	0.0386	0.0020	ug	0.0500		77	70-130			
Carbon tetrachloride	0.0472	0.0003	ug	0.0500		94	70-130			
Chlorobenzene	0.0684	0.0010	ug	0.0500		137	70-130			SPK
Chloroethane	0.0209	0.0050	ug	0.0500		42	70-130			SPK
Chloroform	0.0403	0.0005	ug	0.0500		81	70-130			
2-Chlorotoluene	0.0624	0.0020	ug	0.0500		125	70-130			
n-Decane	0.0541	0.0030	ug	0.0500		108	70-130			
1,2-Dibromo-3-chloropropane	0.0695	0.0010	ug	0.0500		139	70-130			SPK
Dibromochloromethane	0.0394	0.0010	ug	0.0500		79	70-130			
1,2-Dibromoethane	0.0497	0.0010	ug	0.0500		99	70-130			
Dibromomethane	0.0412	0.0010	ug	0.0500		82	70-130			
trans-1,4-Dichloro-2-butene	0.0751	0.0010	ug	0.0500		150	70-130			SPK
1,2-Dichlorobenzene	0.0644	0.0010	ug	0.0500		129	70-130			
1,3-Dichlorobenzene	0.0646	0.0010	ug	0.0500		129	70-130			
1,4-Dichlorobenzene	0.0636	0.0010	ug	0.0500		127	70-130			
Dichlorodifluoromethane	0.0080	0.0020	ug	0.0500		16	70-130			SPK
1,1-Dichloroethane	0.0343	0.0010	ug	0.0500		69	70-130			SPK
1,2-Dichloroethane	0.0370	0.0003	ug	0.0500		74	70-130			
1,1-Dichloroethene	0.0344	0.0003	ug	0.0500		69	70-130			SPK
cis-1,2-Dichloroethene	0.0444	0.0010	ug	0.0500		89	70-130			
trans-1,2-Dichloroethene	0.0432	0.0010	ug	0.0500		86	70-130			
1,2-Dichloropropane	0.0360	0.0005	ug	0.0500		72	70-130			
1,3-Dichloropropane	0.0392	0.0010	ug	0.0500		78	70-130			
1,3-Dichloropropene	0.0739	0.0010	ug	0.100		74	70-130			
Ethyl acetate	0.0305	0.0050	ug	0.0500		61	70-130			SPK
Ethylbenzene	0.0678	0.0010	ug	0.0500		136	70-130			SPK
Ethyl ether	0.0398	0.0020	ug	0.0500		80	70-130			
Hexachlorobutadiene	0.0650	0.0005	ug	0.0500		130	70-130			SPK
Ethyl methacrylate	0.0664	0.0010	ug	0.0500		133	70-130			SPK
Hexachloroethane	0.0759	0.0010	ug	0.0500		152	70-130			SPK
n-Hexane	0.0418	0.010	ug	0.0500		84	70-130			
Isopropylbenzene (Cumene)	0.0660	0.0010	ug	0.0500		132	70-130			SPK
Methacrylonitrile	0.0426	0.0010	ug	0.0500		85	70-130			
Methyl acrylate	0.0386	0.0050	ug	0.0500		77	70-130			
Methyl cyclohexane	0.0564	0.0020	ug	0.0500		113	70-130			
Methyl tert-butyl ether	0.0405	0.0020	ug	0.0500		81	70-130			
Methylene chloride	0.0441	0.010	ug	0.0500		88	70-130			
Methyl methacrylate	0.0517	0.0020	ug	0.0500		103	70-130			
4-Methyl-2-Pentanone (MIBK)	0.0595	0.0020	ug	0.0500		119	70-130			
Naphthalene	0.0482	0.0010	ug	0.0500		96	70-130			
Nitrobenzene	0.0472	0.0010	ug	0.0500		94	70-130			
Styrene	0.0620	0.0010	ug	0.0500		124	70-130			
1,1,1,2-Tetrachloroethane	0.0617	0.0005	ug	0.0500		123	70-130			
1,1,2,2-Tetrachloroethane	0.0631	0.0005	ug	0.0500		126	70-130			
Tetrachloroethene	0.0610	0.0050	ug	0.0500		122	70-130			
Tetrahydrofuran	0.0450	0.0010	ug	0.0500		90	70-130			
1,1,1-Trichloroethane	0.0382	0.0010	ug	0.0500		76	70-130			
Toluene	0.0706	0.010	ug	0.0500		141	70-130			SPK
1,2,4-Trichlorobenzene	0.0566	0.0010	ug	0.0500		113	70-130			
1,1,2-Trichloroethane	0.0399	0.0005	ug	0.0500		80	70-130			
Trichloroethene	0.0372	0.0003	ug	0.0500		74	70-130			
Trichlorofluoromethane	0.0291	0.0010	ug	0.0500		58	70-130			SPK
1,2,3-Trichloropropane	0.0672	0.0010	ug	0.0500		134	70-130			SPK
1,2,4-Trimethylbenzene	0.0612	0.0020	ug	0.0500		122	70-130			
1,3,5-Trimethylbenzene	0.0626	0.0020	ug	0.0500		125	70-130			
Vinyl chloride	0.0193	0.0020	ug	0.0500		39	70-130			SPK
Xylenes (total)	0.191	0.0050	ug	0.150		127	70-130			

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

Volatile Organic Compounds (VOC), Batch B2K0625, Continued

LCS (B2K0625-BS2) Prepared: Nov-17-12, Analyzed: Nov-23-12

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	% REC	% REC Limits	% RPD	% RPD Limit	Notes
Acetone	0.0606	0.010	ug	0.0500		121	70-130			
Acrylonitrile	0.0511	0.0010	ug	0.0500		102	70-130			
Allyl chloride	0.0286	0.0005	ug	0.0500		57	70-130			SPK
Benzene	0.0341	0.0005	ug	0.0500		68	70-130			SPK
Bromobenzene	0.0693	0.0010	ug	0.0500		139	70-130			SPK
Bromodichloromethane	0.0377	0.0005	ug	0.0500		75	70-130			
Bromoform	0.0573	0.0010	ug	0.0500		115	70-130			
2-Butanone (MEK)	0.0371	0.0020	ug	0.0500		74	70-130			
Carbon disulfide	0.0337	0.0020	ug	0.0500		67	70-130			SPK
Carbon tetrachloride	0.0440	0.0003	ug	0.0500		88	70-130			
Chlorobenzene	0.0670	0.0010	ug	0.0500		134	70-130			SPK
Chloroethane	0.0168	0.0050	ug	0.0500		34	70-130			SPK
Chloroform	0.0363	0.0005	ug	0.0500		73	70-130			
2-Chlorotoluene	0.0608	0.0020	ug	0.0500		122	70-130			
n-Decane	0.0504	0.0030	ug	0.0500		101	70-130			
1,2-Dibromo-3-chloropropane	0.0668	0.0010	ug	0.0500		134	70-130			SPK
Dibromochloromethane	0.0428	0.0010	ug	0.0500		86	70-130			
1,2-Dibromoethane	0.0510	0.0010	ug	0.0500		102	70-130			
Dibromomethane	0.0384	0.0010	ug	0.0500		77	70-130			
trans-1,4-Dichloro-2-butene	0.0613	0.0010	ug	0.0500		123	70-130			
1,2-Dichlorobenzene	0.0623	0.0010	ug	0.0500		125	70-130			
1,3-Dichlorobenzene	0.0628	0.0010	ug	0.0500		126	70-130			
1,4-Dichlorobenzene	0.0620	0.0010	ug	0.0500		124	70-130			
Dichlorodifluoromethane	0.0066	0.0020	ug	0.0500		13	70-130			SPK
1,1-Dichloroethane	0.0276	0.0010	ug	0.0500		55	70-130			SPK
1,2-Dichloroethane	0.0337	0.0003	ug	0.0500		67	70-130			SPK
1,1-Dichloroethene	0.0312	0.0003	ug	0.0500		62	70-130			SPK
cis-1,2-Dichloroethene	0.0398	0.0010	ug	0.0500		80	70-130			
trans-1,2-Dichloroethene	0.0392	0.0010	ug	0.0500		78	70-130			
1,2-Dichloropropane	0.0371	0.0005	ug	0.0500		74	70-130			
1,3-Dichloropropane	0.0401	0.0010	ug	0.0500		80	70-130			
1,3-Dichloropropene	0.0676	0.0010	ug	0.100		68	70-130			SPK
Ethyl acetate	0.0268	0.0050	ug	0.0500		54	70-130			SPK
Ethylbenzene	0.0657	0.0010	ug	0.0500		131	70-130			SPK
Ethyl ether	0.0350	0.0020	ug	0.0500		70	70-130			SPK
Hexachlorobutadiene	0.0628	0.0005	ug	0.0500		126	70-130			
Ethyl methacrylate	0.0634	0.0010	ug	0.0500		127	70-130			
Hexachloroethane	0.0721	0.0010	ug	0.0500		144	70-130			SPK
n-Hexane	0.0387	0.010	ug	0.0500		77	70-130			
Isopropylbenzene (Cumene)	0.0646	0.0010	ug	0.0500		129	70-130			
Methacrylonitrile	0.0393	0.0010	ug	0.0500		79	70-130			
Methyl acrylate	0.0367	0.0050	ug	0.0500		73	70-130			
Methyl cyclohexane	0.0537	0.0020	ug	0.0500		107	70-130			
Methyl tert-butyl ether	0.0326	0.0020	ug	0.0500		65	70-130			SPK
Methylene chloride	0.0390	0.010	ug	0.0500		78	70-130			
Methyl methacrylate	0.0491	0.0020	ug	0.0500		98	70-130			
4-Methyl-2-Pentanone (MIBK)	0.0558	0.0020	ug	0.0500		112	70-130			
Naphthalene	0.0448	0.0010	ug	0.0500		90	70-130			
Nitrobenzene	0.0654	0.0010	ug	0.0500		131	70-130			SPK
Styrene	0.0599	0.0010	ug	0.0500		120	70-130			
1,1,1,2-Tetrachloroethane	0.0631	0.0005	ug	0.0500		126	70-130			
1,1,2,2-Tetrachloroethane	0.0602	0.0005	ug	0.0500		120	70-130			
Tetrachloroethene	0.0625	0.0050	ug	0.0500		125	70-130			
Tetrahydrofuran	0.0403	0.0010	ug	0.0500		81	70-130			
1,1,1-Trichloroethane	0.0357	0.0010	ug	0.0500		71	70-130			
Toluene	0.0678	0.010	ug	0.0500		136	70-130			SPK
1,2,4-Trichlorobenzene	0.0528	0.0010	ug	0.0500		106	70-130			
1,1,2-Trichloroethane	0.0408	0.0005	ug	0.0500		82	70-130			
Trichloroethene	0.0393	0.0003	ug	0.0500		79	70-130			
Trichlorofluoromethane	0.0231	0.0010	ug	0.0500		46	70-130			SPK
1,2,3-Trichloropropane	0.0651	0.0010	ug	0.0500		130	70-130			SPK
1,2,4-Trimethylbenzene	0.0570	0.0020	ug	0.0500		114	70-130			
1,3,5-Trimethylbenzene	0.0589	0.0020	ug	0.0500		118	70-130			
Vinyl chloride	0.0176	0.0020	ug	0.0500		35	70-130			SPK
Xylenes (total)	0.185	0.0050	ug	0.150		123	70-130			

CARO ANALYTICAL SERVICES

CLIENT Golder Associates Ltd. (Calgary) **WORK ORDER #** 2110724
PROJECT 11-1324-0164 **REPORTED** Nov-30-12

Volatile Organic Compounds (VOC), Batch B2K0625, Continued

LCS Dup (B2K0625-BSD1) Prepared: Nov-17-12, Analyzed: Nov-23-12

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	% REC	% REC Limits	% RPD	% RPD Limit	Notes
Acetone	0.0649	0.010	ug	0.0500		130	70-130	8	40	
Acrylonitrile	0.0535	0.0010	ug	0.0500		107	70-130	5	30	
Allyl chloride	0.0369	0.0005	ug	0.0500		74	70-130	< 1	30	
Benzene	0.0425	0.0005	ug	0.0500		85	70-130	23	30	
Bromobenzene	0.0697	0.0010	ug	0.0500		139	70-130	1	30	SPK
Bromodichloromethane	0.0402	0.0005	ug	0.0500		80	70-130	7	30	
Bromoform	0.0516	0.0010	ug	0.0500		103	70-130	5	30	
2-Butanone (MEK)	0.0455	0.0020	ug	0.0500		91	70-130	8	30	
Carbon disulfide	0.0398	0.0020	ug	0.0500		80	70-130	3	30	
Carbon tetrachloride	0.0419	0.0003	ug	0.0500		84	70-130	12	30	
Chlorobenzene	0.0650	0.0010	ug	0.0500		130	70-130	5	30	
Chloroethane	0.0268	0.0050	ug	0.0500		54	70-130	25	30	SPK
Chloroform	0.0439	0.0005	ug	0.0500		88	70-130	9	30	
2-Chlorotoluene	0.0626	0.0020	ug	0.0500		125	70-130	< 1	30	
n-Decane	0.0550	0.0030	ug	0.0500		110	70-130	2	30	
1,2-Dibromo-3-chloropropane	0.0670	0.0010	ug	0.0500		134	70-130	4	30	SPK
Dibromochloromethane	0.0392	0.0010	ug	0.0500		78	70-130	< 1	30	
1,2-Dibromoethane	0.0461	0.0010	ug	0.0500		92	70-130	8	30	
Dibromomethane	0.0441	0.0010	ug	0.0500		88	70-130	7	30	
trans-1,4-Dichloro-2-butene	0.0644	0.0010	ug	0.0500		129	70-130	15	30	
1,2-Dichlorobenzene	0.0644	0.0010	ug	0.0500		129	70-130	< 1	30	
1,3-Dichlorobenzene	0.0647	0.0010	ug	0.0500		129	70-130	< 1	30	
1,4-Dichlorobenzene	0.0642	0.0010	ug	0.0500		128	70-130	< 1	30	
Dichlorodifluoromethane	0.0123	0.0020	ug	0.0500		25	70-130	42	30	RPD, SPK
1,1-Dichloroethane	0.0367	0.0010	ug	0.0500		73	70-130	7	30	
1,2-Dichloroethane	0.0412	0.0003	ug	0.0500		82	70-130	11	30	
1,1-Dichloroethene	0.0372	0.0003	ug	0.0500		74	70-130	8	30	
cis-1,2-Dichloroethene	0.0472	0.0010	ug	0.0500		94	70-130	6	30	
trans-1,2-Dichloroethene	0.0456	0.0010	ug	0.0500		91	70-130	5	30	
1,2-Dichloropropane	0.0424	0.0005	ug	0.0500		85	70-130	16	30	
1,3-Dichloropropane	0.0418	0.0010	ug	0.0500		84	70-130	6	30	
1,3-Dichloropropene	0.0701	0.0010	ug	0.100		70	70-130	5	30	
Ethyl acetate	0.0345	0.0050	ug	0.0500		69	70-130	12	30	SPK
Ethylbenzene	0.0661	0.0010	ug	0.0500		132	70-130	3	30	SPK
Ethyl ether	0.0431	0.0020	ug	0.0500		86	70-130	8	30	
Hexachlorobutadiene	0.0638	0.0005	ug	0.0500		128	70-130	2	30	
Ethyl methacrylate	0.0617	0.0010	ug	0.0500		123	70-130	7	30	
Hexachloroethane	0.0671	0.0010	ug	0.0500		134	70-130	12	30	SPK
n-Hexane	0.0422	0.010	ug	0.0500		84	70-130	1	30	
Isopropylbenzene (Cumene)	0.0660	0.0010	ug	0.0500		132	70-130	< 1	30	SPK
Methacrylonitrile	0.0462	0.0010	ug	0.0500		92	70-130	8	30	
Methyl acrylate	0.0440	0.0050	ug	0.0500		88	70-130	13	30	
Methyl cyclohexane	0.0530	0.0020	ug	0.0500		106	70-130	6	30	
Methyl tert-butyl ether	0.0458	0.0020	ug	0.0500		92	70-130	12	30	
Methylene chloride	0.0480	0.010	ug	0.0500		96	70-130	8	30	
Methyl methacrylate	0.0492	0.0020	ug	0.0500		98	70-130	5	30	
4-Methyl-2-Pentanone (MIBK)	0.0542	0.0020	ug	0.0500		108	70-130	9	30	
Naphthalene	0.0501	0.0010	ug	0.0500		100	70-130	4	30	
Nitrobenzene	0.0633	0.0010	ug	0.0500		127	70-130	29	30	
Styrene	0.0613	0.0010	ug	0.0500		123	70-130	1	30	
1,1,1,2-Tetrachloroethane	0.0637	0.0005	ug	0.0500		127	70-130	3	30	
1,1,2,2-Tetrachloroethane	0.0580	0.0005	ug	0.0500		116	70-130	9	30	
Tetrachloroethene	0.0622	0.0050	ug	0.0500		124	70-130	2	30	
Tetrahydrofuran	0.0474	0.0010	ug	0.0500		95	70-130	5	30	
1,1,1-Trichloroethane	0.0422	0.0010	ug	0.0500		84	70-130	10	30	
Toluene	0.0687	0.010	ug	0.0500		137	70-130	3	30	SPK
1,2,4-Trichlorobenzene	0.0588	0.0010	ug	0.0500		118	70-130	4	30	
1,1,2-Trichloroethane	0.0443	0.0005	ug	0.0500		89	70-130	10	30	
Trichloroethene	0.0449	0.0003	ug	0.0500		90	70-130	19	30	
Trichlorofluoromethane	0.0325	0.0010	ug	0.0500		65	70-130	11	30	SPK
1,2,3-Trichloropropane	0.0624	0.0010	ug	0.0500		125	70-130	7	30	
1,2,4-Trimethylbenzene	0.0622	0.0020	ug	0.0500		124	70-130	1	30	
1,3,5-Trimethylbenzene	0.0629	0.0020	ug	0.0500		126	70-130	< 1	30	
Vinyl chloride	0.0286	0.0020	ug	0.0500		57	70-130	39	40	SPK
Xylenes (total)	0.190	0.0050	ug	0.150		127	70-130	< 1	30	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

Volatile Organic Compounds (VOC), Batch B2K0625, Continued

LCS Dup (B2K0625-BSD2) Prepared: Nov-17-12, Analyzed: Nov-23-12

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	% REC	% REC Limits	% RPD	% RPD Limit	Notes
Acetone	0.0712	0.010	ug	0.0500		142	70-130	16	40	SPK
Acrylonitrile	0.0543	0.0010	ug	0.0500		109	70-130	6	30	
Allyl chloride	0.0308	0.0005	ug	0.0500		62	70-130	7	30	SPK
Benzene	0.0380	0.0005	ug	0.0500		76	70-130	11	30	
Bromobenzene	0.0702	0.0010	ug	0.0500		140	70-130	1	30	SPK
Bromodichloromethane	0.0349	0.0005	ug	0.0500		70	70-130	8	30	SPK
Bromoform	0.0513	0.0010	ug	0.0500		103	70-130	11	30	
2-Butanone (MEK)	0.0390	0.0020	ug	0.0500		78	70-130	5	30	
Carbon disulfide	0.0387	0.0020	ug	0.0500		77	70-130	14	30	
Carbon tetrachloride	0.0220	0.0003	ug	0.0500		44	70-130	66	30	SPK, RPD
Chlorobenzene	0.0655	0.0010	ug	0.0500		131	70-130	2	30	SPK
Chloroethane	0.0223	0.0050	ug	0.0500		45	70-130	28	30	SPK
Chloroform	0.0409	0.0005	ug	0.0500		82	70-130	12	30	
2-Chlorotoluene	0.0617	0.0020	ug	0.0500		123	70-130	1	30	
n-Decane	0.0538	0.0030	ug	0.0500		108	70-130	6	30	
1,2-Dibromo-3-chloropropane	0.0638	0.0010	ug	0.0500		128	70-130	5	30	
Dibromochloromethane	0.0362	0.0010	ug	0.0500		72	70-130	17	30	
1,2-Dibromoethane	0.0443	0.0010	ug	0.0500		89	70-130	14	30	
Dibromomethane	0.0423	0.0010	ug	0.0500		85	70-130	10	30	
trans-1,4-Dichloro-2-butene	0.0430	0.0010	ug	0.0500		86	70-130	35	30	RPD
1,2-Dichlorobenzene	0.0633	0.0010	ug	0.0500		127	70-130	2	30	
1,3-Dichlorobenzene	0.0637	0.0010	ug	0.0500		127	70-130	2	30	
1,4-Dichlorobenzene	0.0634	0.0010	ug	0.0500		127	70-130	2	30	
Dichlorodifluoromethane	0.0103	0.0020	ug	0.0500		21	70-130	44	30	RPD, SPK
1,1-Dichloroethane	0.0325	0.0010	ug	0.0500		65	70-130	16	30	SPK
1,2-Dichloroethane	0.0383	0.0003	ug	0.0500		77	70-130	13	30	
1,1-Dichloroethene	0.0396	0.0003	ug	0.0500		79	70-130	24	30	
cis-1,2-Dichloroethene	0.0451	0.0010	ug	0.0500		90	70-130	12	30	
trans-1,2-Dichloroethene	0.0437	0.0010	ug	0.0500		87	70-130	11	30	
1,2-Dichloropropane	0.0373	0.0005	ug	0.0500		75	70-130	< 1	30	
1,3-Dichloropropane	0.0384	0.0010	ug	0.0500		77	70-130	4	30	
1,3-Dichloropropene	0.0537	0.0010	ug	0.100		54	70-130	23	30	SPK
Ethyl acetate	0.0277	0.0050	ug	0.0500		55	70-130	3	30	SPK
Ethylbenzene	0.0659	0.0010	ug	0.0500		132	70-130	< 1	30	SPK
Ethyl ether	0.0401	0.0020	ug	0.0500		80	70-130	14	30	
Hexachlorobutadiene	0.0625	0.0005	ug	0.0500		125	70-130	< 1	30	
Ethyl methacrylate	0.0599	0.0010	ug	0.0500		120	70-130	6	30	
Hexachloroethane	0.0390	0.0010	ug	0.0500		78	70-130	59	30	RPD
n-Hexane	0.0390	0.010	ug	0.0500		78	70-130	< 1	30	
Isopropylbenzene (Cumene)	0.0658	0.0010	ug	0.0500		132	70-130	2	30	SPK
Methacrylonitrile	0.0436	0.0010	ug	0.0500		87	70-130	10	30	
Methyl acrylate	0.0387	0.0050	ug	0.0500		77	70-130	5	30	
Methyl cyclohexane	0.0510	0.0020	ug	0.0500		102	70-130	5	30	
Methyl tert-butyl ether	0.0292	0.0020	ug	0.0500		58	70-130	11	30	SPK
Methylene chloride	0.0464	0.010	ug	0.0500		93	70-130	17	30	
Methyl methacrylate	0.0468	0.0020	ug	0.0500		94	70-130	5	30	
4-Methyl-2-Pentanone (MIBK)	0.0516	0.0020	ug	0.0500		103	70-130	8	30	
Naphthalene	0.0492	0.0010	ug	0.0500		98	70-130	9	30	
Nitrobenzene	0.0735	0.0010	ug	0.0500		147	70-130	12	30	SPK
Styrene	0.0601	0.0010	ug	0.0500		120	70-130	< 1	30	
1,1,1,2-Tetrachloroethane	0.0762	0.0005	ug	0.0500		152	70-130	19	30	SPK
1,1,2,2-Tetrachloroethane	0.0555	0.0005	ug	0.0500		111	70-130	8	30	
Tetrachloroethene	0.0756	0.0050	ug	0.0500		151	70-130	19	30	SPK
Tetrahydrofuran	0.0454	0.0010	ug	0.0500		91	70-130	12	30	
1,1,1-Trichloroethane	0.0341	0.0010	ug	0.0500		68	70-130	5	30	SPK
Toluene	0.0674	0.010	ug	0.0500		135	70-130	< 1	30	SPK
1,2,4-Trichlorobenzene	0.0574	0.0010	ug	0.0500		115	70-130	8	30	
1,1,2-Trichloroethane	0.0409	0.0005	ug	0.0500		82	70-130	< 1	30	
Trichloroethene	0.0435	0.0003	ug	0.0500		87	70-130	10	30	
Trichlorofluoromethane	0.0291	0.0010	ug	0.0500		58	70-130	23	30	SPK
1,2,3-Trichloropropane	0.0611	0.0010	ug	0.0500		122	70-130	6	30	
1,2,4-Trimethylbenzene	0.0605	0.0020	ug	0.0500		121	70-130	6	30	
1,3,5-Trimethylbenzene	0.0616	0.0020	ug	0.0500		123	70-130	5	30	
Vinyl chloride	0.0267	0.0020	ug	0.0500		53	70-130	41	40	RPD, SPK
Xylenes (total)	0.186	0.0050	ug	0.150		124	70-130	< 1	30	

CARO ANALYTICAL SERVICES

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

Volatile Organic Compounds (VOC), Batch B2K0625, Continued

Duplicate (B2K0625-DUP1) **Source: 2110724-02** Prepared: Nov-17-12, Analyzed: Nov-23-12

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	% REC	% REC Limits	% RPD	% RPD Limit	Notes
Acetone	< 3.2	3.2	ug/m3 Air		< 3.2				40	
Acrylonitrile	< 0.32	0.32	ug/m3 Air		< 0.32				30	
Allyl chloride	< 0.16	0.16	ug/m3 Air		< 0.16				30	
Benzene	2.7	0.16	ug/m3 Air		1.3			71	30	RPD
Bromobenzene	< 0.32	0.32	ug/m3 Air		< 0.32				30	
Bromodichloromethane	0.57	0.16	ug/m3 Air		0.60				30	
Bromoform	< 0.32	0.32	ug/m3 Air		< 0.32				30	
2-Butanone (MEK)	< 0.63	0.63	ug/m3 Air		< 0.63				30	
Carbon disulfide	< 0.63	0.63	ug/m3 Air		< 0.63				30	
Carbon tetrachloride	< 0.095	0.095	ug/m3 Air		0.095				30	
Chlorobenzene	0.38	0.32	ug/m3 Air		< 0.32				30	
Chloroethane	< 1.6	1.6	ug/m3 Air		< 1.6				30	
Chloroform	82	0.16	ug/m3 Air		79			6	30	
2-Chlorotoluene	< 0.63	0.63	ug/m3 Air		< 0.63				30	
n-Decane	< 0.95	0.95	ug/m3 Air		< 0.95				30	
1,2-Dibromo-3-chloropropane	< 0.32	0.32	ug/m3 Air		< 0.32				30	
Dibromochloromethane	< 0.32	0.32	ug/m3 Air		< 0.32				30	
1,2-Dibromoethane	< 0.32	0.32	ug/m3 Air		< 0.32				30	
Dibromomethane	< 0.32	0.32	ug/m3 Air		< 0.32				30	
trans-1,4-Dichloro-2-butene	< 0.32	0.32	ug/m3 Air		< 0.32				30	
1,2-Dichlorobenzene	< 0.32	0.32	ug/m3 Air		< 0.32				30	
1,3-Dichlorobenzene	< 0.32	0.32	ug/m3 Air		< 0.32				30	
1,4-Dichlorobenzene	< 0.32	0.32	ug/m3 Air		< 0.32				30	
Dichlorodifluoromethane	4.1	0.63	ug/m3 Air		3.8			6	30	
1,1-Dichloroethane	< 0.32	0.32	ug/m3 Air		< 0.32				30	
1,2-Dichloroethane	< 0.095	0.095	ug/m3 Air		< 0.095				30	
1,1-Dichloroethene	0.16	0.095	ug/m3 Air		0.13				30	
cis-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air		< 0.32				30	
trans-1,2-Dichloroethene	< 0.32	0.32	ug/m3 Air		< 0.32				30	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air		< 0.16				30	
1,3-Dichloropropane	< 0.32	0.32	ug/m3 Air		< 0.32				30	
1,3-Dichloropropene	< 0.32	0.32	ug/m3 Air		< 0.32				30	
Ethyl acetate	< 1.6	1.6	ug/m3 Air		< 1.6				30	
Ethylbenzene	0.60	0.32	ug/m3 Air		0.47				30	
Ethyl ether	< 0.63	0.63	ug/m3 Air		< 0.63				30	
Hexachlorobutadiene	0.19	0.16	ug/m3 Air		< 0.16				30	
Ethyl methacrylate	< 0.32	0.32	ug/m3 Air		< 0.32				30	
Hexachloroethane	< 0.32	0.32	ug/m3 Air		< 0.32				30	
n-Hexane	< 3.2	3.2	ug/m3 Air		< 3.2				30	
Isopropylbenzene (Cumene)	< 0.32	0.32	ug/m3 Air		< 0.32				30	
Methacrylonitrile	< 0.32	0.32	ug/m3 Air		< 0.32				30	
Methyl acrylate	< 1.6	1.6	ug/m3 Air		< 1.6				30	
Methyl cyclohexane	< 0.63	0.63	ug/m3 Air		< 0.63				30	
Methyl tert-butyl ether	< 0.63	0.63	ug/m3 Air		< 0.63				30	
Methylene chloride	< 3.2	3.2	ug/m3 Air		< 3.2				30	
Methyl methacrylate	< 0.63	0.63	ug/m3 Air		< 0.63				30	
4-Methyl-2-Pentanone (MIBK)	< 0.63	0.63	ug/m3 Air		< 0.63				30	
Naphthalene	21	0.32	ug/m3 Air		20			6	30	
Nitrobenzene	< 0.32	0.32	ug/m3 Air		< 0.32				30	
Styrene	< 0.32	0.32	ug/m3 Air		< 0.32				30	
1,1,1,2-Tetrachloroethane	0.60	0.16	ug/m3 Air		0.47				30	
1,1,2,2-Tetrachloroethane	0.25	0.16	ug/m3 Air		< 0.16				30	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air		< 1.6				30	
Tetrahydrofuran	0.35	0.32	ug/m3 Air		< 0.32				30	
1,1,1-Trichloroethane	< 0.32	0.32	ug/m3 Air		< 0.32				30	
Toluene	5.1	3.2	ug/m3 Air		4.7				30	
1,2,4-Trichlorobenzene	< 0.32	0.32	ug/m3 Air		< 0.32				30	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air		< 0.16				30	
Trichloroethene	0.19	0.095	ug/m3 Air		0.095				30	
Trichlorofluoromethane	1.0	0.32	ug/m3 Air		0.92				30	
1,2,3-Trichloropropane	< 0.32	0.32	ug/m3 Air		< 0.32				30	
1,2,4-Trimethylbenzene	2.0	0.63	ug/m3 Air		1.9				30	
1,3,5-Trimethylbenzene	0.85	0.63	ug/m3 Air		0.76				30	
Vinyl chloride	< 0.63	0.63	ug/m3 Air		< 0.63				40	
Xylenes (total)	3.5	1.6	ug/m3 Air		2.7				30	

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

Volatile Organic Compounds (VOC), Batch B2K0625, Continued

Duplicate (B2K0625-DUP2) **Source: 2110724-17** Prepared: Nov-17-12, Analyzed: Nov-23-12

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	% REC	% REC Limits	% RPD	% RPD Limit	Notes
Acetone	4.6	3.3	ug/m3 Air		3.6				40	
Acrylonitrile	< 0.33	0.33	ug/m3 Air		< 0.33				30	
Allyl chloride	< 0.16	0.16	ug/m3 Air		< 0.16				30	
Benzene	4.9	0.16	ug/m3 Air		3.9			26	30	
Bromobenzene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
Bromodichloromethane	< 0.16	0.16	ug/m3 Air		< 0.16				30	
Bromoform	< 0.33	0.33	ug/m3 Air		< 0.33				30	
2-Butanone (MEK)	< 0.65	0.65	ug/m3 Air		< 0.65				30	
Carbon disulfide	2.5	0.65	ug/m3 Air		2.5				30	
Carbon tetrachloride	< 0.098	0.098	ug/m3 Air		< 0.098				30	
Chlorobenzene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
Chloroethane	< 1.6	1.6	ug/m3 Air		< 1.6				30	
Chloroform	< 0.16	0.16	ug/m3 Air		< 0.16				30	
2-Chlorotoluene	< 0.65	0.65	ug/m3 Air		< 0.65				30	
n-Decane	1.4	0.98	ug/m3 Air		1.3				30	
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3 Air		< 0.33				30	
Dibromochloromethane	< 0.33	0.33	ug/m3 Air		< 0.33				30	
1,2-Dibromoethane	< 0.33	0.33	ug/m3 Air		< 0.33				30	
Dibromomethane	< 0.33	0.33	ug/m3 Air		< 0.33				30	
trans-1,4-Dichloro-2-butene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
Dichlorodifluoromethane	5.2	0.65	ug/m3 Air		5.2			2	30	
1,1-Dichloroethane	< 0.33	0.33	ug/m3 Air		< 0.33				30	
1,2-Dichloroethane	< 0.098	0.098	ug/m3 Air		< 0.098				30	
1,1-Dichloroethene	< 0.098	0.098	ug/m3 Air		< 0.098				30	
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
1,2-Dichloropropane	< 0.16	0.16	ug/m3 Air		< 0.16				30	
1,3-Dichloropropane	< 0.33	0.33	ug/m3 Air		< 0.33				30	
1,3-Dichloropropene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
Ethyl acetate	< 1.6	1.6	ug/m3 Air		< 1.6				30	
Ethylbenzene	0.36	0.33	ug/m3 Air		< 0.33				30	
Ethyl ether	< 0.65	0.65	ug/m3 Air		< 0.65				30	
Hexachlorobutadiene	0.33	0.16	ug/m3 Air		< 0.16				30	
Ethyl methacrylate	< 0.33	0.33	ug/m3 Air		< 0.33				30	
Hexachloroethane	< 0.33	0.33	ug/m3 Air		< 0.33				30	
n-Hexane	< 3.3	3.3	ug/m3 Air		< 3.3				30	
Isopropylbenzene (Cumene)	4.2	0.33	ug/m3 Air		4.2			3	30	
Methacrylonitrile	< 0.33	0.33	ug/m3 Air		< 0.33				30	
Methyl acrylate	< 1.6	1.6	ug/m3 Air		< 1.6				30	
Methyl cyclohexane	< 0.65	0.65	ug/m3 Air		< 0.65				30	
Methyl tert-butyl ether	< 0.65	0.65	ug/m3 Air		< 0.65				30	
Methylene chloride	< 3.3	3.3	ug/m3 Air		< 3.3				30	
Methyl methacrylate	< 0.65	0.65	ug/m3 Air		< 0.65				30	
4-Methyl-2-Pentanone (MIBK)	< 0.65	0.65	ug/m3 Air		< 0.65				30	
Naphthalene	0.49	0.33	ug/m3 Air		< 0.33				30	
Nitrobenzene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
Styrene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
1,1,1,2-Tetrachloroethane	1.5	0.16	ug/m3 Air		1.5			6	30	
1,1,2,2-Tetrachloroethane	0.26	0.16	ug/m3 Air		< 0.16				30	
Tetrachloroethene	< 1.6	1.6	ug/m3 Air		< 1.6				30	
Tetrahydrofuran	< 0.33	0.33	ug/m3 Air		< 0.33				30	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3 Air		< 0.33				30	
Toluene	130	3.3	ug/m3 Air		120			10	30	RA4
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3 Air		< 0.33				30	
1,1,2-Trichloroethane	< 0.16	0.16	ug/m3 Air		< 0.16				30	
Trichloroethene	0.13	0.098	ug/m3 Air		< 0.098				30	
Trichlorofluoromethane	0.49	0.33	ug/m3 Air		0.52				30	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3 Air		< 0.33				30	
1,2,4-Trimethylbenzene	< 0.65	0.65	ug/m3 Air		< 0.65				30	
1,3,5-Trimethylbenzene	< 0.65	0.65	ug/m3 Air		< 0.65				30	
Vinyl chloride	< 0.65	0.65	ug/m3 Air		< 0.65				40	
Xylenes (total)	< 1.6	1.6	ug/m3 Air		< 1.6				30	

QUALITY CONTROL DATA

CLIENT	Golder Associates Ltd. (Calgary)	**WORK ORDER #**	2110724
PROJECT	11-1324-0164	**REPORTED**	Nov-30-12

QC Qualifiers:

BLK	Analyte concentration in method blank is above the reporting limit. Data accepted based on acceptable performance of other batch QC.
RA3	Reported Detection Limit (RDL) for this analyte has been raised due to blank contamination.
RA4	This in an estimated value. The result was over the calibration range, and further dilution was not possible.
RPD	Relative percent difference (RPD) of duplicate analysis are outside of control limits. Data accepted based on acceptable performance of other batch QC.
SPK	Recovery of one or more analytes on Blank Spike (BS) analysis are outside of control limits. Data accepted based on acceptable performance of other batch QC.

Analytical Report

Work Order: AVK0120

Project Description

Westmount - Calgary

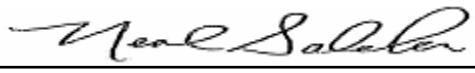
For:

Julie Burghardt

Golder Associates Ltd.

500-4260 Still Creek Drive

Burnaby, British Columbia, CANADA V5C6C6



Neal Salcher

Project Manager

Neal.Salcher@testamericainc.com

Thursday, December 13, 2012

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

14050 Summit Drive, Suite A100 Austin, TX 78728 * 512-244-0855 * Fax 512-244-0160

Golder Associates Ltd. 500-4260 Still Creek Drive Burnaby, British Columbia, CANADA V5C6C6 Julie Burghardt	Work Order: Project: Project Number:	AVK0120 AENV Canada Creosote 08-1436-0106	Received: Reported:	11/15/12 08:30 12/13/12 14:27

December 13, 2012

LABORATORY REPORT

Client:
Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Attn: Julie Burghardt

Work Order: AVK0120
Project Name: AENV Canada Creosote
Project Number: 08-1436-0106
Date Received: 11/15/12

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica.

TestAmerica Laboratories, Inc. certifies that the analytical results contained herein apply only to the specific sample(s) analyzed.

The Chain(s) of Custody, 2 pages, are included and are an integral part of this report. This entire report was reviewed and approved for release.

If you have any questions relating to this analytical report, please contact your Laboratory Project Manager at 512-244-0855.

Analyses included in this report were performed by the laboratory shown at the top of this report unless otherwise indicated.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

14050 Summit Drive, Suite A100 Austin, TX 78728 * 512-244-0855 * Fax 512-244-0160

Golder Associates Ltd.	Work Order:	AVK0120	Received: 11/15/12 08:30
500-4260 Still Creek Drive			Reported: 12/13/12 14:27
Burnaby, British Columbia, CANADA V5C6C6	Project:	AENV Canada Creosote	
Julie Burghardt	Project Number:	08-1436-0106	

08-1436-0106

This report contains results for the samples received under chain-of-custody by TestAmerica Laboratories, Inc. 11/15/2012 8:30:00 AM .

These samples are associated with your **AENV Canada Creosote** project.

All samples were received in good condition and within temperature requirements.

All applicable quality control procedures met method specified acceptance criteria except where flagged on the result pages, noted on the C-O-C Addendum, and/or detailed in the case narrative.

Samples 02 and 03 had high levels of the first ISTD in the samples, causing a low bias for target compounds and surrogates quantitated against it. The samples were re-analyzed using a smaller volume to minimize the bias.The results for compounds quantitated against the first ISTD are reported from the reanalysis.

Sample 03 also had a problem with the canister valve after the first analysis, so we could not analyze for ethene, acetylene and ethane, as these analytes are not calibrated for on the instrument the sample was initially analyzed on.

If you should have any questions, please feel free to contact me at neal.salcher@testamericainc.com or (512) 310-5215.

Note that if this report contains tests performed for the following methods, the associated method deviations are applicable.
EPA 410.4, COD: Laboratory uses different analytical wavelength as specified by instrument manufacturer.
EPA 340.2, Fluoride: Preliminary Bellack distillation not performed.
EPA 624: The laboratory uses a different desorb time and purge volume than stated in the method.
Iowa OA1: Benzene, toluene, ethylbenzene and xylenes (BTEX) are not analyzed along with the Gasoline Range Organics if client does not require BTEX.
EPA TO-12: Samples not analyzed in duplicate.
EPA TO-14A and TO-15: Zero humidified nitrogen is used in place of air for method blanks.

Approved By:

Neal Salcher
Project Manager

NELAP Certification # T104704217-10-6

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
14050 Summit Drive, Suite A100 Austin, TX 78728 * 512-244-0855 * Fax 512-244-0160

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

SAMPLE IDENTIFICATION	LAB NUMBER	COLLECTION	MATRIX	CONTAINER TYPE
MW10-6-W	AVK0120-01	11/12/12 10:11	Air	Passivated Canister
MW11-09-S	AVK0120-02	11/12/12 10:43	Air	Passivated Canister
MW11-08-D	AVK0120-03	11/12/12 12:13	Air	Passivated Canister

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
14050 Summit Drive, Suite A100 Austin, TX 78728 * 512-244-0855 * Fax 512-244-0160

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Sample ID: AVK0120-01 (MW10-6-W - Air) **Sampled: 11/12/12 10:11**

EPA TO15 - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Ethene	**13.1**		ppbv	0.450	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Acetylene	ND	U	ppbv	0.717	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Ethane	**4.76**	J	ppbv	0.353	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Halocarbon 134A	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Propylene	**1.64**	J	ppbv	0.379	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Chlorodifluoromethane	ND	U	ppbv	0.697	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Propane	**2.06**	J	ppbv	0.361	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Dichlorodifluoromethane	**0.484**	J	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Chloromethane	**0.827**	J	ppbv	0.304	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Isobutane	ND	U	ppbv	0.380	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Acetaldehyde	ND	U	ppbv	1.30	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Vinyl chloride	ND	U	ppbv	0.352	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1-Butene/Isobutene	**0.648**	J	ppbv	0.406	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,3-Butadiene	ND	U	ppbv	0.328	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Butane	**0.847**	J	ppbv	0.328	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Methanol	**6.99**	RA	ppbv	1.48	5.04	25.2	11/21/12 06:40	GCMSR1	KDK	12K0167
trans-2-Butene	ND	U	ppbv	0.340	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Neopentane	ND	U	ppbv	0.393	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Dichlorofluoromethane	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Bromomethane	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
cis-2-Butene	ND	U	ppbv	0.357	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Chloroethane	ND	U	ppbv	0.266	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Vinyl bromide	ND	U	ppbv	0.683	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
3-Methyl-1-butene	ND	U	ppbv	0.318	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Ethanol	**1.62**	RA,J	ppbv	1.30	5.04	25.2	11/21/12 06:40	GCMSR1	KDK	12K0167
Acetonitrile	ND	U	ppbv	0.426	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Isopentane	ND	U	ppbv	0.699	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Trichlorofluoromethane	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1-Pentene	ND	U	ppbv	0.338	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Acetone	**2.55**	J, B	ppbv	0.320	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Isopropyl alcohol	ND	RA,U	ppbv	0.408	5.04	25.2	11/21/12 06:40	GCMSR1	KDK	12K0167
Acrylonitrile	ND	U	ppbv	1.35	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
n-Pentane	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Diethyl ether	ND	U	ppbv	0.676	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Isoprene	ND	U	ppbv	0.316	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
trans-2-Pentene	ND	U	ppbv	0.453	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,1-Dichloroethene	ND	U	ppbv	0.446	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
cis-2-Pentene	ND	U	ppbv	0.346	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Methylene chloride	ND	U	ppbv	0.378	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Sample ID: AVK0120-01 (MW10-6-W - Air) - cont. **Sampled: 11/12/12 10:11**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
2-Methyl-2-butene	ND	U	ppbv	0.296	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Carbon disulfide	ND	U	ppbv	1.27	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Allyl chloride	ND	U	ppbv	0.368	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,1,2-Trichlorotrifluoroethane	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2,2-Dimethylbutane	ND	U	ppbv	0.351	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Cyclopentene	ND	U	ppbv	0.293	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
trans-1,2-Dichloroethene	ND	U	ppbv	0.724	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
4-Methyl-1-pentene	ND	U	ppbv	0.272	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Propanol	ND	RA,U	ppbv	1.43	5.04	25.2	11/21/12 06:40	GCMSR1	KDK	12K0167
1,1-Dichloroethane	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Cyclopentane	ND	U	ppbv	0.299	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2,3-Dimethylbutane	ND	U	ppbv	0.259	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Methyl tert-Butyl Ether	ND	U	ppbv	0.690	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Isohexane	ND	U	ppbv	0.292	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Vinyl acetate	ND	U	ppbv	1.59	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
cis/trans-4-Methyl-2-pentene	ND	U	ppbv	0.756	10.1	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Butyraldehyde	ND	U	ppbv	1.29	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2-Butanone (MEK)	ND	U	ppbv	0.738	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Chloroprene	ND	U	ppbv	0.266	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
3-Methylpentane	ND	U	ppbv	0.321	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2-Methyl-1-pentene	ND	U	ppbv	0.322	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1-Hexene	ND	U	ppbv	0.678	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
cis-1,2-Dichloroethene	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Bromochloromethane	ND	U	ppbv	0.385	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2-Ethyl-1-butene	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Hexane	ND	U	ppbv	0.338	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Chloroform	**0.459**	J	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
cis-3-Hexene	ND	U	ppbv	0.382	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
trans-2-Hexene	ND	U	ppbv	0.281	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2-Methyl-2-pentene	ND	U	ppbv	0.363	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
cis-3-Methyl-2-pentene	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
cis-2-Hexene	ND	U	ppbv	0.717	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Methylcyclopentane	ND	U	ppbv	0.277	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,2-Dichloroethane	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2,4-Dimethylpentane	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,1,1-Trichloroethane	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1-Methylcyclopentene	ND	U	ppbv	0.382	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Benzene	ND	U	ppbv	0.282	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Carbon tetrachloride	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
n-Butanol	ND	RA,U	ppbv	1.26	5.04	25.2	11/21/12 06:40	GCMSR1	KDK	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Sample ID: AVK0120-01 (MW10-6-W - Air) - cont. **Sampled: 11/12/12 10:11**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Cyclohexane	ND	U	ppbv	0.274	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Isoheptane	**0.663**	J	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2,3-Dimethylpentane	ND	U	ppbv	0.378	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Cyclohexene	ND	U	ppbv	0.171	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
3-Methylhexane	**0.681**	J	ppbv	0.315	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,2-Dichloropropane	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Bromodichloromethane	ND	U	ppbv	0.385	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Trichloroethene	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,4-Dioxane	ND	RA,U	ppbv	1.00	5.04	25.2	11/21/12 06:40	GCMSR1	KDK	12K0167
1-Heptene	**0.827**	J	ppbv	0.690	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2,2,4-Trimethylpentane	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
trans-3-Heptene	ND	U	ppbv	0.367	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Heptane	**2.31**	J	ppbv	0.258	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
cis-3-Heptene	ND	U	ppbv	0.156	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
trans-2-Heptene	ND	U	ppbv	0.186	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2,4,4-Trimethyl-1-pentene	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
cis-1,3-Dichloropropene	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
4-Methyl-2-pentanone (MIBK)	ND	U	ppbv	0.731	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Methylcyclohexane	**1.81**	J	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2,4,4-Trimethyl-2-pentene	ND	U	ppbv	0.385	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2,5-Dimethylhexane	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2,2,3-Trimethylpentane	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
trans-1,3-Dichloropropene	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,1,2-Trichloroethane	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2,3,4-Trimethylpentane	ND	U	ppbv	0.258	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Toluene	**3.39**	J	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2-Hexanone	ND	U	ppbv	0.255	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2-Methylheptane	**5.70**		ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1-Methylcyclohexene	ND	U	ppbv	0.385	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Chlorodibromomethane	ND	U	ppbv	0.385	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
3-Methylheptane	**1.72**	J	ppbv	0.724	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Hexanal	**1.52**	J	ppbv	0.580	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,2-Dibromoethane (EDB)	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2,2,5-Trimethylhexane	ND	U	ppbv	0.385	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1-Octene	**1.32**	J	ppbv	0.194	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
n-Octane	**8.84**		ppbv	0.378	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Tetrachloroethene	**2.76**	J	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
cis-2-Octene	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Chlorobenzene	ND	U	ppbv	0.378	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Ethylbenzene	**5.54**		ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Sample ID: AVK0120-01 (MW10-6-W - Air) - cont. **Sampled: 11/12/12 10:11**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
m-Xylene & p-Xylene	**24.0**		ppbv	0.748	10.1	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Bromoform	ND	U	ppbv	0.385	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Butyl acrylate	ND	U	ppbv	1.27	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Heptanal	ND	U	ppbv	1.27	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Styrene	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,1,2,2-Tetrachloroethane	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
o-Xylene	**19.0**		ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Xylenes, total	**43.0**		ppbv	0.556	15.1	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1-Nonene	ND	U	ppbv	0.690	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
4-Nonene	ND	U	ppbv	0.147	10.1	25.2	11/22/12 06:41	VMSC	KDK	12K0181
n-Nonane	**3.84**	J	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Isopropylbenzene	**5.40**		ppbv	0.724	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Benzaldehyde	ND	U	ppbv	0.402	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
alpha-Pinene	**32.0**		ppbv	0.378	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2 & 3-Chlorotoluene	ND	U	ppbv	0.752	10.1	25.2	11/22/12 06:41	VMSC	KDK	12K0181
4-Chlorotoluene	ND	U	ppbv	0.683	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
n-Propylbenzene	**4.44**	J	ppbv	0.378	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
3-Ethyltoluene	**109**		ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
4-Ethyltoluene	**55.9**		ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,3,5-Trimethylbenzene	**152**		ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
2-Ethyltoluene	**31.1**		ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
beta-Pinene	**4.85**	J	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,2,4-Trimethylbenzene	**281**	RA	ppbv	6.13	82.6	413	12/01/12 07:22	VMSC	KRW	12K0235
tert-Butylbenzene	ND	U	ppbv	0.385	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1-Decene	ND	U	ppbv	0.690	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Benzyl chloride	ND	U	ppbv	1.34	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,3-Dichlorobenzene	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
n-Decane	**50.9**		ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,4-Dichlorobenzene	ND	U	ppbv	0.374	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Isobutylbenzene	**1.29**	J	ppbv	0.385	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,2,3-Trimethylbenzene	**118**		ppbv	0.731	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
4-Isopropyltoluene	**85.7**		ppbv	0.718	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,2-Dichlorobenzene	ND	U	ppbv	0.371	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Limonene	**21.4**		ppbv	0.697	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Indan	**588**	RA	ppbv	6.31	82.6	413	12/01/12 07:22	VMSC	KRW	12K0235
Indene	**169**	RA	ppbv	2.86	82.6	413	12/01/12 07:22	VMSC	KRW	12K0235
1,3-Diethylbenzene	**24.2**		ppbv	0.724	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,4-Diethylbenzene	**9.60**		ppbv	0.717	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
n-Butylbenzene	ND	U	ppbv	0.186	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1-Undecene	ND	U	ppbv	0.359	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AVK0120-01 (MW10-6-W - Air) - cont.							**Sampled: 11/12/12 10:11**			
EPA TO15 - Volatile Organic Compounds by GC/MS - cont.										
n-Undecane	**95.0**		ppbv	0.199	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,2,4-Trichlorobenzene	ND	U	ppbv	0.362	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
Naphthalene	**1990**	RA,B	ppbv	9.73	82.6	413	12/01/12 07:22	VMSC	KRW	12K0235
Hexachlorobutadiene	ND	U	ppbv	0.377	5.04	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,2-Dichloroethene, Total	ND	U	ppbv	0.724	10.1	25.2	11/22/12 06:41	VMSC	KDK	12K0181
1,2-Dichloroethene, Total	ND	RA,U	ppbv	1.08	10.1	25.2	11/21/12 06:40	GCMSR1	KDK	12K0167
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*100 %*						11/22/12 06:41	VMSC	KDK	12K0181
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*92 %*	*RA*					11/21/12 06:40	GCMSR1	KDK	12K0167
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*104 %*	*RA*					12/01/12 07:22	VMSC	KRW	12K0235
Surr: Fluorobenzene (46-118%)	*81 %*						11/22/12 06:41	VMSC	KDK	12K0181
Surr: Fluorobenzene (46-118%)	*76 %*	*RA*					11/21/12 06:40	GCMSR1	KDK	12K0167
Surr: Fluorobenzene (46-118%)	*87 %*	*RA*					12/01/12 07:22	VMSC	KRW	12K0235
Surr: Toluene-d8 (70-136%)	*92 %*						11/22/12 06:41	VMSC	KDK	12K0181
Surr: Toluene-d8 (70-136%)	*94 %*	*RA*					11/21/12 06:40	GCMSR1	KDK	12K0167
Surr: Toluene-d8 (70-136%)	*97 %*	*RA*					12/01/12 07:22	VMSC	KRW	12K0235
Surr: 1,4-Dichlorobutane (38-135%)	*86 %*						11/22/12 06:41	VMSC	KDK	12K0181
Surr: 1,4-Dichlorobutane (38-135%)	*104 %*	*RA*					11/21/12 06:40	GCMSR1	KDK	12K0167
Surr: 1,4-Dichlorobutane (38-135%)	*87 %*	*RA*					12/01/12 07:22	VMSC	KRW	12K0235
Surr: 4-Bromofluorobenzene (51-128%)	*87 %*						11/22/12 06:41	VMSC	KDK	12K0181
Surr: 4-Bromofluorobenzene (51-128%)	*104 %*	*RA*					11/21/12 06:40	GCMSR1	KDK	12K0167
Surr: 4-Bromofluorobenzene (51-128%)	*85 %*	*RA*					12/01/12 07:22	VMSC	KRW	12K0235

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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Sample ID: AVK0120-02 (MW11-09-S - Air) **Sampled: 11/12/12 10:43**

EPA TO15 - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Ethene	ND	RA,U	ppbv	0.473	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Acetylene	ND	RA,U	ppbv	0.754	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Ethane	**0.493**	RA,J	ppbv	0.371	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Halocarbon 134A	ND	RA,U	ppbv	0.394	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Propylene	ND	RA,U	ppbv	0.398	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Chlorodifluoromethane	ND	RA,U	ppbv	0.733	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Propane	ND	RA,U	ppbv	0.380	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Dichlorodifluoromethane	ND	RA,U	ppbv	0.390	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Chloromethane	ND	RA,U	ppbv	0.320	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Isobutane	ND	RA,U	ppbv	0.400	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	RA,U	ppbv	0.390	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Acetaldehyde	ND	RA,U	ppbv	1.36	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Vinyl chloride	ND	RA,U	ppbv	0.370	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
1-Butene/Isobutene	ND	RA,U	ppbv	0.427	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
1,3-Butadiene	ND	RA,U	ppbv	0.345	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Butane	ND	RA,U	ppbv	0.345	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Methanol	**5.81**	RA,B	ppbv	1.55	5.31	26.5	11/20/12 03:18	GCMSR1	KDK	12K0154
trans-2-Butene	ND	RA,U	ppbv	0.358	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Neopentane	ND	RA,U	ppbv	0.413	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Dichlorofluoromethane	ND	RA,U	ppbv	0.394	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Bromomethane	ND	RA,U	ppbv	0.394	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
cis-2-Butene	ND	RA,U	ppbv	0.376	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Chloroethane	ND	RA,U	ppbv	0.280	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Vinyl bromide	ND	RA,U	ppbv	0.719	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
3-Methyl-1-butene	ND	RA,U	ppbv	0.334	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Ethanol	**2.05**	RA,J	ppbv	1.37	5.31	26.5	11/20/12 03:18	GCMSR1	KDK	12K0154
Acetonitrile	ND	RA,U	ppbv	0.448	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Isopentane	ND	RA,U	ppbv	0.736	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Trichlorofluoromethane	ND	RA,U	ppbv	0.390	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
1-Pentene	ND	RA,U	ppbv	0.355	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Acetone	**0.687**	RA,J, B	ppbv	0.337	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Isopropyl alcohol	ND	RA,U	ppbv	0.430	5.31	26.5	11/20/12 03:18	GCMSR1	KDK	12K0154
Acrylonitrile	ND	RA,U	ppbv	1.42	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
n-Pentane	ND	RA,U	ppbv	0.394	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Diethyl ether	ND	RA,U	ppbv	0.711	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Isoprene	ND	RA,U	ppbv	0.333	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
trans-2-Pentene	ND	RA,U	ppbv	0.476	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
1,1-Dichloroethene	ND	RA,U	ppbv	0.469	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
cis-2-Pentene	ND	RA,U	ppbv	0.364	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Methylene chloride	ND	RA,U	ppbv	0.398	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Sample ID: AVK0120-02 (MW11-09-S - Air) - cont. **Sampled: 11/12/12 10:43**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
2-Methyl-2-butene	ND	RA,U	ppbv	0.311	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Carbon disulfide	**1.69**	RA,J	ppbv	1.34	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Allyl chloride	ND	RA,U	ppbv	0.387	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
1,1,2-Trichlorotrifluoroethane	ND	RA,U	ppbv	0.394	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
2,2-Dimethylbutane	ND	RA,U	ppbv	0.369	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Cyclopentene	ND	RA,U	ppbv	0.309	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
trans-1,2-Dichloroethene	ND	RA,U	ppbv	0.762	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
4-Methyl-1-pentene	ND	RA,U	ppbv	0.286	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Propanol	ND	RA,U	ppbv	1.51	5.31	26.5	11/20/12 03:18	GCMSR1	KDK	12K0154
1,1-Dichloroethane	ND	RA,U	ppbv	0.394	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Cyclopentane	ND	RA,U	ppbv	0.315	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
2,3-Dimethylbutane	ND	RA,U	ppbv	0.273	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Methyl tert-Butyl Ether	ND	RA,U	ppbv	0.726	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Isohexane	ND	RA,U	ppbv	0.307	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Vinyl acetate	ND	RA,U	ppbv	1.67	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
cis/trans-4-Methyl-2-pentene	ND	RA,U	ppbv	0.795	10.6	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Butyraldehyde	ND	RA,U	ppbv	1.35	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
2-Butanone (MEK)	ND	RA,U	ppbv	0.776	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Chloroprene	ND	RA,U	ppbv	0.280	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
3-Methylpentane	ND	RA,U	ppbv	0.338	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
2-Methyl-1-pentene	ND	RA,U	ppbv	0.339	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
1-Hexene	ND	RA,U	ppbv	0.713	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
cis-1,2-Dichloroethene	ND	RA,U	ppbv	0.394	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Bromochloromethane	ND	RA,U	ppbv	0.405	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
2-Ethyl-1-butene	ND	RA,U	ppbv	0.390	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Hexane	ND	RA,U	ppbv	0.356	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Chloroform	ND	RA,U	ppbv	0.394	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
cis-3-Hexene	ND	RA,U	ppbv	0.401	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
trans-2-Hexene	ND	RA,U	ppbv	0.296	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
2-Methyl-2-pentene	ND	RA,U	ppbv	0.382	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
cis-3-Methyl-2-pentene	ND	RA,U	ppbv	0.390	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
cis-2-Hexene	ND	RA,U	ppbv	0.754	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Methylcyclopentane	ND	RA,U	ppbv	0.291	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
1,2-Dichloroethane	ND	RA,U	ppbv	0.394	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
2,4-Dimethylpentane	ND	RA,U	ppbv	0.394	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
1,1,1-Trichloroethane	ND	RA,U	ppbv	0.390	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
1-Methylcyclopentene	ND	U	ppbv	0.0803	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Benzene	**0.568**	J	ppbv	0.0594	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Carbon tetrachloride	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
n-Butanol	**2.46**	RA	ppbv	0.265	1.06	5.31	11/20/12 02:21	GCMSR1	KDK	12K0154

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Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Sample ID: AVK0120-02 (MW11-09-S - Air) - cont. **Sampled: 11/12/12 10:43**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Cyclohexane	ND	U	ppbv	0.0576	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Isoheptane	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
2,3-Dimethylpentane	ND	U	ppbv	0.0795	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Cyclohexene	ND	U	ppbv	0.0360	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
3-Methylhexane	ND	U	ppbv	0.0664	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,2-Dichloropropane	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Bromodichloromethane	ND	U	ppbv	0.0811	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Trichloroethene	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,4-Dioxane	ND	RA,U	ppbv	0.211	1.06	5.31	11/20/12 02:21	GCMSR1	KDK	12K0154
1-Heptene	ND	U	ppbv	0.145	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
2,2,4-Trimethylpentane	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
trans-3-Heptene	ND	U	ppbv	0.0772	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Heptane	ND	U	ppbv	0.0543	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
cis-3-Heptene	ND	U	ppbv	0.0329	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
trans-2-Heptene	ND	U	ppbv	0.0391	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
2,4,4-Trimethyl-1-pentene	ND	U	ppbv	0.0780	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
cis-1,3-Dichloropropene	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
4-Methyl-2-pentanone (MIBK)	ND	U	ppbv	0.154	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Methylcyclohexane	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
2,4,4-Trimethyl-2-pentene	ND	U	ppbv	0.0811	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
2,5-Dimethylhexane	ND	U	ppbv	0.0780	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
2,2,3-Trimethylpentane	ND	U	ppbv	0.0780	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
trans-1,3-Dichloropropene	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,1,2-Trichloroethane	ND	U	ppbv	0.0780	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
2,3,4-Trimethylpentane	ND	U	ppbv	0.0544	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Toluene	**186**	RA	ppbv	0.394	5.31	26.5	11/22/12 05:45	VMSC	KDK	12K0181
2-Hexanone	ND	U	ppbv	0.0536	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
2-Methylheptane	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1-Methylcyclohexene	ND	U	ppbv	0.0811	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Chlorodibromomethane	ND	U	ppbv	0.0811	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
3-Methylheptane	ND	U	ppbv	0.152	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Hexanal	**0.353**	J	ppbv	0.122	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,2-Dibromoethane (EDB)	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
2,2,5-Trimethylhexane	ND	U	ppbv	0.0811	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1-Octene	ND	U	ppbv	0.0408	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
n-Octane	ND	U	ppbv	0.0795	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Tetrachloroethene	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
cis-2-Octene	ND	U	ppbv	0.0780	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Chlorobenzene	ND	U	ppbv	0.0795	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Ethylbenzene	**0.129**	J	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Sample ID: AVK0120-02 (MW11-09-S - Air) - cont. **Sampled: 11/12/12 10:43**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
m-Xylene & p-Xylene	**0.279**	J	ppbv	0.157	2.12	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Bromoform	ND	U	ppbv	0.0811	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Butyl acrylate	ND	U	ppbv	0.268	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Heptanal	ND	U	ppbv	0.268	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Styrene	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,1,2,2-Tetrachloroethane	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
o-Xylene	**0.159**	J	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Xylenes, total	**0.438**	J	ppbv	0.117	3.18	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1-Nonene	ND	U	ppbv	0.145	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
4-Nonene	ND	U	ppbv	0.0309	2.12	5.31	11/22/12 04:48	VMSC	KDK	12K0181
n-Nonane	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Isopropylbenzene	ND	U	ppbv	0.152	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Benzaldehyde	ND	U	ppbv	0.0847	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
alpha-Pinene	ND	U	ppbv	0.0795	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
2 & 3-Chlorotoluene	ND	U	ppbv	0.158	2.12	5.31	11/22/12 04:48	VMSC	KDK	12K0181
4-Chlorotoluene	ND	U	ppbv	0.144	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
n-Propylbenzene	ND	U	ppbv	0.0795	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
3-Ethyltoluene	**0.112**	J	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
4-Ethyltoluene	ND	U	ppbv	0.0780	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,3,5-Trimethylbenzene	**0.115**	J	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
2-Ethyltoluene	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
beta-Pinene	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,2,4-Trimethylbenzene	**0.301**	J	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
tert-Butylbenzene	ND	U	ppbv	0.0811	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1-Decene	ND	U	ppbv	0.145	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Benzyl chloride	ND	U	ppbv	0.281	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,3-Dichlorobenzene	ND	U	ppbv	0.0780	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
n-Decane	**0.886**	J	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,4-Dichlorobenzene	ND	U	ppbv	0.0787	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Isobutylbenzene	ND	U	ppbv	0.0811	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,2,3-Trimethylbenzene	ND	U	ppbv	0.154	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
4-Isopropyltoluene	ND	U	ppbv	0.151	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,2-Dichlorobenzene	ND	U	ppbv	0.0780	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Limonene	ND	U	ppbv	0.147	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Indan	**0.524**	J	ppbv	0.0811	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Indene	**0.159**	J	ppbv	0.0367	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,3-Diethylbenzene	ND	U	ppbv	0.152	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,4-Diethylbenzene	ND	U	ppbv	0.151	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
n-Butylbenzene	ND	U	ppbv	0.0392	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1-Undecene	ND	U	ppbv	0.0755	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181

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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AVK0120-02 (MW11-09-S - Air) - cont.							**Sampled: 11/12/12 10:43**			
EPA TO15 - Volatile Organic Compounds by GC/MS - cont.										
n-Undecane	**0.109**	J	ppbv	0.0419	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,2,4-Trichlorobenzene	ND	U	ppbv	0.0761	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Naphthalene	**0.312**	J, B	ppbv	0.125	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
Hexachlorobutadiene	ND	U	ppbv	0.0794	1.06	5.31	11/22/12 04:48	VMSC	KDK	12K0181
1,2-Dichloroethene, Total	ND	RA,U	ppbv	0.762	10.6	26.5	11/22/12 05:45	VMSC	KDK	12K0181
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*20 %*	*ZX, I2*					11/22/12 04:48	VMSC	KDK	12K0181
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*22 %*	*RA,ZX, I2*					11/20/12 02:21	GCMSR1	KDK	12K0154
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*57 %*	*RA,ZX*					11/20/12 03:18	GCMSR1	KDK	12K0154
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*63 %*	*RA*					11/22/12 05:45	VMSC	KDK	12K0181
Surr: Fluorobenzene (46-118%)	*16 %*	*ZX, I2*					11/22/12 04:48	VMSC	KDK	12K0181
Surr: Fluorobenzene (46-118%)	*19 %*	*RA,ZX, I2*					11/20/12 02:21	GCMSR1	KDK	12K0154
Surr: Fluorobenzene (46-118%)	*48 %*	*RA*					11/20/12 03:18	GCMSR1	KDK	12K0154
Surr: Fluorobenzene (46-118%)	*52 %*	*RA*					11/22/12 05:45	VMSC	KDK	12K0181
Surr: Toluene-d8 (70-136%)	*84 %*						11/22/12 04:48	VMSC	KDK	12K0181
Surr: Toluene-d8 (70-136%)	*102 %*	*RA*					11/20/12 02:21	GCMSR1	KDK	12K0154
Surr: Toluene-d8 (70-136%)	*103 %*	*RA*					11/20/12 03:18	GCMSR1	KDK	12K0154
Surr: Toluene-d8 (70-136%)	*97 %*	*RA*					11/22/12 05:45	VMSC	KDK	12K0181
Surr: 1,4-Dichlorobutane (38-135%)	*93 %*						11/22/12 04:48	VMSC	KDK	12K0181
Surr: 1,4-Dichlorobutane (38-135%)	*97 %*	*RA*					11/20/12 02:21	GCMSR1	KDK	12K0154
Surr: 1,4-Dichlorobutane (38-135%)	*96 %*	*RA*					11/20/12 03:18	GCMSR1	KDK	12K0154
Surr: 1,4-Dichlorobutane (38-135%)	*89 %*	*RA*					11/22/12 05:45	VMSC	KDK	12K0181
Surr: 4-Bromofluorobenzene (51-128%)	*88 %*						11/22/12 04:48	VMSC	KDK	12K0181
Surr: 4-Bromofluorobenzene (51-128%)	*91 %*	*RA*					11/20/12 02:21	GCMSR1	KDK	12K0154
Surr: 4-Bromofluorobenzene (51-128%)	*89 %*	*RA*					11/20/12 03:18	GCMSR1	KDK	12K0154
Surr: 4-Bromofluorobenzene (51-128%)	*83 %*	*RA*					11/22/12 05:45	VMSC	KDK	12K0181

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AVK0120-03 (MW11-08-D - Air)								**Sampled: 11/12/12 12:13**		
EPA TO15 - Volatile Organic Compounds by GC/MS										
Halocarbon 134A	ND	RA,U	ppbv	1.54	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Propylene	ND	RA,U	ppbv	0.832	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Chlorodifluoromethane	ND	RA,U	ppbv	0.530	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Propane	ND	RA,U	ppbv	5.93	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Dichlorodifluoromethane	ND	RA,U	ppbv	0.708	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Chloromethane	ND	RA,U	ppbv	0.436	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Isobutane	ND	RA,U	ppbv	0.769	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	RA,U	ppbv	2.22	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Acetaldehyde	ND	RA,U	ppbv	1.25	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Vinyl chloride	ND	RA,U	ppbv	0.878	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
1-Butene/Isobutene	ND	RA,U	ppbv	0.687	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
1,3-Butadiene	ND	RA,U	ppbv	0.575	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Butane	ND	RA,U	ppbv	0.554	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Methanol	**2.23**	RA,J	ppbv	1.77	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
trans-2-Butene	ND	RA,U	ppbv	0.629	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Neopentane	ND	RA,U	ppbv	0.744	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Dichlorofluoromethane	ND	RA,U	ppbv	0.772	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Bromomethane	ND	RA,U	ppbv	0.959	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
cis-2-Butene	ND	RA,U	ppbv	0.530	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Chloroethane	ND	RA,U	ppbv	0.750	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Vinyl bromide	ND	RA,U	ppbv	1.56	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
3-Methyl-1-butene	ND	RA,U	ppbv	0.672	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Ethanol	ND	RA,U	ppbv	1.56	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Acetonitrile	ND	RA,U	ppbv	1.57	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Isopentane	ND	RA,U	ppbv	0.315	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Trichlorofluoromethane	ND	RA,U	ppbv	0.430	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
1-Pentene	ND	RA,U	ppbv	0.478	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Acetone	ND	RA,U	ppbv	0.448	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Isopropyl alcohol	ND	RA,U	ppbv	0.490	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Acrylonitrile	ND	RA,U	ppbv	0.775	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
n-Pentane	ND	RA,U	ppbv	0.405	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Diethyl ether	ND	RA,U	ppbv	0.481	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Isoprene	ND	RA,U	ppbv	0.699	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
trans-2-Pentene	ND	RA,U	ppbv	0.747	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
1,1-Dichloroethene	ND	RA,U	ppbv	0.363	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
cis-2-Pentene	ND	RA,U	ppbv	0.926	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Methylene chloride	ND	RA,U	ppbv	0.554	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
2-Methyl-2-butene	ND	RA,U	ppbv	1.15	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Carbon disulfide	ND	RA,U	ppbv	1.36	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Allyl chloride	ND	RA,U	ppbv	0.923	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167

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Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Sample ID: AVK0120-03 (MW11-08-D - Air) - cont. **Sampled: 11/12/12 12:13**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
1,1,2-Trichlorotrifluoroethane	ND	RA,U	ppbv	0.796	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
2,2-Dimethylbutane	ND	RA,U	ppbv	0.699	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Cyclopentene	ND	RA,U	ppbv	0.772	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
trans-1,2-Dichloroethene	ND	RA,U	ppbv	0.778	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
4-Methyl-1-pentene	ND	RA,U	ppbv	0.578	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Propanol	ND	RA,U	ppbv	1.72	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
1,1-Dichloroethane	ND	RA,U	ppbv	0.599	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Cyclopentane	ND	RA,U	ppbv	0.699	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
2,3-Dimethylbutane	ND	RA,U	ppbv	0.593	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Methyl tert-Butyl Ether	ND	RA,U	ppbv	0.663	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Isohexane	ND	RA,U	ppbv	0.660	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Vinyl acetate	ND	RA,U	ppbv	1.19	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
cis/trans-4-Methyl-2-pentene	ND	RA,U	ppbv	0.714	12.1	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Butyraldehyde	ND	RA,U	ppbv	0.699	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
2-Butanone (MEK)	ND	RA,U	ppbv	0.805	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Chloroprene	ND	RA,U	ppbv	0.602	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
3-Methylpentane	ND	RA,U	ppbv	0.708	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
2-Methyl-1-pentene	ND	RA,U	ppbv	0.784	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
1-Hexene	ND	RA,U	ppbv	0.566	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
cis-1,2-Dichloroethene	ND	RA,U	ppbv	0.548	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Bromochloromethane	ND	RA,U	ppbv	0.799	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
2-Ethyl-1-butene	ND	RA,U	ppbv	1.51	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Hexane	ND	RA,U	ppbv	0.663	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Chloroform	ND	RA,U	ppbv	0.499	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
cis-3-Hexene	ND	RA,U	ppbv	1.56	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
trans-2-Hexene	ND	RA,U	ppbv	0.548	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
2-Methyl-2-pentene	ND	RA,U	ppbv	0.405	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
cis-3-Methyl-2-pentene	ND	RA,U	ppbv	0.424	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
cis-2-Hexene	ND	RA,U	ppbv	0.599	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
Methylcyclopentane	ND	RA,U	ppbv	0.593	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
1,2-Dichloroethane	ND	RA,U	ppbv	0.421	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
2,4-Dimethylpentane	ND	RA,U	ppbv	0.554	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
1,1,1-Trichloroethane	ND	RA,U	ppbv	0.587	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
1-Methylcyclopentene	ND	U	ppbv	0.0297	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Benzene	**0.126**	J	ppbv	0.126	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Carbon tetrachloride	**0.356**	J	ppbv	0.329	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
n-Butanol	**0.595**	J	ppbv	0.302	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Cyclohexane	ND	U	ppbv	0.150	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Isoheptane	ND	U	ppbv	0.0823	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
2,3-Dimethylpentane	ND	U	ppbv	0.0999	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167

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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Sample ID: AVK0120-03 (MW11-08-D - Air) - cont. **Sampled: 11/12/12 12:13**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Cyclohexene	ND	U	ppbv	0.306	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
3-Methylhexane	ND	U	ppbv	0.105	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,2-Dichloropropane	ND	U	ppbv	0.0962	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Bromodichloromethane	ND	U	ppbv	0.284	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Trichloroethene	ND	U	ppbv	0.0817	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,4-Dioxane	ND	U	ppbv	0.240	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1-Heptene	ND	U	ppbv	0.138	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
2,2,4-Trimethylpentane	ND	U	ppbv	0.119	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
trans-3-Heptene	ND	U	ppbv	0.182	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Heptane	ND	U	ppbv	0.0993	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
cis-3-Heptene	ND	U	ppbv	0.236	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
trans-2-Heptene	ND	U	ppbv	0.312	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
2,4,4-Trimethyl-1-pentene	ND	U	ppbv	0.309	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
cis-1,3-Dichloropropene	ND	U	ppbv	0.128	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
4-Methyl-2-pentanone (MIBK)	ND	U	ppbv	0.230	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Methylcyclohexane	ND	U	ppbv	0.145	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
2,4,4-Trimethyl-2-pentene	ND	U	ppbv	0.123	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
2,5-Dimethylhexane	ND	U	ppbv	0.0865	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
2,2,3-Trimethylpentane	ND	U	ppbv	0.134	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
trans-1,3-Dichloropropene	ND	U	ppbv	0.182	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,1,2-Trichloroethane	ND	U	ppbv	0.122	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
2,3,4-Trimethylpentane	ND	U	ppbv	0.0714	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Toluene	**121**	RA	ppbv	0.466	6.05	30.3	11/21/12 05:43	GCMSR1	KDK	12K0167
2-Hexanone	ND	U	ppbv	0.309	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
2-Methylheptane	ND	U	ppbv	0.105	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1-Methylcyclohexene	ND	U	ppbv	0.324	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Chlorodibromomethane	ND	U	ppbv	0.296	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
3-Methylheptane	ND	U	ppbv	0.0817	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Hexanal	**0.358**	J	ppbv	0.353	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,2-Dibromoethane (EDB)	ND	U	ppbv	0.121	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
2,2,5-Trimethylhexane	ND	U	ppbv	0.0926	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1-Octene	ND	U	ppbv	0.303	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
n-Octane	ND	U	ppbv	0.124	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Tetrachloroethene	ND	U	ppbv	0.101	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
cis-2-Octene	ND	U	ppbv	0.318	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Chlorobenzene	ND	U	ppbv	0.0878	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Ethylbenzene	ND	U	ppbv	0.169	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
m-Xylene & p-Xylene	ND	U	ppbv	0.372	2.42	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Bromoform	ND	U	ppbv	0.176	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Butyl acrylate	ND	U	ppbv	0.543	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167

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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Sample ID: AVK0120-03 (MW11-08-D - Air) - cont. **Sampled: 11/12/12 12:13**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Heptanal	ND	U	ppbv	0.364	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Styrene	ND	U	ppbv	0.324	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,1,2,2-Tetrachloroethane	ND	U	ppbv	0.392	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
o-Xylene	ND	U	ppbv	0.186	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Xylenes, total	ND	U	ppbv	0.554	3.63	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1-Nonene	ND	U	ppbv	0.176	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
4-Nonene	ND	U	ppbv	1.00	2.42	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
n-Nonane	ND	U	ppbv	0.172	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Isopropylbenzene	ND	U	ppbv	0.156	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Benzaldehyde	ND	U	ppbv	0.304	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
alpha-Pinene	ND	U	ppbv	0.151	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
2 & 3-Chlorotoluene	ND	U	ppbv	0.648	2.42	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
4-Chlorotoluene	ND	U	ppbv	0.327	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
n-Propylbenzene	ND	U	ppbv	0.244	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
3-Ethyltoluene	ND	U	ppbv	0.222	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
4-Ethyltoluene	ND	U	ppbv	0.260	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,3,5-Trimethylbenzene	ND	U	ppbv	0.199	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
2-Ethyltoluene	ND	U	ppbv	0.192	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
beta-Pinene	ND	U	ppbv	0.389	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,2,4-Trimethylbenzene	ND	U	ppbv	0.223	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
tert-Butylbenzene	ND	U	ppbv	0.0950	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1-Decene	ND	U	ppbv	0.297	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Benzyl chloride	ND	U	ppbv	0.333	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,3-Dichlorobenzene	ND	U	ppbv	0.317	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
n-Decane	**0.594**	J	ppbv	0.207	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,4-Dichlorobenzene	ND	U	ppbv	0.258	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Isobutylbenzene	ND	U	ppbv	0.197	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,2,3-Trimethylbenzene	ND	U	ppbv	0.170	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
4-Isopropyltoluene	ND	U	ppbv	0.414	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,2-Dichlorobenzene	ND	U	ppbv	0.403	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Limonene	ND	U	ppbv	0.151	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Indan	ND	U	ppbv	0.276	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Indene	ND	U	ppbv	0.173	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,3-Diethylbenzene	ND	U	ppbv	0.296	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,4-Diethylbenzene	ND	U	ppbv	0.302	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
n-Butylbenzene	ND	U	ppbv	0.0859	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1-Undecene	ND	U	ppbv	0.166	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
n-Undecane	ND	U	ppbv	0.152	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
1,2,4-Trichlorobenzene	ND	U	ppbv	0.140	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Naphthalene	**0.396**	J	ppbv	0.254	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AVK0120-03 (MW11-08-D - Air) - cont.							**Sampled: 11/12/12 12:13**			
EPA TO15 - Volatile Organic Compounds by GC/MS - cont.										
Hexachlorobutadiene	ND	U	ppbv	0.188	1.21	6.05	11/21/12 04:46	GCMSR1	KDK	12K0167
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*46 %*	*I2, ZX*					11/21/12 04:46	GCMSR1	KDK	12K0167
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*80 %*	*RA*					11/21/12 05:43	GCMSR1	KDK	12K0167
Surr: Fluorobenzene (46-118%)	*39 %*	*ZX, I2*					11/21/12 04:46	GCMSR1	KDK	12K0167
Surr: Fluorobenzene (46-118%)	*64 %*	*RA*					11/21/12 05:43	GCMSR1	KDK	12K0167
Surr: Toluene-d8 (70-136%)	*101 %*						11/21/12 04:46	GCMSR1	KDK	12K0167
Surr: Toluene-d8 (70-136%)	*105 %*	*RA*					11/21/12 05:43	GCMSR1	KDK	12K0167
Surr: 1,4-Dichlorobutane (38-135%)	*99 %*						11/21/12 04:46	GCMSR1	KDK	12K0167
Surr: 1,4-Dichlorobutane (38-135%)	*96 %*	*RA*					11/21/12 05:43	GCMSR1	KDK	12K0167
Surr: 4-Bromofluorobenzene (51-128%)	*93 %*						11/21/12 04:46	GCMSR1	KDK	12K0167
Surr: 4-Bromofluorobenzene (51-128%)	*90 %*	*RA*					11/21/12 05:43	GCMSR1	KDK	12K0167

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PROJECT QUALITY CONTROL DATA

Blank

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0154-BLK1 (Blank - Air)										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Ethene	ND	U	ppbv	0.0272	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Acetylene	ND	U	ppbv	0.133	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Ethane	ND	U	ppbv	0.119	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Halocarbon 134A	ND	U	ppbv	0.102	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Propylene	ND	U	ppbv	0.0550	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Chlorodifluoromethane	ND	U	ppbv	0.0350	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Propane	ND	U	ppbv	0.392	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Dichlorodifluoromethane	ND	U	ppbv	0.0468	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Chloromethane	ND	U	ppbv	0.0288	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Isobutane	ND	U	ppbv	0.0508	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ppbv	0.147	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Acetaldehyde	ND	U	ppbv	0.0824	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Vinyl chloride	ND	U	ppbv	0.0580	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1-Butene/Isobutene	ND	U	ppbv	0.0454	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,3-Butadiene	ND	U	ppbv	0.0380	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Butane	ND	U	ppbv	0.0366	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Methanol	**0.290**	**J**	ppbv	0.117	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
trans-2-Butene	ND	U	ppbv	0.0416	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Neopentane	ND	U	ppbv	0.0492	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Dichlorofluoromethane	ND	U	ppbv	0.0510	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Bromomethane	ND	U	ppbv	0.0634	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
cis-2-Butene	ND	U	ppbv	0.0350	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Chloroethane	ND	U	ppbv	0.0496	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Vinyl bromide	ND	U	ppbv	0.103	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
3-Methyl-1-butene	ND	U	ppbv	0.0444	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Ethanol	ND	U	ppbv	0.103	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Acetonitrile	ND	U	ppbv	0.104	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Isopentane	ND	U	ppbv	0.0208	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Trichlorofluoromethane	ND	U	ppbv	0.0284	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1-Pentene	ND	U	ppbv	0.0316	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Acetone	**0.108**	**J**	ppbv	0.0296	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Isopropyl alcohol	ND	U	ppbv	0.0324	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Acrylonitrile	ND	U	ppbv	0.0512	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
n-Pentane	ND	U	ppbv	0.0268	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Diethyl ether	ND	U	ppbv	0.0318	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Isoprene	ND	U	ppbv	0.0462	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154

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Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0154-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
trans-2-Pentene	ND	U	ppbv	0.0494	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,1-Dichloroethene	ND	U	ppbv	0.0240	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
cis-2-Pentene	ND	U	ppbv	0.0612	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Methylene chloride	ND	U	ppbv	0.0366	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2-Methyl-2-butene	ND	U	ppbv	0.0758	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Carbon disulfide	ND	U	ppbv	0.0898	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Allyl chloride	ND	U	ppbv	0.0610	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,1,2-Trichlorotrifluoroethane	ND	U	ppbv	0.0526	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2,2-Dimethylbutane	ND	U	ppbv	0.0462	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Cyclopentene	ND	U	ppbv	0.0510	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
trans-1,2-Dichloroethene	ND	U	ppbv	0.0514	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
4-Methyl-1-pentene	ND	U	ppbv	0.0382	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Propanol	ND	U	ppbv	0.114	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,1-Dichloroethane	ND	U	ppbv	0.0396	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Cyclopentane	ND	U	ppbv	0.0462	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2,3-Dimethylbutane	ND	U	ppbv	0.0392	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Methyl tert-Butyl Ether	ND	U	ppbv	0.0438	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Isohexane	ND	U	ppbv	0.0436	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Vinyl acetate	ND	U	ppbv	0.0784	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
cis/trans-4-Methyl-2-pentene	ND	U	ppbv	0.0472	0.800	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Butyraldehyde	ND	U	ppbv	0.0462	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2-Butanone (MEK)	ND	U	ppbv	0.0532	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Chloroprene	ND	U	ppbv	0.0398	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
3-Methylpentane	ND	U	ppbv	0.0468	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2-Methyl-1-pentene	ND	U	ppbv	0.0518	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1-Hexene	ND	U	ppbv	0.0374	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
cis-1,2-Dichloroethene	ND	U	ppbv	0.0362	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Bromochloromethane	ND	U	ppbv	0.0528	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2-Ethyl-1-butene	ND	U	ppbv	0.100	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Hexane	ND	U	ppbv	0.0438	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Chloroform	ND	U	ppbv	0.0330	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
cis-3-Hexene	ND	U	ppbv	0.103	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
trans-2-Hexene	ND	U	ppbv	0.0362	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2-Methyl-2-pentene	ND	U	ppbv	0.0268	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
cis-3-Methyl-2-pentene	ND	U	ppbv	0.0280	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
cis-2-Hexene	ND	U	ppbv	0.0396	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154

Golder Associates Ltd.
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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0154-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Methylcyclopentane	ND	U	ppbv	0.0392	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,2-Dichloroethane	ND	U	ppbv	0.0278	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2,4-Dimethylpentane	ND	U	ppbv	0.0366	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,1,1-Trichloroethane	ND	U	ppbv	0.0388	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1-Methylcyclopentene	ND	U	ppbv	0.00980	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Benzene	ND	U	ppbv	0.0418	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Carbon tetrachloride	ND	U	ppbv	0.109	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
n-Butanol	ND	U	ppbv	0.0998	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Cyclohexane	ND	U	ppbv	0.0496	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Isoheptane	ND	U	ppbv	0.0272	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2,3-Dimethylpentane	ND	U	ppbv	0.0330	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Cyclohexene	ND	U	ppbv	0.101	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
3-Methylhexane	ND	U	ppbv	0.0346	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,2-Dichloropropane	ND	U	ppbv	0.0318	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Bromodichloromethane	ND	U	ppbv	0.0938	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Trichloroethene	ND	U	ppbv	0.0270	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,4-Dioxane	ND	U	ppbv	0.0794	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1-Heptene	ND	U	ppbv	0.0456	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2,2,4-Trimethylpentane	ND	U	ppbv	0.0394	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
trans-3-Heptene	ND	U	ppbv	0.0600	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Heptane	ND	U	ppbv	0.0328	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
cis-3-Heptene	ND	U	ppbv	0.0780	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
trans-2-Heptene	ND	U	ppbv	0.103	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2,4,4-Trimethyl-1-pentene	ND	U	ppbv	0.102	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
cis-1,3-Dichloropropene	ND	U	ppbv	0.0422	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
4-Methyl-2-pentanone (MIBK)	ND	U	ppbv	0.0760	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Methylcyclohexane	ND	U	ppbv	0.0480	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2,4,4-Trimethyl-2-pentene	ND	U	ppbv	0.0408	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2,5-Dimethylhexane	ND	U	ppbv	0.0286	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2,2,3-Trimethylpentane	ND	U	ppbv	0.0442	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
trans-1,3-Dichloropropene	ND	U	ppbv	0.0602	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,1,2-Trichloroethane	ND	U	ppbv	0.0404	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2,3,4-Trimethylpentane	ND	U	ppbv	0.0236	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Toluene	ND	U	ppbv	0.0308	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2-Hexanone	ND	U	ppbv	0.102	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2-Methylheptane	ND	U	ppbv	0.0346	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0154-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
1-Methylcyclohexene	ND	U	ppbv	0.107	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Chlorodibromomethane	ND	U	ppbv	0.0978	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
3-Methylheptane	ND	U	ppbv	0.0270	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Hexanal	ND	U	ppbv	0.117	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,2-Dibromoethane (EDB)	ND	U	ppbv	0.0400	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2,2,5-Trimethylhexane	ND	U	ppbv	0.0306	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1-Octene	ND	U	ppbv	0.100	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
n-Octane	ND	U	ppbv	0.0410	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Tetrachloroethene	ND	U	ppbv	0.0334	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
cis-2-Octene	ND	U	ppbv	0.105	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Chlorobenzene	ND	U	ppbv	0.0290	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Ethylbenzene	ND	U	ppbv	0.0560	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
m-Xylene & p-Xylene	ND	U	ppbv	0.123	0.800	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Bromoform	ND	U	ppbv	0.0582	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Butyl acrylate	ND	U	ppbv	0.179	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Heptanal	ND	U	ppbv	0.120	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Styrene	ND	U	ppbv	0.107	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,1,2,2-Tetrachloroethane	ND	U	ppbv	0.129	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
o-Xylene	ND	U	ppbv	0.0616	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Xylenes, total	ND	U	ppbv	0.183	1.20	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1-Nonene	ND	U	ppbv	0.0582	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
4-Nonene	ND	U	ppbv	0.331	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
n-Nonane	ND	U	ppbv	0.0570	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Isopropylbenzene	ND	U	ppbv	0.0516	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Benzaldehyde	ND	U	ppbv	0.100	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
alpha-Pinene	ND	U	ppbv	0.0500	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
2 & 3-Chlorotoluene	ND	U	ppbv	0.214	0.800	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
4-Chlorotoluene	ND	U	ppbv	0.108	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
n-Propylbenzene	ND	U	ppbv	0.0806	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
3-Ethyltoluene	ND	U	ppbv	0.0734	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
4-Ethyltoluene	ND	U	ppbv	0.0860	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,3,5-Trimethylbenzene	ND	U	ppbv	0.0658	0.400	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
1,2-Dichloroethene, Total	ND	U	ppbv	0.0860	0.800	2.00	11/19/12 13:27	GCMSR1	KDK	12K0154
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*100%*						11/19/12 13:27	GCMSR1	KDK	12K0154
Surr: Fluorobenzene (46-118%)	*94%*						11/19/12 13:27	GCMSR1	KDK	12K0154

Golder Associates Ltd.
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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0154-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Surr: Toluene-d8 (70-136%)	*104%*						11/19/12 13:27	GCMSR1	KDK	12K0154
Surr: 1,4-Dichlorobutane (38-135%)	*93%*						11/19/12 13:27	GCMSR1	KDK	12K0154
Surr: 4-Bromofluorobenzene (51-128%)	*91%*						11/19/12 13:27	GCMSR1	KDK	12K0154
Sample ID: 12K0167-BLK1 (Blank - Air)										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Halocarbon 134A	ND	**U**	ppbv	0.102	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Propylene	ND	**U**	ppbv	0.0550	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Chlorodifluoromethane	ND	**U**	ppbv	0.0350	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Propane	ND	**U**	ppbv	0.392	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Dichlorodifluoromethane	ND	**U**	ppbv	0.0468	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Chloromethane	ND	**U**	ppbv	0.0288	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Isobutane	ND	**U**	ppbv	0.0508	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	**U**	ppbv	0.147	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Acetaldehyde	ND	**U**	ppbv	0.0824	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Vinyl chloride	ND	**U**	ppbv	0.0580	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1-Butene/Isobutene	ND	**U**	ppbv	0.0454	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,3-Butadiene	ND	**U**	ppbv	0.0380	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Butane	ND	**U**	ppbv	0.0366	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Methanol	ND	**U**	ppbv	0.117	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
trans-2-Butene	ND	**U**	ppbv	0.0416	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Neopentane	ND	**U**	ppbv	0.0492	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Dichlorofluoromethane	ND	**U**	ppbv	0.0510	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Bromomethane	ND	**U**	ppbv	0.0634	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
cis-2-Butene	ND	**U**	ppbv	0.0350	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Chloroethane	ND	**U**	ppbv	0.0496	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Vinyl bromide	ND	**U**	ppbv	0.103	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
3-Methyl-1-butene	ND	**U**	ppbv	0.0444	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Ethanol	ND	**U**	ppbv	0.103	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Acetonitrile	ND	**U**	ppbv	0.104	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Isopentane	ND	**U**	ppbv	0.0208	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Trichlorofluoromethane	ND	**U**	ppbv	0.0284	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1-Pentene	ND	**U**	ppbv	0.0316	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Acetone	**0.0404**	**J**	ppbv	0.0296	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0167-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Isopropyl alcohol	ND	U	ppbv	0.0324	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Acrylonitrile	ND	U	ppbv	0.0512	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
n-Pentane	ND	U	ppbv	0.0268	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Diethyl ether	ND	U	ppbv	0.0318	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Isoprene	ND	U	ppbv	0.0462	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
trans-2-Pentene	ND	U	ppbv	0.0494	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,1-Dichloroethene	ND	U	ppbv	0.0240	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
cis-2-Pentene	ND	U	ppbv	0.0612	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Methylene chloride	ND	U	ppbv	0.0366	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2-Methyl-2-butene	ND	U	ppbv	0.0758	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Carbon disulfide	ND	U	ppbv	0.0898	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Allyl chloride	ND	U	ppbv	0.0610	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,1,2-Trichlorotrifluoroethane	ND	U	ppbv	0.0526	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2,2-Dimethylbutane	ND	U	ppbv	0.0462	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Cyclopentene	ND	U	ppbv	0.0510	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
trans-1,2-Dichloroethene	ND	U	ppbv	0.0514	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
4-Methyl-1-pentene	ND	U	ppbv	0.0382	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Propanol	ND	U	ppbv	0.114	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,1-Dichloroethane	ND	U	ppbv	0.0396	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Cyclopentane	ND	U	ppbv	0.0462	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2,3-Dimethylbutane	ND	U	ppbv	0.0392	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Methyl tert-Butyl Ether	ND	U	ppbv	0.0438	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Isohexane	ND	U	ppbv	0.0436	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Vinyl acetate	ND	U	ppbv	0.0784	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
cis/trans-4-Methyl-2-pentene	ND	U	ppbv	0.0472	0.800	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Butyraldehyde	ND	U	ppbv	0.0462	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2-Butanone (MEK)	ND	U	ppbv	0.0532	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Chloroprene	ND	U	ppbv	0.0398	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
3-Methylpentane	ND	U	ppbv	0.0468	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2-Methyl-1-pentene	ND	U	ppbv	0.0518	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1-Hexene	ND	U	ppbv	0.0374	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
cis-1,2-Dichloroethene	ND	U	ppbv	0.0362	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Bromochloromethane	ND	U	ppbv	0.0528	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2-Ethyl-1-butene	ND	U	ppbv	0.100	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Hexane	ND	U	ppbv	0.0438	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Chloroform	ND	U	ppbv	0.0330	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0167-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
cis-3-Hexene	ND	U	ppbv	0.103	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
trans-2-Hexene	ND	U	ppbv	0.0362	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2-Methyl-2-pentene	ND	U	ppbv	0.0268	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
cis-3-Methyl-2-pentene	ND	U	ppbv	0.0280	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
cis-2-Hexene	ND	U	ppbv	0.0396	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Methylcyclopentane	ND	U	ppbv	0.0392	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,2-Dichloroethane	ND	U	ppbv	0.0278	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2,4-Dimethylpentane	ND	U	ppbv	0.0366	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,1,1-Trichloroethane	ND	U	ppbv	0.0388	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1-Methylcyclopentene	ND	U	ppbv	0.00980	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Benzene	ND	U	ppbv	0.0418	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Carbon tetrachloride	ND	U	ppbv	0.109	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
n-Butanol	ND	U	ppbv	0.0998	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Cyclohexane	ND	U	ppbv	0.0496	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Isoheptane	ND	U	ppbv	0.0272	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2,3-Dimethylpentane	ND	U	ppbv	0.0330	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Cyclohexene	ND	U	ppbv	0.101	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
3-Methylhexane	ND	U	ppbv	0.0346	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,2-Dichloropropane	ND	U	ppbv	0.0318	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Bromodichloromethane	ND	U	ppbv	0.0938	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Trichloroethene	ND	U	ppbv	0.0270	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,4-Dioxane	ND	U	ppbv	0.0794	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1-Heptene	ND	U	ppbv	0.0456	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2,2,4-Trimethylpentane	ND	U	ppbv	0.0394	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
trans-3-Heptene	ND	U	ppbv	0.0600	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Heptane	ND	U	ppbv	0.0328	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
cis-3-Heptene	ND	U	ppbv	0.0780	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
trans-2-Heptene	ND	U	ppbv	0.103	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2,4,4-Trimethyl-1-pentene	ND	U	ppbv	0.102	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
cis-1,3-Dichloropropene	ND	U	ppbv	0.0422	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
4-Methyl-2-pentanone (MIBK)	ND	U	ppbv	0.0760	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Methylcyclohexane	ND	U	ppbv	0.0480	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2,4,4-Trimethyl-2-pentene	ND	U	ppbv	0.0408	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2,5-Dimethylhexane	ND	U	ppbv	0.0286	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2,2,3-Trimethylpentane	ND	U	ppbv	0.0442	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
trans-1,3-Dichloropropene	ND	U	ppbv	0.0602	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0167-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
1,1,2-Trichloroethane	ND	U	ppbv	0.0404	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2,3,4-Trimethylpentane	ND	U	ppbv	0.0236	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Toluene	ND	U	ppbv	0.0308	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2-Hexanone	ND	U	ppbv	0.102	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2-Methylheptane	ND	U	ppbv	0.0346	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1-Methylcyclohexene	ND	U	ppbv	0.107	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Chlorodibromomethane	ND	U	ppbv	0.0978	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
3-Methylheptane	ND	U	ppbv	0.0270	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Hexanal	ND	U	ppbv	0.117	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,2-Dibromoethane (EDB)	ND	U	ppbv	0.0400	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2,2,5-Trimethylhexane	ND	U	ppbv	0.0306	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1-Octene	ND	U	ppbv	0.100	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
n-Octane	ND	U	ppbv	0.0410	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Tetrachloroethene	ND	U	ppbv	0.0334	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
cis-2-Octene	ND	U	ppbv	0.105	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Chlorobenzene	ND	U	ppbv	0.0290	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Ethylbenzene	ND	U	ppbv	0.0560	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
m-Xylene & p-Xylene	ND	U	ppbv	0.123	0.800	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Bromoform	ND	U	ppbv	0.0582	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Butyl acrylate	ND	U	ppbv	0.179	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Heptanal	ND	U	ppbv	0.120	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Styrene	ND	U	ppbv	0.107	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,1,2,2-Tetrachloroethane	ND	U	ppbv	0.129	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
o-Xylene	ND	U	ppbv	0.0616	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Xylenes, total	ND	U	ppbv	0.183	1.20	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1-Nonene	ND	U	ppbv	0.0582	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
4-Nonene	ND	U	ppbv	0.331	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
n-Nonane	ND	U	ppbv	0.0570	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Isopropylbenzene	ND	U	ppbv	0.0516	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Benzaldehyde	ND	U	ppbv	0.100	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
alpha-Pinene	ND	U	ppbv	0.0500	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2 & 3-Chlorotoluene	ND	U	ppbv	0.214	0.800	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
4-Chlorotoluene	ND	U	ppbv	0.108	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
n-Propylbenzene	ND	U	ppbv	0.0806	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
3-Ethyltoluene	ND	U	ppbv	0.0734	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
4-Ethyltoluene	ND	U	ppbv	0.0860	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167

Golder Associates Ltd.
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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0167-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
1,3,5-Trimethylbenzene	ND	**U**	ppbv	0.0658	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
2-Ethyltoluene	ND	**U**	ppbv	0.0634	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
beta-Pinene	ND	**U**	ppbv	0.129	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,2,4-Trimethylbenzene	ND	**U**	ppbv	0.0738	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
tert-Butylbenzene	ND	**U**	ppbv	0.0314	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1-Decene	ND	**U**	ppbv	0.0980	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Benzyl chloride	ND	**U**	ppbv	0.110	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,3-Dichlorobenzene	ND	**U**	ppbv	0.105	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
n-Decane	ND	**U**	ppbv	0.0684	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,4-Dichlorobenzene	ND	**U**	ppbv	0.0854	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Isobutylbenzene	ND	**U**	ppbv	0.0650	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,2,3-Trimethylbenzene	ND	**U**	ppbv	0.0562	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
4-Isopropyltoluene	ND	**U**	ppbv	0.137	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,2-Dichlorobenzene	ND	**U**	ppbv	0.133	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Limonene	ND	**U**	ppbv	0.0498	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Indan	ND	**U**	ppbv	0.0912	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Indene	ND	**U**	ppbv	0.0572	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,3-Diethylbenzene	ND	**U**	ppbv	0.0978	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,4-Diethylbenzene	ND	**U**	ppbv	0.0998	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
n-Butylbenzene	ND	**U**	ppbv	0.0284	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1-Undecene	ND	**U**	ppbv	0.0550	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
n-Undecane	ND	**U**	ppbv	0.0502	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,2,4-Trichlorobenzene	**0.103**	**J**	ppbv	0.0464	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Naphthalene	ND	**U**	ppbv	0.0840	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Hexachlorobutadiene	ND	**U**	ppbv	0.0620	0.400	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
1,2-Dichloroethene, Total	ND	**U**	ppbv	0.0860	0.800	2.00	11/20/12 13:52	GCMSR1	KDK	12K0167
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*97%*						11/20/12 13:52	GCMSR1	KDK	12K0167
Surr: Fluorobenzene (46-118%)	*84%*						11/20/12 13:52	GCMSR1	KDK	12K0167
Surr: Toluene-d8 (70-136%)	*104%*						11/20/12 13:52	GCMSR1	KDK	12K0167
Surr: 1,4-Dichlorobutane (38-135%)	*92%*						11/20/12 13:52	GCMSR1	KDK	12K0167
Surr: 4-Bromofluorobenzene (51-128%)	*91%*						11/20/12 13:52	GCMSR1	KDK	12K0167
Sample ID: 12K0181-BLK1 (Blank - Air)										
EPA TO15 - Volatile Organic Compounds by GC/MS										

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0181-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Ethene	ND	U	ppbv	0.0357	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Acetylene	ND	U	ppbv	0.0569	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Ethane	ND	U	ppbv	0.0280	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Halocarbon 134A	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Propylene	ND	U	ppbv	0.0300	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Chlorodifluoromethane	ND	U	ppbv	0.0553	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Propane	ND	U	ppbv	0.0286	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Dichlorodifluoromethane	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Chloromethane	ND	U	ppbv	0.0241	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Isobutane	ND	U	ppbv	0.0301	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Acetaldehyde	ND	U	ppbv	0.103	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Vinyl chloride	ND	U	ppbv	0.0279	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1-Butene/Isobutene	ND	U	ppbv	0.0322	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,3-Butadiene	ND	U	ppbv	0.0260	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Butane	ND	U	ppbv	0.0260	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
trans-2-Butene	ND	U	ppbv	0.0270	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Neopentane	ND	U	ppbv	0.0311	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Dichlorofluoromethane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Bromomethane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
cis-2-Butene	ND	U	ppbv	0.0283	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Chloroethane	ND	U	ppbv	0.0211	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Vinyl bromide	ND	U	ppbv	0.0542	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
3-Methyl-1-butene	ND	U	ppbv	0.0252	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Acetonitrile	ND	U	ppbv	0.0338	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Isopentane	ND	U	ppbv	0.0555	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Trichlorofluoromethane	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1-Pentene	ND	U	ppbv	0.0268	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Acetone	**0.0676**	**J**	ppbv	0.0254	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Acrylonitrile	ND	U	ppbv	0.107	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
n-Pentane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Diethyl ether	ND	U	ppbv	0.0536	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Isoprene	ND	U	ppbv	0.0251	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
trans-2-Pentene	ND	U	ppbv	0.0359	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,1-Dichloroethene	ND	U	ppbv	0.0354	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
cis-2-Pentene	ND	U	ppbv	0.0275	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0181-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Methylene chloride	ND	U	ppbv	0.0300	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2-Methyl-2-butene	ND	U	ppbv	0.0234	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Carbon disulfide	ND	U	ppbv	0.101	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Allyl chloride	ND	U	ppbv	0.0292	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,1,2-Trichlorotrifluoroethane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2,2-Dimethylbutane	ND	U	ppbv	0.0278	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Cyclopentene	ND	U	ppbv	0.0233	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
trans-1,2-Dichloroethene	ND	U	ppbv	0.0574	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
4-Methyl-1-pentene	ND	U	ppbv	0.0215	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,1-Dichloroethane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Cyclopentane	ND	U	ppbv	0.0237	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2,3-Dimethylbutane	ND	U	ppbv	0.0206	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Methyl tert-Butyl Ether	ND	U	ppbv	0.0547	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Isohexane	ND	U	ppbv	0.0232	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Vinyl acetate	ND	U	ppbv	0.126	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
cis/trans-4-Methyl-2-pentene	ND	U	ppbv	0.0599	0.800	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Butyraldehyde	ND	U	ppbv	0.102	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2-Butanone (MEK)	ND	U	ppbv	0.0585	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Chloroprene	ND	U	ppbv	0.0211	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
3-Methylpentane	ND	U	ppbv	0.0255	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2-Methyl-1-pentene	ND	U	ppbv	0.0256	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1-Hexene	ND	U	ppbv	0.0538	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
cis-1,2-Dichloroethene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Bromochloromethane	ND	U	ppbv	0.0306	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2-Ethyl-1-butene	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Hexane	ND	U	ppbv	0.0268	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Chloroform	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
cis-3-Hexene	ND	U	ppbv	0.0303	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
trans-2-Hexene	ND	U	ppbv	0.0223	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2-Methyl-2-pentene	ND	U	ppbv	0.0288	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
cis-3-Methyl-2-pentene	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
cis-2-Hexene	ND	U	ppbv	0.0569	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Methylcyclopentane	ND	U	ppbv	0.0219	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,2-Dichloroethane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2,4-Dimethylpentane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,1,1-Trichloroethane	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181

Golder Associates Ltd.
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Julie Burghardt

Work Order: AVK0120
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Project Number: 08-1436-0106

Received: 11/15/12 08:30
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PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0181-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
1-Methylcyclopentene	ND	U	ppbv	0.0303	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Benzene	ND	U	ppbv	0.0224	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Carbon tetrachloride	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Cyclohexane	ND	U	ppbv	0.0217	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Isoheptane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2,3-Dimethylpentane	ND	U	ppbv	0.0300	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Cyclohexene	ND	U	ppbv	0.0136	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
3-Methylhexane	ND	U	ppbv	0.0250	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,2-Dichloropropane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Bromodichloromethane	ND	U	ppbv	0.0306	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Trichloroethene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1-Heptene	ND	U	ppbv	0.0547	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2,2,4-Trimethylpentane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
trans-3-Heptene	ND	U	ppbv	0.0291	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Heptane	ND	U	ppbv	0.0205	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
cis-3-Heptene	ND	U	ppbv	0.0124	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
trans-2-Heptene	ND	U	ppbv	0.0147	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2,4,4-Trimethyl-1-pentene	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
cis-1,3-Dichloropropene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
4-Methyl-2-pentanone (MIBK)	ND	U	ppbv	0.0580	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Methylcyclohexane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2,4,4-Trimethyl-2-pentene	ND	U	ppbv	0.0306	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2,5-Dimethylhexane	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2,2,3-Trimethylpentane	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
trans-1,3-Dichloropropene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,1,2-Trichloroethane	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2,3,4-Trimethylpentane	ND	U	ppbv	0.0205	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Toluene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2-Hexanone	**0.0208**	**J**	ppbv	0.0202	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2-Methylheptane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1-Methylcyclohexene	ND	U	ppbv	0.0306	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Chlorodibromomethane	ND	U	ppbv	0.0306	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
3-Methylheptane	ND	U	ppbv	0.0574	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Hexanal	ND	U	ppbv	0.0460	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,2-Dibromoethane (EDB)	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2,2,5-Trimethylhexane	ND	U	ppbv	0.0306	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0181-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
1-Octene	ND	U	ppbv	0.0154	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
n-Octane	ND	U	ppbv	0.0300	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Tetrachloroethene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
cis-2-Octene	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Chlorobenzene	ND	U	ppbv	0.0300	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Ethylbenzene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
m-Xylene & p-Xylene	ND	U	ppbv	0.0594	0.800	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Bromoform	ND	U	ppbv	0.0306	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Butyl acrylate	ND	U	ppbv	0.101	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Heptanal	ND	U	ppbv	0.101	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Styrene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,1,2,2-Tetrachloroethane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
o-Xylene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Xylenes, total	ND	U	ppbv	0.0441	1.20	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1-Nonene	ND	U	ppbv	0.0547	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
4-Nonene	ND	U	ppbv	0.0116	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
n-Nonane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Isopropylbenzene	ND	U	ppbv	0.0574	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Benzaldehyde	ND	U	ppbv	0.0319	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
alpha-Pinene	ND	U	ppbv	0.0300	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2 & 3-Chlorotoluene	ND	U	ppbv	0.0597	0.800	2.00	11/21/12 13:14	VMSC	KDK	12K0181
4-Chlorotoluene	ND	U	ppbv	0.0542	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
n-Propylbenzene	ND	U	ppbv	0.0300	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
3-Ethyltoluene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
4-Ethyltoluene	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,3,5-Trimethylbenzene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
2-Ethyltoluene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
beta-Pinene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,2,4-Trimethylbenzene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
tert-Butylbenzene	ND	U	ppbv	0.0306	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1-Decene	ND	U	ppbv	0.0547	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Benzyl chloride	ND	U	ppbv	0.106	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,3-Dichlorobenzene	ND	U	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
n-Decane	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,4-Dichlorobenzene	ND	U	ppbv	0.0297	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Isobutylbenzene	ND	U	ppbv	0.0306	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
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Received: 11/15/12 08:30
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PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0181-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
1,2,3-Trimethylbenzene	ND	**U**	ppbv	0.0580	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
4-Isopropyltoluene	ND	**U**	ppbv	0.0569	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,2-Dichlorobenzene	ND	**U**	ppbv	0.0294	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Limonene	ND	**U**	ppbv	0.0553	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Indan	ND	**U**	ppbv	0.0306	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Indene	ND	**U**	ppbv	0.0138	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,3-Diethylbenzene	ND	**U**	ppbv	0.0574	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,4-Diethylbenzene	ND	**U**	ppbv	0.0569	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
n-Butylbenzene	ND	**U**	ppbv	0.0148	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1-Undecene	ND	**U**	ppbv	0.0285	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
n-Undecane	ND	**U**	ppbv	0.0158	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,2,4-Trichlorobenzene	**0.106**	**J**	ppbv	0.0287	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Naphthalene	**0.136**	**J**	ppbv	0.0471	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Hexachlorobutadiene	ND	**U**	ppbv	0.0299	0.400	2.00	11/21/12 13:14	VMSC	KDK	12K0181
1,2-Dichloroethene, Total	ND	**U**	ppbv	0.0574	0.800	2.00	11/21/12 13:14	VMSC	KDK	12K0181
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*101%*						11/21/12 13:14	VMSC	KDK	12K0181
Surr: Fluorobenzene (46-118%)	*83%*						11/21/12 13:14	VMSC	KDK	12K0181
Surr: Toluene-d8 (70-136%)	*104%*						11/21/12 13:14	VMSC	KDK	12K0181
Surr: 1,4-Dichlorobutane (38-135%)	*88%*						11/21/12 13:14	VMSC	KDK	12K0181
Surr: 4-Bromofluorobenzene (51-128%)	*85%*						11/21/12 13:14	VMSC	KDK	12K0181
Sample ID: 12K0235-BLK1 (Blank - Air)										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Ethene	ND	**U**	ppbv	0.0357	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Acetylene	ND	**U**	ppbv	0.0569	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Ethane	ND	**U**	ppbv	0.0280	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Halocarbon 134A	ND	**U**	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Propylene	ND	**U**	ppbv	0.0300	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Chlorodifluoromethane	ND	**U**	ppbv	0.0553	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Propane	ND	**U**	ppbv	0.0286	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Dichlorodifluoromethane	ND	**U**	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Chloromethane	ND	**U**	ppbv	0.0241	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Isobutane	ND	**U**	ppbv	0.0301	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	**U**	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
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Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0235-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Acetaldehyde	**0.200**	**J**	ppbv	0.103	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Vinyl chloride	ND	**U**	ppbv	0.0279	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1-Butene/Isobutene	ND	**U**	ppbv	0.0322	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,3-Butadiene	ND	**U**	ppbv	0.0260	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Butane	ND	**U**	ppbv	0.0260	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
trans-2-Butene	ND	**U**	ppbv	0.0270	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Neopentane	ND	**U**	ppbv	0.0311	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Dichlorofluoromethane	ND	**U**	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Bromomethane	ND	**U**	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
cis-2-Butene	ND	**U**	ppbv	0.0283	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Chloroethane	ND	**U**	ppbv	0.0211	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Vinyl bromide	ND	**U**	ppbv	0.0542	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
3-Methyl-1-butene	ND	**U**	ppbv	0.0252	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Acetonitrile	ND	**U**	ppbv	0.0338	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Isopentane	ND	**U**	ppbv	0.0555	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Trichlorofluoromethane	ND	**U**	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1-Pentene	ND	**U**	ppbv	0.0268	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Acetone	**0.0988**	**J**	ppbv	0.0254	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Acrylonitrile	ND	**U**	ppbv	0.107	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
n-Pentane	ND	**U**	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Diethyl ether	ND	**U**	ppbv	0.0536	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Isoprene	ND	**U**	ppbv	0.0251	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
trans-2-Pentene	ND	**U**	ppbv	0.0359	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,1-Dichloroethene	ND	**U**	ppbv	0.0354	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
cis-2-Pentene	ND	**U**	ppbv	0.0275	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Methylene chloride	ND	**U**	ppbv	0.0300	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2-Methyl-2-butene	ND	**U**	ppbv	0.0234	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Carbon disulfide	ND	**U**	ppbv	0.101	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Allyl chloride	ND	**U**	ppbv	0.0292	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,1,2-Trichlorotrifluoroethane	ND	**U**	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2,2-Dimethylbutane	ND	**U**	ppbv	0.0278	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Cyclopentene	ND	**U**	ppbv	0.0233	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
trans-1,2-Dichloroethene	ND	**U**	ppbv	0.0574	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
4-Methyl-1-pentene	ND	**U**	ppbv	0.0215	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,1-Dichloroethane	ND	**U**	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Cyclopentane	ND	**U**	ppbv	0.0237	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0235-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
2,3-Dimethylbutane	ND	U	ppbv	0.0206	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Methyl tert-Butyl Ether	ND	U	ppbv	0.0547	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Isohexane	ND	U	ppbv	0.0232	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Vinyl acetate	ND	U	ppbv	0.126	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
cis/trans-4-Methyl-2-pentene	ND	U	ppbv	0.0599	0.800	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Butyraldehyde	ND	U	ppbv	0.102	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2-Butanone (MEK)	ND	U	ppbv	0.0585	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Chloroprene	ND	U	ppbv	0.0211	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
3-Methylpentane	ND	U	ppbv	0.0255	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2-Methyl-1-pentene	ND	U	ppbv	0.0256	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1-Hexene	ND	U	ppbv	0.0538	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
cis-1,2-Dichloroethene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Bromochloromethane	ND	U	ppbv	0.0306	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2-Ethyl-1-butene	ND	U	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Hexane	ND	U	ppbv	0.0268	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Chloroform	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
cis-3-Hexene	ND	U	ppbv	0.0303	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
trans-2-Hexene	ND	U	ppbv	0.0223	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2-Methyl-2-pentene	ND	U	ppbv	0.0288	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
cis-3-Methyl-2-pentene	ND	U	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
cis-2-Hexene	ND	U	ppbv	0.0569	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Methylcyclopentane	ND	U	ppbv	0.0219	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,2-Dichloroethane	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2,4-Dimethylpentane	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,1,1-Trichloroethane	ND	U	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1-Methylcyclopentene	ND	U	ppbv	0.0303	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Benzene	ND	U	ppbv	0.0224	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Carbon tetrachloride	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Cyclohexane	ND	U	ppbv	0.0217	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Isoheptane	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2,3-Dimethylpentane	ND	U	ppbv	0.0300	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Cyclohexene	ND	U	ppbv	0.0136	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
3-Methylhexane	ND	U	ppbv	0.0250	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,2-Dichloropropane	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Bromodichloromethane	ND	U	ppbv	0.0306	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Trichloroethene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0235-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
1-Heptene	ND	U	ppbv	0.0547	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2,2,4-Trimethylpentane	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
trans-3-Heptene	ND	U	ppbv	0.0291	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Heptane	ND	U	ppbv	0.0205	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
cis-3-Heptene	ND	U	ppbv	0.0124	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
trans-2-Heptene	ND	U	ppbv	0.0147	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2,4,4-Trimethyl-1-pentene	ND	U	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
cis-1,3-Dichloropropene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
4-Methyl-2-pentanone (MIBK)	ND	U	ppbv	0.0580	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Methylcyclohexane	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2,4,4-Trimethyl-2-pentene	ND	U	ppbv	0.0306	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2,5-Dimethylhexane	ND	U	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2,2,3-Trimethylpentane	ND	U	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
trans-1,3-Dichloropropene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,1,2-Trichloroethane	ND	U	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2,3,4-Trimethylpentane	ND	U	ppbv	0.0205	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Toluene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2-Hexanone	**0.181**	**J**	ppbv	0.0202	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2-Methylheptane	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1-Methylcyclohexene	ND	U	ppbv	0.0306	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Chlorodibromomethane	ND	U	ppbv	0.0306	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
3-Methylheptane	ND	U	ppbv	0.0574	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Hexanal	ND	U	ppbv	0.0460	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,2-Dibromoethane (EDB)	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2,2,5-Trimethylhexane	ND	U	ppbv	0.0306	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1-Octene	ND	U	ppbv	0.0154	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
n-Octane	ND	U	ppbv	0.0300	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Tetrachloroethene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
cis-2-Octene	ND	U	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Chlorobenzene	ND	U	ppbv	0.0300	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Ethylbenzene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
m-Xylene & p-Xylene	ND	U	ppbv	0.0594	0.800	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Bromoform	ND	U	ppbv	0.0306	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Butyl acrylate	ND	U	ppbv	0.101	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Heptanal	ND	U	ppbv	0.101	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Styrene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235

Golder Associates Ltd.
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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0235-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
1,1,2,2-Tetrachloroethane	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
o-Xylene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Xylenes, total	ND	U	ppbv	0.0441	1.20	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1-Nonene	ND	U	ppbv	0.0547	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
4-Nonene	ND	U	ppbv	0.0116	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
n-Nonane	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Isopropylbenzene	ND	U	ppbv	0.0574	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Benzaldehyde	ND	U	ppbv	0.0319	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
alpha-Pinene	ND	U	ppbv	0.0300	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2 & 3-Chlorotoluene	ND	U	ppbv	0.0597	0.800	2.00	11/30/12 14:18	VMSC	KRW	12K0235
4-Chlorotoluene	ND	U	ppbv	0.0542	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
n-Propylbenzene	ND	U	ppbv	0.0300	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
3-Ethyltoluene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
4-Ethyltoluene	ND	U	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,3,5-Trimethylbenzene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
2-Ethyltoluene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
beta-Pinene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,2,4-Trimethylbenzene	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
tert-Butylbenzene	ND	U	ppbv	0.0306	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1-Decene	ND	U	ppbv	0.0547	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Benzyl chloride	ND	U	ppbv	0.106	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,3-Dichlorobenzene	**0.0392**	**J**	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
n-Decane	ND	U	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,4-Dichlorobenzene	**0.0452**	**J**	ppbv	0.0297	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Isobutylbenzene	ND	U	ppbv	0.0306	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,2,3-Trimethylbenzene	ND	U	ppbv	0.0580	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
4-Isopropyltoluene	ND	U	ppbv	0.0569	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,2-Dichlorobenzene	**0.0550**	**J**	ppbv	0.0294	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Limonene	ND	U	ppbv	0.0553	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Indan	ND	U	ppbv	0.0306	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Indene	ND	U	ppbv	0.0138	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,3-Diethylbenzene	ND	U	ppbv	0.0574	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,4-Diethylbenzene	ND	U	ppbv	0.0569	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
n-Butylbenzene	**0.0214**	**J**	ppbv	0.0148	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1-Undecene	ND	U	ppbv	0.0285	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
n-Undecane	ND	U	ppbv	0.0158	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235

Golder Associates Ltd.
500-4260 Still Creek Drive
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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 12K0235-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
1,2,4-Trichlorobenzene	**0.118**	**J**	ppbv	0.0287	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Naphthalene	**0.180**	**J**	ppbv	0.0471	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Hexachlorobutadiene	ND	**U**	ppbv	0.0299	0.400	2.00	11/30/12 14:18	VMSC	KRW	12K0235
1,2-Dichloroethene, Total	ND	**U**	ppbv	0.0574	0.800	2.00	11/30/12 14:18	VMSC	KRW	12K0235
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*95%*						11/30/12 14:18	VMSC	KRW	12K0235
Surr: Fluorobenzene (46-118%)	*86%*						11/30/12 14:18	VMSC	KRW	12K0235
Surr: Toluene-d8 (70-136%)	*99%*						11/30/12 14:18	VMSC	KRW	12K0235
Surr: 1,4-Dichlorobutane (38-135%)	*88%*						11/30/12 14:18	VMSC	KRW	12K0235
Surr: 4-Bromofluorobenzene (51-128%)	*85%*						11/30/12 14:18	VMSC	KRW	12K0235

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PROJECT QUALITY CONTROL DATA

Calibration Check

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0154-CCV1 (Calibration Check - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Propylene	10.9		ppbv	0.400	2.00	11.1	98%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Propane	10.9		ppbv	0.400	2.00	10.9	100%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Dichlorodifluoromethane	10.3		ppbv	0.400	2.00	10.5	98%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Chloromethane	10.6		ppbv	0.400	2.00	10.7	100%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Isobutane	10.5		ppbv	0.400	2.00	10.9	97%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,2-Dichloro-1,1,2,2-tetrafluoroethane	10.4		ppbv	0.400	2.00	10.4	100%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Acetaldehyde	11.5		ppbv	0.400	2.00	10.9	106%	50 - 150	GCMSR1	11/19/12 10:14	12K0154
Vinyl chloride	10.5		ppbv	0.400	2.00	10.5	99%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1-Butene/Isobutene	10.7		ppbv	0.400	2.00	10.8	99%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,3-Butadiene	11.2		ppbv	0.400	2.00	11.2	100%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Butane	10.6		ppbv	0.400	2.00	10.8	98%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Methanol	11.4	B	ppbv	0.400	2.00	11.1	103%	50 - 150	GCMSR1	11/19/12 10:14	12K0154
trans-2-Butene	10.9		ppbv	0.400	2.00	10.7	102%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Bromomethane	10.7		ppbv	0.400	2.00	10.5	101%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
cis-2-Butene	11.9		ppbv	0.400	2.00	11.5	103%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Chloroethane	11.0		ppbv	0.400	2.00	10.5	104%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Vinyl bromide	11.8		ppbv	0.400	2.00	11.0	107%	50 - 150	GCMSR1	11/19/12 10:14	12K0154
3-Methyl-1-butene	12.2		ppbv	0.400	2.00	11.7	104%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Ethanol	11.9		ppbv	0.400	2.00	10.9	110%	50 - 150	GCMSR1	11/19/12 10:14	12K0154
Acetonitrile	12.1		ppbv	0.400	2.00	11.0	110%	50 - 150	GCMSR1	11/19/12 10:14	12K0154
Isopentane	10.9		ppbv	0.400	2.00	11.0	100%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Trichlorofluoromethane	11.1		ppbv	0.400	2.00	11.0	101%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1-Pentene	12.3		ppbv	0.400	2.00	11.5	107%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Acetone	12.6	B	ppbv	0.400	2.00	11.7	107%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Acrylonitrile	13.6		ppbv	0.400	2.00	11.2	122%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
n-Pentane	12.0		ppbv	0.400	2.00	11.4	105%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Isoprene	11.9		ppbv	0.400	2.00	11.2	106%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
trans-2-Pentene	12.5		ppbv	0.400	2.00	11.7	106%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,1-Dichloroethene	11.3		ppbv	0.400	2.00	11.1	102%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
cis-2-Pentene	12.3		ppbv	0.400	2.00	11.5	107%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Methylene chloride	11.6		ppbv	0.400	2.00	10.9	107%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
2-Methyl-2-butene	12.7		ppbv	0.400	2.00	11.8	108%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Carbon disulfide	11.7		ppbv	0.400	2.00	11.0	107%	50 - 150	GCMSR1	11/19/12 10:14	12K0154
Allyl chloride	11.3		ppbv	0.400	2.00	11.3	101%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,1,2-Trichlorotrifluoroethane	11.5		ppbv	0.400	2.00	11.0	105%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
2,2-Dimethylbutane	11.8		ppbv	0.400	2.00	11.3	105%	70 - 130	GCMSR1	11/19/12 10:14	12K0154

Golder Associates Ltd.
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PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0154-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Cyclopentene	11.9		ppbv	0.400	2.00	11.1	108%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
trans-1,2-Dichloroethene	11.0		ppbv	0.400	2.00	11.1	99%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
4-Methyl-1-pentene	11.8		ppbv	0.400	2.00	11.4	104%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,1-Dichloroethane	11.9		ppbv	0.400	2.00	11.3	105%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Cyclopentane	11.3		ppbv	0.400	2.00	11.3	100%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
2,3-Dimethylbutane	10.7		ppbv	0.400	2.00	11.2	96%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Methyl tert-Butyl Ether	11.6		ppbv	0.400	2.00	10.9	107%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Isohexane	11.6		ppbv	0.400	2.00	11.5	101%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Vinyl acetate	13.5		ppbv	0.400	2.00	11.7	115%	50 - 150	GCMSR1	11/19/12 10:14	12K0154
2-Butanone (MEK)	11.4		ppbv	0.400	2.00	11.6	98%	50 - 150	GCMSR1	11/19/12 10:14	12K0154
Chloroprene	10.9		ppbv	0.400	2.00	10.8	101%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
3-Methylpentane	11.6		ppbv	0.400	2.00	11.5	101%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
2-Methyl-1-pentene	11.8		ppbv	0.400	2.00	11.3	104%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1-Hexene	12.0		ppbv	0.400	2.00	10.8	112%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
cis-1,2-Dichloroethene	11.4		ppbv	0.400	2.00	11.2	102%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Bromochloromethane	11.3		ppbv	0.400	2.00	10.9	104%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Hexane	11.9		ppbv	0.400	2.00	11.7	102%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Chloroform	11.6		ppbv	0.400	2.00	11.1	104%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
trans-2-Hexene	12.3		ppbv	0.400	2.00	11.6	106%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
cis-2-Hexene	11.2		ppbv	0.400	2.00	10.8	104%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Methylcyclopentane	11.0		ppbv	0.400	2.00	11.2	99%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,2-Dichloroethane	12.3		ppbv	0.400	2.00	11.3	109%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
2,4-Dimethylpentane	11.7		ppbv	0.400	2.00	11.4	102%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,1,1-Trichloroethane	11.8		ppbv	0.400	2.00	11.3	104%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Benzene	12.3		ppbv	0.400	2.00	11.4	108%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Carbon tetrachloride	12.5		ppbv	0.400	2.00	11.2	112%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
n-Butanol	9.68		ppbv	0.400	2.00	10.3	94%	50 - 150	GCMSR1	11/19/12 10:14	12K0154
Cyclohexane	11.1		ppbv	0.400	2.00	11.7	95%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Isoheptane	11.4		ppbv	0.400	2.00	11.3	101%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
2,3-Dimethylpentane	11.3		ppbv	0.400	2.00	11.3	100%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
3-Methylhexane	11.3		ppbv	0.400	2.00	11.3	100%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,2-Dichloropropane	12.7		ppbv	0.400	2.00	11.3	113%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Bromodichloromethane	11.8		ppbv	0.400	2.00	10.8	110%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Trichloroethene	10.9		ppbv	0.400	2.00	10.8	102%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,4-Dioxane	12.2		ppbv	0.400	2.00	11.1	110%	50 - 150	GCMSR1	11/19/12 10:14	12K0154
2,2,4-Trimethylpentane	11.4		ppbv	0.400	2.00	11.3	101%	70 - 130	GCMSR1	11/19/12 10:14	12K0154

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0154-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Heptane	11.7		ppbv	0.400	2.00	11.4	102%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
cis-1,3-Dichloropropene	12.5		ppbv	0.400	2.00	11.1	113%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
4-Methyl-2-pentanone (MIBK)	11.1		ppbv	0.400	2.00	11.6	96%	50 - 150	GCMSR1	11/19/12 10:14	12K0154
Methylcyclohexane	11.4		ppbv	0.400	2.00	11.4	100%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
trans-1,3-Dichloropropene	13.6		ppbv	0.400	2.00	11.7	116%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,1,2-Trichloroethane	13.1		ppbv	0.400	2.00	11.4	115%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
2,3,4-Trimethylpentane	11.5		ppbv	0.400	2.00	11.5	100%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Toluene	13.3		ppbv	0.400	2.00	11.6	115%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
2-Methylheptane	12.1		ppbv	0.400	2.00	11.4	106%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Chlorodibromomethane	13.8		ppbv	0.400	2.00	11.1	125%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
3-Methylheptane	11.7		ppbv	0.400	2.00	11.4	103%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,2-Dibromoethane (EDB)	13.5		ppbv	0.400	2.00	11.5	118%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
n-Octane	12.5		ppbv	0.400	2.00	11.4	110%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Tetrachloroethene	12.3		ppbv	0.400	2.00	11.3	109%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Chlorobenzene	13.7		ppbv	0.400	2.00	11.5	119%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Ethylbenzene	13.9		ppbv	0.400	2.00	11.5	121%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
m-Xylene & p-Xylene	28.0		ppbv	0.800	2.00	22.6	124%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Bromoform	**15.8**	**C8**	**ppbv**	**0.400**	**2.00**	**11.3**	**140%**	**70 - 130**	**GCMSR1**	**11/19/12 10:14**	**12K0154**
Styrene	14.4		ppbv	0.400	2.00	11.6	124%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,1,2,2-Tetrachloroethane	14.1		ppbv	0.400	2.00	11.4	123%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
o-Xylene	13.9		ppbv	0.400	2.00	11.4	122%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Xylenes, total	41.8		ppbv	1.20	2.00	34.0	123%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
n-Nonane	13.1		ppbv	0.400	2.00	11.2	117%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Isopropylbenzene	12.9		ppbv	0.400	2.00	10.9	119%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
alpha-Pinene	12.1		ppbv	0.400	2.00	11.2	108%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
n-Propylbenzene	13.5		ppbv	0.400	2.00	11.0	123%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
3-Ethyltoluene	13.0		ppbv	0.400	2.00	10.7	122%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
4-Ethyltoluene	13.4		ppbv	0.400	2.00	10.8	124%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,3,5-Trimethylbenzene	13.7		ppbv	0.400	2.00	11.6	118%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
1,2-Dichloroethene, Total	22.4		ppbv	0.800	2.00	22.3	101%	70 - 130	GCMSR1	11/19/12 10:14	12K0154
Surr: 2-Bromo-1,1,1-trifluoroethane (70-130%)	*101%*								GCMSR1	11/19/12 10:14	12K0154
Surr: Fluorobenzene (70-130%)	*101%*								GCMSR1	11/19/12 10:14	12K0154
Surr: Toluene-d8 (70-130%)	*98%*								GCMSR1	11/19/12 10:14	12K0154
Surr: 1,4-Dichlorobutane (70-130%)	*105%*								GCMSR1	11/19/12 10:14	12K0154
Surr: 4-Bromofluorobenzene (70-130%)	*104%*								GCMSR1	11/19/12 10:14	12K0154

Golder Associates Ltd.
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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0167-CCV1 (Calibration Check - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Propylene	10.6		ppbv	0.400	2.00	11.1	95%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Propane	10.7		ppbv	0.400	2.00	10.9	98%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Dichlorodifluoromethane	9.80		ppbv	0.400	2.00	10.5	93%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Chloromethane	10.3		ppbv	0.400	2.00	10.7	97%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Isobutane	10.2		ppbv	0.400	2.00	10.9	94%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,2-Dichloro-1,1,2,2-tetrafluoroethane	9.76		ppbv	0.400	2.00	10.4	94%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Acetaldehyde	10.7		ppbv	0.400	2.00	10.9	99%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
Vinyl chloride	9.95		ppbv	0.400	2.00	10.5	94%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1-Butene/Isobutene	10.3		ppbv	0.400	2.00	10.8	96%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,3-Butadiene	10.9		ppbv	0.400	2.00	11.2	98%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Butane	10.2		ppbv	0.400	2.00	10.8	95%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Methanol	10.8		ppbv	0.400	2.00	11.1	98%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
trans-2-Butene	10.5		ppbv	0.400	2.00	10.7	99%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Bromomethane	9.91		ppbv	0.400	2.00	10.5	94%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
cis-2-Butene	11.5		ppbv	0.400	2.00	11.5	100%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Chloroethane	10.4		ppbv	0.400	2.00	10.5	98%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Vinyl bromide	11.0		ppbv	0.400	2.00	11.0	101%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
3-Methyl-1-butene	11.7		ppbv	0.400	2.00	11.7	99%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Ethanol	10.7		ppbv	0.400	2.00	10.9	99%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
Acetonitrile	12.0		ppbv	0.400	2.00	11.0	109%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
Isopentane	10.7		ppbv	0.400	2.00	11.0	97%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Trichlorofluoromethane	10.5		ppbv	0.400	2.00	11.0	96%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1-Pentene	11.8		ppbv	0.400	2.00	11.5	102%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Acetone	12.1	B	ppbv	0.400	2.00	11.7	103%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Acrylonitrile	13.2		ppbv	0.400	2.00	11.2	118%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
n-Pentane	11.3		ppbv	0.400	2.00	11.4	99%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Isoprene	10.9		ppbv	0.400	2.00	11.2	98%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
trans-2-Pentene	11.8		ppbv	0.400	2.00	11.7	101%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,1-Dichloroethene	10.8		ppbv	0.400	2.00	11.1	97%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
cis-2-Pentene	11.5		ppbv	0.400	2.00	11.5	100%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Methylene chloride	11.2		ppbv	0.400	2.00	10.9	103%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
2-Methyl-2-butene	11.9		ppbv	0.400	2.00	11.8	101%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Carbon disulfide	11.2		ppbv	0.400	2.00	11.0	102%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
Allyl chloride	10.9		ppbv	0.400	2.00	11.3	97%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,1,2-Trichlorotrifluoroethane	10.9		ppbv	0.400	2.00	11.0	99%	70 - 130	GCMSR1	11/20/12 10:39	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0167-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
2,2-Dimethylbutane	11.6		ppbv	0.400	2.00	11.3	103%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Cyclopentene	10.2		ppbv	0.400	2.00	11.1	92%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
trans-1,2-Dichloroethene	10.3		ppbv	0.400	2.00	11.1	93%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
4-Methyl-1-pentene	11.2		ppbv	0.400	2.00	11.4	98%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,1-Dichloroethane	10.7		ppbv	0.400	2.00	11.3	95%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Cyclopentane	10.6		ppbv	0.400	2.00	11.3	94%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
2,3-Dimethylbutane	10.3		ppbv	0.400	2.00	11.2	93%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Methyl tert-Butyl Ether	11.0		ppbv	0.400	2.00	10.9	101%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Isohexane	11.0		ppbv	0.400	2.00	11.5	96%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Vinyl acetate	12.2		ppbv	0.400	2.00	11.7	104%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
2-Butanone (MEK)	10.9		ppbv	0.400	2.00	11.6	94%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
Chloroprene	9.84		ppbv	0.400	2.00	10.8	91%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
3-Methylpentane	10.9		ppbv	0.400	2.00	11.5	94%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
2-Methyl-1-pentene	10.1		ppbv	0.400	2.00	11.3	90%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1-Hexene	10.3		ppbv	0.400	2.00	10.8	95%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
cis-1,2-Dichloroethene	10.5		ppbv	0.400	2.00	11.2	94%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Bromochloromethane	10.3		ppbv	0.400	2.00	10.9	94%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Hexane	10.6		ppbv	0.400	2.00	11.7	90%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Chloroform	10.2		ppbv	0.400	2.00	11.1	92%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
trans-2-Hexene	10.6		ppbv	0.400	2.00	11.6	92%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
cis-2-Hexene	9.76		ppbv	0.400	2.00	10.8	91%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Methylcyclopentane	10.2		ppbv	0.400	2.00	11.2	91%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,2-Dichloroethane	10.8		ppbv	0.400	2.00	11.3	96%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
2,4-Dimethylpentane	11.3		ppbv	0.400	2.00	11.4	99%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,1,1-Trichloroethane	10.8		ppbv	0.400	2.00	11.3	96%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Benzene	13.2		ppbv	0.400	2.00	11.4	116%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Carbon tetrachloride	**14.6**	**C8**	**ppbv**	**0.400**	**2.00**	**11.2**	**131%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
n-Butanol	13.2		ppbv	0.400	2.00	10.3	128%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
Cyclohexane	13.1		ppbv	0.400	2.00	11.7	112%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Isoheptane	13.9		ppbv	0.400	2.00	11.3	123%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
2,3-Dimethylpentane	13.4		ppbv	0.400	2.00	11.3	119%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
3-Methylhexane	13.6		ppbv	0.400	2.00	11.3	120%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,2-Dichloropropane	13.9		ppbv	0.400	2.00	11.3	123%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Bromodichloromethane	12.3		ppbv	0.400	2.00	10.8	115%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Trichloroethene	11.4		ppbv	0.400	2.00	10.8	106%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,4-Dioxane	13.7		ppbv	0.400	2.00	11.1	124%	50 - 150	GCMSR1	11/20/12 10:39	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0167-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
2,2,4-Trimethylpentane	13.7		ppbv	0.400	2.00	11.3	121%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Heptane	12.9		ppbv	0.400	2.00	11.4	113%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
cis-1,3-Dichloropropene	12.5		ppbv	0.400	2.00	11.1	113%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
4-Methyl-2-pentanone (MIBK)	13.7		ppbv	0.400	2.00	11.6	118%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
Methylcyclohexane	13.4		ppbv	0.400	2.00	11.4	117%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
trans-1,3-Dichloropropene	13.7		ppbv	0.400	2.00	11.7	117%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,1,2-Trichloroethane	12.9		ppbv	0.400	2.00	11.4	113%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
2,3,4-Trimethylpentane	14.1		ppbv	0.400	2.00	11.5	122%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Toluene	13.5		ppbv	0.400	2.00	11.6	116%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
2-Methylheptane	14.7		ppbv	0.400	2.00	11.4	129%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Chlorodibromomethane	13.5		ppbv	0.400	2.00	11.1	122%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
3-Methylheptane	13.8		ppbv	0.400	2.00	11.4	121%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,2-Dibromoethane (EDB)	13.0		ppbv	0.400	2.00	11.5	113%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
n-Octane	14.4		ppbv	0.400	2.00	11.4	126%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Tetrachloroethene	12.2		ppbv	0.400	2.00	11.3	108%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Chlorobenzene	13.0		ppbv	0.400	2.00	11.5	113%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Ethylbenzene	13.8		ppbv	0.400	2.00	11.5	120%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
m-Xylene & p-Xylene	28.3		ppbv	0.800	2.00	22.6	126%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Bromoform	**14.9**	**C8**	**ppbv**	**0.400**	**2.00**	**11.3**	**132%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
Styrene	13.8		ppbv	0.400	2.00	11.6	119%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,1,2,2-Tetrachloroethane	**15.6**	**C8**	**ppbv**	**0.400**	**2.00**	**11.4**	**136%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
o-Xylene	**15.0**	**C8**	**ppbv**	**0.400**	**2.00**	**11.4**	**132%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
Xylenes, total	43.4		ppbv	1.20	2.00	34.0	128%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
n-Nonane	**15.0**	**C8**	**ppbv**	**0.400**	**2.00**	**11.2**	**134%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
Isopropylbenzene	**14.4**	**C8**	**ppbv**	**0.400**	**2.00**	**10.9**	**133%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
alpha-Pinene	14.4		ppbv	0.400	2.00	11.2	129%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
n-Propylbenzene	**14.4**	**C8**	**ppbv**	**0.400**	**2.00**	**11.0**	**131%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
3-Ethyltoluene	13.9	C8	ppbv	0.400	2.00	10.7	130%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
4-Ethyltoluene	**14.1**	**C8**	**ppbv**	**0.400**	**2.00**	**10.8**	**131%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
1,3,5-Trimethylbenzene	**15.3**	**C8**	**ppbv**	**0.400**	**2.00**	**11.6**	**132%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
2-Ethyltoluene	**13.9**	**C8**	**ppbv**	**0.400**	**2.00**	**10.5**	**132%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
beta-Pinene	**10.4**	**C8**	**ppbv**	**0.400**	**2.00**	**7.99**	**131%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
1,2,4-Trimethylbenzene	**15.2**	**C8**	**ppbv**	**0.400**	**2.00**	**11.6**	**131%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
Benzyl chloride	**17.1**	**C8**	**ppbv**	**0.400**	**2.00**	**11.6**	**148%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
1,3-Dichlorobenzene	14.4		ppbv	0.400	2.00	11.6	124%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
n-Decane	**15.5**	**C8**	**ppbv**	**0.400**	**2.00**	**11.4**	**136%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0167-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
1,4-Dichlorobenzene	14.2		ppbv	0.400	2.00	11.5	123%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,2,3-Trimethylbenzene	13.6		ppbv	0.400	2.00	10.4	130%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
1,2-Dichlorobenzene	14.2		ppbv	0.400	2.00	11.5	123%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Limonene	13.9		ppbv	0.400	2.00	11.2	124%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
Indan	14.2		ppbv	0.400	2.00	11.2	127%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
Indene	13.6		ppbv	0.400	2.00	11.0	124%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
1,3-Diethylbenzene	**14.2**	**C8**	**ppbv**	**0.400**	**2.00**	**10.3**	**138%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
1,4-Diethylbenzene	**14.6**	**C8**	**ppbv**	**0.400**	**2.00**	**10.5**	**139%**	**70 - 130**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
n-Undecane	14.0		ppbv	0.400	2.00	10.9	129%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
1,2,4-Trichlorobenzene	16.2	B	ppbv	0.400	2.00	11.6	139%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
Naphthalene	**17.5**	**C8**	**ppbv**	**0.400**	**2.00**	**11.6**	**151%**	**50 - 150**	**GCMSR1**	**11/20/12 10:39**	**12K0167**
Hexachlorobutadiene	15.9		ppbv	0.400	2.00	11.5	138%	50 - 150	GCMSR1	11/20/12 10:39	12K0167
1,2-Dichloroethene, Total	20.7		ppbv	0.800	2.00	22.3	93%	70 - 130	GCMSR1	11/20/12 10:39	12K0167
Surr: 2-Bromo-1,1,1-trifluoroethane (70-130%)	*98%*								GCMSR1	11/20/12 10:39	12K0167
Surr: Fluorobenzene (70-130%)	*88%*								GCMSR1	11/20/12 10:39	12K0167
Surr: Toluene-d8 (70-130%)	*105%*								GCMSR1	11/20/12 10:39	12K0167
Surr: 1,4-Dichlorobutane (70-130%)	*113%*								GCMSR1	11/20/12 10:39	12K0167
Surr: 4-Bromofluorobenzene (70-130%)	*106%*								GCMSR1	11/20/12 10:39	12K0167
Sample ID: 12K0181-CCV1 (Calibration Check - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Ethene	9.55		ppbv	0.400	2.00	11.3	84%	70 - 130	VMSC	11/21/12 09:59	12K0181
Acetylene	7.48	C4	ppbv	0.400	2.00	11.3	66%	70 - 130	VMSC	11/21/12 09:59	12K0181
Ethane	8.98		ppbv	0.400	2.00	11.3	79%	50 - 150	VMSC	11/21/12 09:59	12K0181
Propylene	9.89		ppbv	0.400	2.00	11.1	89%	70 - 130	VMSC	11/21/12 09:59	12K0181
Propane	10.0		ppbv	0.400	2.00	10.9	92%	70 - 130	VMSC	11/21/12 09:59	12K0181
Dichlorodifluoromethane	9.03		ppbv	0.400	2.00	10.6	85%	70 - 130	VMSC	11/21/12 09:59	12K0181
Chloromethane	9.80		ppbv	0.400	2.00	10.7	92%	70 - 130	VMSC	11/21/12 09:59	12K0181
Isobutane	9.70		ppbv	0.400	2.00	10.9	89%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,2-Dichloro-1,1,2,2-tetrafluoroethane	8.66		ppbv	0.400	2.00	10.5	83%	70 - 130	VMSC	11/21/12 09:59	12K0181
Acetaldehyde	9.60		ppbv	0.400	2.00	10.9	88%	50 - 150	VMSC	11/21/12 09:59	12K0181
Vinyl chloride	8.55		ppbv	0.400	2.00	10.6	81%	70 - 130	VMSC	11/21/12 09:59	12K0181
1-Butene/Isobutene	10.2		ppbv	0.400	2.00	10.8	94%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,3-Butadiene	10.8		ppbv	0.400	2.00	11.2	96%	70 - 130	VMSC	11/21/12 09:59	12K0181

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0181-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Butane	9.81		ppbv	0.400	2.00	10.8	91%	70 - 130	VMSC	11/21/12 09:59	12K0181
trans-2-Butene	11.0		ppbv	0.400	2.00	10.7	103%	70 - 130	VMSC	11/21/12 09:59	12K0181
Bromomethane	9.42		ppbv	0.400	2.00	10.6	89%	70 - 130	VMSC	11/21/12 09:59	12K0181
cis-2-Butene	12.1		ppbv	0.400	2.00	11.5	105%	70 - 130	VMSC	11/21/12 09:59	12K0181
Chloroethane	10.1		ppbv	0.400	2.00	10.6	96%	70 - 130	VMSC	11/21/12 09:59	12K0181
Vinyl bromide	11.5		ppbv	0.400	2.00	11.0	104%	50 - 150	VMSC	11/21/12 09:59	12K0181
3-Methyl-1-butene	11.5		ppbv	0.400	2.00	11.8	97%	70 - 130	VMSC	11/21/12 09:59	12K0181
Acetonitrile	8.86		ppbv	0.400	2.00	11.0	81%	50 - 150	VMSC	11/21/12 09:59	12K0181
Isopentane	10.3		ppbv	0.400	2.00	11.0	93%	70 - 130	VMSC	11/21/12 09:59	12K0181
Trichlorofluoromethane	10.7		ppbv	0.400	2.00	11.0	97%	70 - 130	VMSC	11/21/12 09:59	12K0181
1-Pentene	11.8		ppbv	0.400	2.00	11.5	102%	70 - 130	VMSC	11/21/12 09:59	12K0181
Acetone	10.5	B	ppbv	0.400	2.00	11.8	89%	70 - 130	VMSC	11/21/12 09:59	12K0181
Acrylonitrile	12.0		ppbv	0.400	2.00	11.2	107%	70 - 130	VMSC	11/21/12 09:59	12K0181
n-Pentane	11.8		ppbv	0.400	2.00	11.4	103%	70 - 130	VMSC	11/21/12 09:59	12K0181
Isoprene	9.57		ppbv	0.400	2.00	11.2	85%	70 - 130	VMSC	11/21/12 09:59	12K0181
trans-2-Pentene	11.5		ppbv	0.400	2.00	11.8	98%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,1-Dichloroethene	11.1		ppbv	0.400	2.00	11.1	100%	70 - 130	VMSC	11/21/12 09:59	12K0181
cis-2-Pentene	11.3		ppbv	0.400	2.00	11.5	98%	70 - 130	VMSC	11/21/12 09:59	12K0181
Methylene chloride	11.8		ppbv	0.400	2.00	10.9	108%	70 - 130	VMSC	11/21/12 09:59	12K0181
2-Methyl-2-butene	11.7		ppbv	0.400	2.00	11.9	99%	70 - 130	VMSC	11/21/12 09:59	12K0181
Carbon disulfide	10.8		ppbv	0.400	2.00	11.0	98%	50 - 150	VMSC	11/21/12 09:59	12K0181
Allyl chloride	10.6		ppbv	0.400	2.00	11.3	93%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,1,2-Trichlorotrifluoroethane	10.6		ppbv	0.400	2.00	11.0	96%	70 - 130	VMSC	11/21/12 09:59	12K0181
2,2-Dimethylbutane	10.7		ppbv	0.400	2.00	11.3	95%	70 - 130	VMSC	11/21/12 09:59	12K0181
Cyclopentene	9.53		ppbv	0.400	2.00	11.1	86%	70 - 130	VMSC	11/21/12 09:59	12K0181
trans-1,2-Dichloroethene	10.7		ppbv	0.400	2.00	11.1	96%	70 - 130	VMSC	11/21/12 09:59	12K0181
4-Methyl-1-pentene	11.9		ppbv	0.400	2.00	11.4	104%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,1-Dichloroethane	10.8		ppbv	0.400	2.00	11.3	95%	70 - 130	VMSC	11/21/12 09:59	12K0181
Cyclopentane	11.5		ppbv	0.400	2.00	11.3	101%	70 - 130	VMSC	11/21/12 09:59	12K0181
2,3-Dimethylbutane	10.8		ppbv	0.400	2.00	11.2	96%	70 - 130	VMSC	11/21/12 09:59	12K0181
Methyl tert-Butyl Ether	8.85		ppbv	0.400	2.00	10.9	81%	70 - 130	VMSC	11/21/12 09:59	12K0181
Isohexane	11.8		ppbv	0.400	2.00	11.5	102%	70 - 130	VMSC	11/21/12 09:59	12K0181
Vinyl acetate	14.3		ppbv	0.400	2.00	11.8	122%	50 - 150	VMSC	11/21/12 09:59	12K0181
2-Butanone (MEK)	9.37		ppbv	0.400	2.00	11.6	81%	50 - 150	VMSC	11/21/12 09:59	12K0181
Chloroprene	11.1		ppbv	0.400	2.00	10.8	103%	70 - 130	VMSC	11/21/12 09:59	12K0181
3-Methylpentane	11.1		ppbv	0.400	2.00	11.5	96%	70 - 130	VMSC	11/21/12 09:59	12K0181

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0181-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
2-Methyl-1-pentene	11.3		ppbv	0.400	2.00	11.3	100%	70 - 130	VMSC	11/21/12 09:59	12K0181
1-Hexene	11.4		ppbv	0.400	2.00	10.8	105%	70 - 130	VMSC	11/21/12 09:59	12K0181
cis-1,2-Dichloroethene	10.5		ppbv	0.400	2.00	11.2	94%	70 - 130	VMSC	11/21/12 09:59	12K0181
Bromochloromethane	10.5		ppbv	0.400	2.00	10.9	96%	70 - 130	VMSC	11/21/12 09:59	12K0181
Hexane	11.0		ppbv	0.400	2.00	11.8	94%	70 - 130	VMSC	11/21/12 09:59	12K0181
Chloroform	10.2		ppbv	0.400	2.00	11.1	92%	70 - 130	VMSC	11/21/12 09:59	12K0181
trans-2-Hexene	11.3		ppbv	0.400	2.00	11.6	97%	70 - 130	VMSC	11/21/12 09:59	12K0181
cis-2-Hexene	10.3		ppbv	0.400	2.00	10.8	96%	70 - 130	VMSC	11/21/12 09:59	12K0181
Methylcyclopentane	10.5		ppbv	0.400	2.00	11.2	94%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,2-Dichloroethane	11.4		ppbv	0.400	2.00	11.3	101%	70 - 130	VMSC	11/21/12 09:59	12K0181
2,4-Dimethylpentane	12.3		ppbv	0.400	2.00	11.4	108%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,1,1-Trichloroethane	11.9		ppbv	0.400	2.00	11.3	105%	70 - 130	VMSC	11/21/12 09:59	12K0181
Benzene	10.4		ppbv	0.400	2.00	11.4	91%	70 - 130	VMSC	11/21/12 09:59	12K0181
Carbon tetrachloride	**16.8**	**C8**	**ppbv**	**0.400**	**2.00**	**11.2**	**150%**	**70 - 130**	**VMSC**	**11/21/12 09:59**	**12K0181**
Cyclohexane	12.6		ppbv	0.400	2.00	11.8	107%	70 - 130	VMSC	11/21/12 09:59	12K0181
Isoheptane	13.1		ppbv	0.400	2.00	11.3	116%	70 - 130	VMSC	11/21/12 09:59	12K0181
2,3-Dimethylpentane	13.1		ppbv	0.400	2.00	11.3	116%	70 - 130	VMSC	11/21/12 09:59	12K0181
3-Methylhexane	13.0		ppbv	0.400	2.00	11.3	115%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,2-Dichloropropane	10.9		ppbv	0.400	2.00	11.3	97%	70 - 130	VMSC	11/21/12 09:59	12K0181
Bromodichloromethane	11.7		ppbv	0.400	2.00	10.8	108%	70 - 130	VMSC	11/21/12 09:59	12K0181
Trichloroethene	11.5		ppbv	0.400	2.00	10.8	106%	70 - 130	VMSC	11/21/12 09:59	12K0181
2,2,4-Trimethylpentane	13.4		ppbv	0.400	2.00	11.3	118%	70 - 130	VMSC	11/21/12 09:59	12K0181
Heptane	10.3		ppbv	0.400	2.00	11.4	90%	70 - 130	VMSC	11/21/12 09:59	12K0181
cis-1,3-Dichloropropene	10.6		ppbv	0.400	2.00	11.1	96%	70 - 130	VMSC	11/21/12 09:59	12K0181
4-Methyl-2-pentanone (MIBK)	13.1		ppbv	0.400	2.00	11.6	112%	50 - 150	VMSC	11/21/12 09:59	12K0181
Methylcyclohexane	11.7		ppbv	0.400	2.00	11.4	103%	70 - 130	VMSC	11/21/12 09:59	12K0181
trans-1,3-Dichloropropene	11.9		ppbv	0.400	2.00	11.8	101%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,1,2-Trichloroethane	10.6		ppbv	0.400	2.00	11.4	93%	70 - 130	VMSC	11/21/12 09:59	12K0181
2,3,4-Trimethylpentane	13.9		ppbv	0.400	2.00	11.5	121%	70 - 130	VMSC	11/21/12 09:59	12K0181
Toluene	10.6		ppbv	0.400	2.00	11.6	91%	70 - 130	VMSC	11/21/12 09:59	12K0181
2-Methylheptane	12.7		ppbv	0.400	2.00	11.4	111%	70 - 130	VMSC	11/21/12 09:59	12K0181
Chlorodibromomethane	13.8		ppbv	0.400	2.00	11.1	124%	70 - 130	VMSC	11/21/12 09:59	12K0181
3-Methylheptane	11.1		ppbv	0.400	2.00	11.4	97%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,2-Dibromoethane (EDB)	11.5		ppbv	0.400	2.00	11.5	100%	70 - 130	VMSC	11/21/12 09:59	12K0181
n-Octane	11.9		ppbv	0.400	2.00	11.4	104%	70 - 130	VMSC	11/21/12 09:59	12K0181
Tetrachloroethene	11.2		ppbv	0.400	2.00	11.3	99%	70 - 130	VMSC	11/21/12 09:59	12K0181

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0181-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Chlorobenzene	10.8		ppbv	0.400	2.00	11.5	93%	70 - 130	VMSC	11/21/12 09:59	12K0181
Ethylbenzene	10.1		ppbv	0.400	2.00	11.5	88%	70 - 130	VMSC	11/21/12 09:59	12K0181
m-Xylene & p-Xylene	20.8		ppbv	0.800	2.00	22.6	92%	70 - 130	VMSC	11/21/12 09:59	12K0181
Bromoform	**18.8**	**C8**	**ppbv**	**0.400**	**2.00**	**11.3**	**166%**	**70 - 130**	**VMSC**	**11/21/12 09:59**	**12K0181**
Styrene	10.2		ppbv	0.400	2.00	11.6	88%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,1,2,2-Tetrachloroethane	11.2		ppbv	0.400	2.00	11.4	98%	70 - 130	VMSC	11/21/12 09:59	12K0181
o-Xylene	10.8		ppbv	0.400	2.00	11.4	95%	70 - 130	VMSC	11/21/12 09:59	12K0181
Xylenes, total	31.6		ppbv	1.20	2.00	34.1	93%	70 - 130	VMSC	11/21/12 09:59	12K0181
n-Nonane	12.7		ppbv	0.400	2.00	11.2	113%	70 - 130	VMSC	11/21/12 09:59	12K0181
Isopropylbenzene	11.0		ppbv	0.400	2.00	10.9	101%	70 - 130	VMSC	11/21/12 09:59	12K0181
alpha-Pinene	11.8		ppbv	0.400	2.00	11.2	105%	70 - 130	VMSC	11/21/12 09:59	12K0181
n-Propylbenzene	10.8		ppbv	0.400	2.00	11.0	98%	70 - 130	VMSC	11/21/12 09:59	12K0181
3-Ethyltoluene	12.9		ppbv	0.400	2.00	10.7	121%	70 - 130	VMSC	11/21/12 09:59	12K0181
4-Ethyltoluene	12.9		ppbv	0.400	2.00	10.8	119%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,3,5-Trimethylbenzene	12.9		ppbv	0.400	2.00	11.6	111%	70 - 130	VMSC	11/21/12 09:59	12K0181
2-Ethyltoluene	11.6		ppbv	0.400	2.00	10.6	110%	70 - 130	VMSC	11/21/12 09:59	12K0181
beta-Pinene	8.25		ppbv	0.400	2.00	8.01	103%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,2,4-Trimethylbenzene	14.8		ppbv	0.400	2.00	11.6	127%	70 - 130	VMSC	11/21/12 09:59	12K0181
Benzyl chloride	**21.5**	**C8**	**ppbv**	**0.400**	**2.00**	**11.6**	**185%**	**70 - 130**	**VMSC**	**11/21/12 09:59**	**12K0181**
1,3-Dichlorobenzene	11.7		ppbv	0.400	2.00	11.6	101%	70 - 130	VMSC	11/21/12 09:59	12K0181
n-Decane	**15.7**	**C8**	**ppbv**	**0.400**	**2.00**	**11.4**	**138%**	**70 - 130**	**VMSC**	**11/21/12 09:59**	**12K0181**
1,4-Dichlorobenzene	12.5		ppbv	0.400	2.00	11.5	108%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,2,3-Trimethylbenzene	13.5		ppbv	0.400	2.00	10.5	128%	70 - 130	VMSC	11/21/12 09:59	12K0181
1,2-Dichlorobenzene	12.7		ppbv	0.400	2.00	11.5	110%	70 - 130	VMSC	11/21/12 09:59	12K0181
Limonene	12.4		ppbv	0.400	2.00	11.2	111%	50 - 150	VMSC	11/21/12 09:59	12K0181
Indan	13.5		ppbv	0.400	2.00	11.2	121%	50 - 150	VMSC	11/21/12 09:59	12K0181
Indene	12.2		ppbv	0.400	2.00	11.0	111%	50 - 150	VMSC	11/21/12 09:59	12K0181
1,3-Diethylbenzene	**14.1**	**C8**	**ppbv**	**0.400**	**2.00**	**10.4**	**136%**	**70 - 130**	**VMSC**	**11/21/12 09:59**	**12K0181**
1,4-Diethylbenzene	**14.7**	**C8**	**ppbv**	**0.400**	**2.00**	**10.6**	**139%**	**70 - 130**	**VMSC**	**11/21/12 09:59**	**12K0181**
n-Undecane	13.8		ppbv	0.400	2.00	10.9	127%	50 - 150	VMSC	11/21/12 09:59	12K0181
1,2,4-Trichlorobenzene	16.7	B	ppbv	0.400	2.00	11.6	143%	50 - 150	VMSC	11/21/12 09:59	12K0181
Naphthalene	14.5	B	ppbv	0.400	2.00	11.6	125%	50 - 150	VMSC	11/21/12 09:59	12K0181
Hexachlorobutadiene	15.0		ppbv	0.400	2.00	11.5	130%	50 - 150	VMSC	11/21/12 09:59	12K0181
1,2-Dichloroethene, Total	21.2		ppbv	0.800	2.00	22.3	95%	70 - 130	VMSC	11/21/12 09:59	12K0181
Surr: 2-Bromo-1,1,1-trifluoroethane (70-130%)	*102%*								VMSC	11/21/12 9:59	12K0181

Golder Associates Ltd.
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Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0181-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Surr: Fluorobenzene (70-130%)	*97%*								VMSC	11/21/12 9:59	12K0181
Surr: Toluene-d8 (70-130%)	*104%*								VMSC	11/21/12 9:59	12K0181
Surr: 1,4-Dichlorobutane (70-130%)	*103%*								VMSC	11/21/12 9:59	12K0181
Surr: 4-Bromofluorobenzene (70-130%)	*95%*								VMSC	11/21/12 9:59	12K0181
Sample ID: 12K0235-CCV1 (Calibration Check - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Ethene	9.19		ppbv	0.800	4.00	11.1	83%	70 - 130	VMSC	11/30/12 11:26	12K0235
Acetylene	9.29		ppbv	0.800	4.00	11.1	84%	70 - 130	VMSC	11/30/12 11:26	12K0235
Ethane	8.84		ppbv	0.800	4.00	11.1	80%	50 - 150	VMSC	11/30/12 11:26	12K0235
Propylene	9.65		ppbv	0.800	4.00	10.9	89%	70 - 130	VMSC	11/30/12 11:26	12K0235
Propane	9.99		ppbv	0.800	4.00	10.7	93%	70 - 130	VMSC	11/30/12 11:26	12K0235
Dichlorodifluoromethane	8.90		ppbv	0.800	4.00	10.4	86%	70 - 130	VMSC	11/30/12 11:26	12K0235
Chloromethane	9.76		ppbv	0.800	4.00	10.5	93%	70 - 130	VMSC	11/30/12 11:26	12K0235
Isobutane	9.63		ppbv	0.800	4.00	10.7	90%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,2-Dichloro-1,1,2,2-tetrafluoroethane	8.62		ppbv	0.800	4.00	10.3	84%	70 - 130	VMSC	11/30/12 11:26	12K0235
Acetaldehyde	9.32	B	ppbv	0.800	4.00	10.6	88%	50 - 150	VMSC	11/30/12 11:26	12K0235
Vinyl chloride	8.35		ppbv	0.800	4.00	10.4	80%	70 - 130	VMSC	11/30/12 11:26	12K0235
1-Butene/Isobutene	10.1		ppbv	0.800	4.00	10.6	95%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,3-Butadiene	10.6		ppbv	0.800	4.00	11.0	96%	70 - 130	VMSC	11/30/12 11:26	12K0235
Butane	9.80		ppbv	0.800	4.00	10.6	93%	70 - 130	VMSC	11/30/12 11:26	12K0235
trans-2-Butene	10.5		ppbv	0.800	4.00	10.5	100%	70 - 130	VMSC	11/30/12 11:26	12K0235
Bromomethane	9.23		ppbv	0.800	4.00	10.4	89%	70 - 130	VMSC	11/30/12 11:26	12K0235
cis-2-Butene	11.4		ppbv	0.800	4.00	11.3	101%	70 - 130	VMSC	11/30/12 11:26	12K0235
Chloroethane	8.70		ppbv	0.800	4.00	10.4	84%	70 - 130	VMSC	11/30/12 11:26	12K0235
Vinyl bromide	10.8		ppbv	0.800	4.00	10.8	100%	50 - 150	VMSC	11/30/12 11:26	12K0235
3-Methyl-1-butene	10.7		ppbv	0.800	4.00	11.5	93%	70 - 130	VMSC	11/30/12 11:26	12K0235
Acetonitrile	9.62		ppbv	0.800	4.00	10.6	91%	50 - 150	VMSC	11/30/12 11:26	12K0235
Isopentane	10.1		ppbv	0.800	4.00	10.8	94%	70 - 130	VMSC	11/30/12 11:26	12K0235
Trichlorofluoromethane	10.5		ppbv	0.800	4.00	10.8	97%	70 - 130	VMSC	11/30/12 11:26	12K0235
1-Pentene	10.0		ppbv	0.800	4.00	11.3	89%	70 - 130	VMSC	11/30/12 11:26	12K0235
Acetone	9.29	B	ppbv	0.800	4.00	11.2	83%	70 - 130	VMSC	11/30/12 11:26	12K0235
Acrylonitrile	9.29		ppbv	0.800	4.00	10.9	85%	70 - 130	VMSC	11/30/12 11:26	12K0235
n-Pentane	11.1		ppbv	0.800	4.00	11.2	99%	70 - 130	VMSC	11/30/12 11:26	12K0235

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0235-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Isoprene	7.83		ppbv	0.800	4.00	11.0	71%	70 - 130	VMSC	11/30/12 11:26	12K0235
trans-2-Pentene	9.38		ppbv	0.800	4.00	11.5	81%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,1-Dichloroethene	10.0		ppbv	0.800	4.00	10.9	92%	70 - 130	VMSC	11/30/12 11:26	12K0235
cis-2-Pentene	9.26		ppbv	0.800	4.00	11.3	82%	70 - 130	VMSC	11/30/12 11:26	12K0235
Methylene chloride	9.82		ppbv	0.800	4.00	10.7	92%	70 - 130	VMSC	11/30/12 11:26	12K0235
2-Methyl-2-butene	9.47		ppbv	0.800	4.00	11.6	81%	70 - 130	VMSC	11/30/12 11:26	12K0235
Carbon disulfide	10.4		ppbv	0.800	4.00	10.7	97%	50 - 150	VMSC	11/30/12 11:26	12K0235
Allyl chloride	10.2		ppbv	0.800	4.00	11.1	91%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,1,2-Trichlorotrifluoroethane	10.3		ppbv	0.800	4.00	10.8	96%	70 - 130	VMSC	11/30/12 11:26	12K0235
2,2-Dimethylbutane	10.4		ppbv	0.800	4.00	11.1	93%	70 - 130	VMSC	11/30/12 11:26	12K0235
Cyclopentene	7.92		ppbv	0.800	4.00	10.9	73%	70 - 130	VMSC	11/30/12 11:26	12K0235
trans-1,2-Dichloroethene	8.83		ppbv	0.800	4.00	10.9	81%	70 - 130	VMSC	11/30/12 11:26	12K0235
4-Methyl-1-pentene	9.86		ppbv	0.800	4.00	11.2	88%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,1-Dichloroethane	8.61		ppbv	0.800	4.00	11.1	77%	70 - 130	VMSC	11/30/12 11:26	12K0235
Cyclopentane	10.7		ppbv	0.800	4.00	11.1	96%	70 - 130	VMSC	11/30/12 11:26	12K0235
2,3-Dimethylbutane	10.0		ppbv	0.800	4.00	11.0	91%	70 - 130	VMSC	11/30/12 11:26	12K0235
Methyl tert-Butyl Ether	7.92		ppbv	0.800	4.00	10.7	74%	70 - 130	VMSC	11/30/12 11:26	12K0235
Isohexane	10.1		ppbv	0.800	4.00	11.3	90%	70 - 130	VMSC	11/30/12 11:26	12K0235
Vinyl acetate	11.2		ppbv	0.800	4.00	11.5	97%	50 - 150	VMSC	11/30/12 11:26	12K0235
2-Butanone (MEK)	7.75		ppbv	0.800	4.00	11.2	69%	50 - 150	VMSC	11/30/12 11:26	12K0235
Chloroprene	8.85		ppbv	0.800	4.00	10.6	84%	70 - 130	VMSC	11/30/12 11:26	12K0235
3-Methylpentane	9.54		ppbv	0.800	4.00	11.3	84%	70 - 130	VMSC	11/30/12 11:26	12K0235
2-Methyl-1-pentene	8.48		ppbv	0.800	4.00	11.1	76%	70 - 130	VMSC	11/30/12 11:26	12K0235
1-Hexene	8.26		ppbv	0.800	4.00	10.6	78%	70 - 130	VMSC	11/30/12 11:26	12K0235
cis-1,2-Dichloroethene	8.47		ppbv	0.800	4.00	11.0	77%	70 - 130	VMSC	11/30/12 11:26	12K0235
Bromochloromethane	8.66		ppbv	0.800	4.00	10.7	81%	70 - 130	VMSC	11/30/12 11:26	12K0235
Hexane	8.94		ppbv	0.800	4.00	11.5	78%	70 - 130	VMSC	11/30/12 11:26	12K0235
Chloroform	8.32		ppbv	0.800	4.00	10.9	76%	70 - 130	VMSC	11/30/12 11:26	12K0235
trans-2-Hexene	8.80		ppbv	0.800	4.00	11.4	77%	70 - 130	VMSC	11/30/12 11:26	12K0235
cis-2-Hexene	8.10		ppbv	0.800	4.00	10.6	77%	70 - 130	VMSC	11/30/12 11:26	12K0235
Methylcyclopentane	8.75		ppbv	0.800	4.00	11.0	80%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,2-Dichloroethane	9.11		ppbv	0.800	4.00	11.1	82%	70 - 130	VMSC	11/30/12 11:26	12K0235
2,4-Dimethylpentane	9.91		ppbv	0.800	4.00	11.2	88%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,1,1-Trichloroethane	9.87		ppbv	0.800	4.00	11.1	89%	70 - 130	VMSC	11/30/12 11:26	12K0235
Benzene	7.76	C4	ppbv	0.800	4.00	11.2	69%	70 - 130	VMSC	11/30/12 11:26	12K0235
Carbon tetrachloride	13.4		ppbv	0.800	4.00	11.0	122%	70 - 130	VMSC	11/30/12 11:26	12K0235

Golder Associates Ltd.
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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0235-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Cyclohexane	9.92		ppbv	0.800	4.00	11.5	86%	70 - 130	VMSC	11/30/12 11:26	12K0235
Isoheptane	9.47		ppbv	0.800	4.00	11.1	85%	70 - 130	VMSC	11/30/12 11:26	12K0235
2,3-Dimethylpentane	9.45		ppbv	0.800	4.00	11.1	85%	70 - 130	VMSC	11/30/12 11:26	12K0235
3-Methylhexane	9.31		ppbv	0.800	4.00	11.1	84%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,2-Dichloropropane	8.15		ppbv	0.800	4.00	11.1	73%	70 - 130	VMSC	11/30/12 11:26	12K0235
Bromodichloromethane	8.81		ppbv	0.800	4.00	10.6	83%	70 - 130	VMSC	11/30/12 11:26	12K0235
Trichloroethene	8.73		ppbv	0.800	4.00	10.6	82%	70 - 130	VMSC	11/30/12 11:26	12K0235
2,2,4-Trimethylpentane	9.45		ppbv	0.800	4.00	11.1	85%	70 - 130	VMSC	11/30/12 11:26	12K0235
Heptane	7.53	C4	ppbv	0.800	4.00	11.2	67%	70 - 130	VMSC	11/30/12 11:26	12K0235
cis-1,3-Dichloropropene	7.54	C4	ppbv	0.800	4.00	10.9	69%	70 - 130	VMSC	11/30/12 11:26	12K0235
4-Methyl-2-pentanone (MIBK)	9.60		ppbv	0.800	4.00	10.8	89%	50 - 150	VMSC	11/30/12 11:26	12K0235
Methylcyclohexane	8.45		ppbv	0.800	4.00	11.2	75%	70 - 130	VMSC	11/30/12 11:26	12K0235
trans-1,3-Dichloropropene	8.33		ppbv	0.800	4.00	11.5	72%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,1,2-Trichloroethane	8.26		ppbv	0.800	4.00	11.2	74%	70 - 130	VMSC	11/30/12 11:26	12K0235
2,3,4-Trimethylpentane	9.75		ppbv	0.800	4.00	11.3	86%	70 - 130	VMSC	11/30/12 11:26	12K0235
Toluene	8.15		ppbv	0.800	4.00	11.4	71%	70 - 130	VMSC	11/30/12 11:26	12K0235
2-Methylheptane	9.24		ppbv	0.800	4.00	11.2	82%	70 - 130	VMSC	11/30/12 11:26	12K0235
Chlorodibromomethane	11.0		ppbv	0.800	4.00	10.9	101%	70 - 130	VMSC	11/30/12 11:26	12K0235
3-Methylheptane	8.00		ppbv	0.800	4.00	11.2	71%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,2-Dibromoethane (EDB)	8.67		ppbv	0.800	4.00	11.3	77%	70 - 130	VMSC	11/30/12 11:26	12K0235
n-Octane	8.74		ppbv	0.800	4.00	11.2	78%	70 - 130	VMSC	11/30/12 11:26	12K0235
Tetrachloroethene	9.07		ppbv	0.800	4.00	11.1	82%	70 - 130	VMSC	11/30/12 11:26	12K0235
Chlorobenzene	8.46		ppbv	0.800	4.00	11.3	75%	70 - 130	VMSC	11/30/12 11:26	12K0235
Ethylbenzene	7.54	C4	ppbv	0.800	4.00	11.3	67%	70 - 130	VMSC	11/30/12 11:26	12K0235
m-Xylene & p-Xylene	15.7		ppbv	1.60	4.00	22.2	71%	70 - 130	VMSC	11/30/12 11:26	12K0235
Bromoform	**16.4**	**C8**	**ppbv**	**0.800**	**4.00**	**11.1**	**147%**	**70 - 130**	**VMSC**	**11/30/12 11:26**	**12K0235**
Styrene	7.20	C4	ppbv	0.800	4.00	11.4	63%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,1,2,2-Tetrachloroethane	8.11		ppbv	0.800	4.00	11.2	72%	70 - 130	VMSC	11/30/12 11:26	12K0235
o-Xylene	8.09		ppbv	0.800	4.00	11.2	72%	70 - 130	VMSC	11/30/12 11:26	12K0235
Xylenes, total	23.8		ppbv	2.40	4.00	33.4	71%	70 - 130	VMSC	11/30/12 11:26	12K0235
n-Nonane	8.46		ppbv	0.800	4.00	11.0	77%	70 - 130	VMSC	11/30/12 11:26	12K0235
Isopropylbenzene	7.79		ppbv	0.800	4.00	10.7	73%	70 - 130	VMSC	11/30/12 11:26	12K0235
alpha-Pinene	8.13		ppbv	0.800	4.00	11.0	74%	70 - 130	VMSC	11/30/12 11:26	12K0235
n-Propylbenzene	7.10	C4	ppbv	0.800	4.00	10.8	66%	70 - 130	VMSC	11/30/12 11:26	12K0235
3-Ethyltoluene	8.32		ppbv	0.800	4.00	10.5	79%	70 - 130	VMSC	11/30/12 11:26	12K0235
4-Ethyltoluene	8.51		ppbv	0.800	4.00	10.6	80%	70 - 130	VMSC	11/30/12 11:26	12K0235

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0235-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
1,3,5-Trimethylbenzene	8.51		ppbv	0.800	4.00	11.4	75%	70 - 130	VMSC	11/30/12 11:26	12K0235
2-Ethyltoluene	7.73		ppbv	0.800	4.00	10.4	74%	70 - 130	VMSC	11/30/12 11:26	12K0235
beta-Pinene	5.56	C4	ppbv	0.800	4.00	8.38	66%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,2,4-Trimethylbenzene	9.41		ppbv	0.800	4.00	11.4	82%	70 - 130	VMSC	11/30/12 11:26	12K0235
Benzyl chloride	14.1		ppbv	0.800	4.00	11.4	123%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,3-Dichlorobenzene	8.28	B	ppbv	0.800	4.00	11.4	72%	70 - 130	VMSC	11/30/12 11:26	12K0235
n-Decane	9.40		ppbv	0.800	4.00	11.2	84%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,4-Dichlorobenzene	8.65	B	ppbv	0.800	4.00	11.3	76%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,2,3-Trimethylbenzene	8.53		ppbv	0.800	4.00	10.3	83%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,2-Dichlorobenzene	8.69	B	ppbv	0.800	4.00	11.3	77%	70 - 130	VMSC	11/30/12 11:26	12K0235
Limonene	7.53		ppbv	0.800	4.00	11.0	68%	50 - 150	VMSC	11/30/12 11:26	12K0235
Indan	8.61		ppbv	0.800	4.00	11.0	78%	50 - 150	VMSC	11/30/12 11:26	12K0235
Indene	7.49		ppbv	0.800	4.00	10.9	69%	50 - 150	VMSC	11/30/12 11:26	12K0235
1,3-Diethylbenzene	8.50		ppbv	0.800	4.00	10.2	84%	70 - 130	VMSC	11/30/12 11:26	12K0235
1,4-Diethylbenzene	8.70		ppbv	0.800	4.00	10.4	84%	70 - 130	VMSC	11/30/12 11:26	12K0235
n-Undecane	7.78		ppbv	0.800	4.00	10.4	75%	50 - 150	VMSC	11/30/12 11:26	12K0235
1,2,4-Trichlorobenzene	10.8	B	ppbv	0.800	4.00	11.4	94%	50 - 150	VMSC	11/30/12 11:26	12K0235
Naphthalene	9.07	B	ppbv	0.800	4.00	10.5	87%	50 - 150	VMSC	11/30/12 11:26	12K0235
Hexachlorobutadiene	9.81		ppbv	0.800	4.00	11.3	87%	50 - 150	VMSC	11/30/12 11:26	12K0235
1,2-Dichloroethene, Total	17.3		ppbv	1.60	4.00	21.9	79%	70 - 130	VMSC	11/30/12 11:26	12K0235
Surr: 2-Bromo-1,1,1-trifluoroethane (70-130%)	*102%*								VMSC	11/30/12 11:26	12K0235
Surr: Fluorobenzene (70-130%)	*100%*								VMSC	11/30/12 11:26	12K0235
Surr: Toluene-d8 (70-130%)	*102%*								VMSC	11/30/12 11:26	12K0235
Surr: 1,4-Dichlorobutane (70-130%)	*95%*								VMSC	11/30/12 11:26	12K0235
Surr: 4-Bromofluorobenzene (70-130%)	*89%*								VMSC	11/30/12 11:26	12K0235

Golder Associates Ltd.
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Julie Burghardt

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Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Duplicate

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0154-DUP1 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Chloromethane	**0.514**	**J**	**0.533**	ppbv	4	25	12K0154	AVK0119-01	11/19/12 20:25
Vinyl chloride	ND	**U**	ND	ppbv		25	12K0154	AVK0119-01	11/19/12 20:25
1,3-Butadiene	ND	**U**	ND	ppbv		25	12K0154	AVK0119-01	11/19/12 20:25
Acetonitrile	ND	**U**	ND	ppbv		25	12K0154	AVK0119-01	11/19/12 20:25
Acrylonitrile	ND	**U**	ND	ppbv		25	12K0154	AVK0119-01	11/19/12 20:25
Methylene chloride	**ND**	**J**	**0.0676**	ppbv		25	12K0154	AVK0119-01	11/19/12 20:25
Chloroform	ND	**U**	ND	ppbv		25	12K0154	AVK0119-01	11/19/12 20:25
1,2-Dichloroethane	ND	**U**	ND	ppbv		25	12K0154	AVK0119-01	11/19/12 20:25
Benzene	**0.197**	**J**	**0.183**	ppbv	8	25	12K0154	AVK0119-01	11/19/12 20:25
Toluene	**0.267**	**J**	**0.286**	ppbv	7	25	12K0154	AVK0119-01	11/19/12 20:25
Tetrachloroethene	ND	**U**	ND	ppbv		25	12K0154	AVK0119-01	11/19/12 20:25
Styrene	ND	**U**	ND	ppbv		25	12K0154	AVK0119-01	11/19/12 20:25
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*98%*						12K0154		11/19/12 20:25
Surr: Fluorobenzene (46-118%)	*86%*						12K0154		11/19/12 20:25
Surr: Toluene-d8 (70-136%)	*109%*						12K0154		11/19/12 20:25
Surr: 1,4-Dichlorobutane (38-135%)	*95%*						12K0154		11/19/12 20:25
Surr: 4-Bromofluorobenzene (51-128%)	*88%*						12K0154		11/19/12 20:25
Sample ID: 12K0154-DUP2 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Chloromethane	**0.511**	**J**	**0.525**	ppbv	3	25	12K0154	AVK0119-02	11/19/12 22:24
Vinyl chloride	ND	**U**	ND	ppbv		25	12K0154	AVK0119-02	11/19/12 22:24
1,3-Butadiene	ND	**U**	ND	ppbv		25	12K0154	AVK0119-02	11/19/12 22:24
Acetonitrile	ND	**U**	ND	ppbv		25	12K0154	AVK0119-02	11/19/12 22:24
Acrylonitrile	ND	**U**	ND	ppbv		25	12K0154	AVK0119-02	11/19/12 22:24
Methylene chloride	**0.0950**	**J**	**0.0946**	ppbv	0.4	25	12K0154	AVK0119-02	11/19/12 22:24
Chloroform	ND	**U**	ND	ppbv		25	12K0154	AVK0119-02	11/19/12 22:24
1,2-Dichloroethane	ND	**U**	ND	ppbv		25	12K0154	AVK0119-02	11/19/12 22:24
Benzene	**0.464**	**J**	**0.466**	ppbv	0.4	25	12K0154	AVK0119-02	11/19/12 22:24
Toluene	**2.67**		**2.75**	ppbv	3	25	12K0154	AVK0119-02	11/19/12 22:24
Tetrachloroethene	ND	**U**	ND	ppbv		25	12K0154	AVK0119-02	11/19/12 22:24
Styrene	**0.263**	**J**	**0.301**	ppbv	13	25	12K0154	AVK0119-02	11/19/12 22:24

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Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0154-DUP2 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*98%*						12K0154		11/19/12 22:24
Surr: Fluorobenzene (46-118%)	*85%*						12K0154		11/19/12 22:24
Surr: Toluene-d8 (70-136%)	*108%*						12K0154		11/19/12 22:24
Surr: 1,4-Dichlorobutane (38-135%)	*94%*						12K0154		11/19/12 22:24
Surr: 4-Bromofluorobenzene (51-128%)	*90%*						12K0154		11/19/12 22:24
Sample ID: 12K0167-DUP1 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Methanol	**6.00**		**6.15**	ppbv	3	50	12K0167	AVK0090-07RE1	11/20/12 21:51
Ethanol	**2.74**		**2.87**	ppbv	5	25	12K0167	AVK0090-07RE1	11/20/12 21:51
Isopropyl alcohol	**1.10**		**1.12**	ppbv	3	50	12K0167	AVK0090-07RE1	11/20/12 21:51
Propanol	ND	**U**	ND	ppbv		25	12K0167	AVK0090-07RE1	11/20/12 21:51
n-Butanol	ND	**U**	ND	ppbv		50	12K0167	AVK0090-07RE1	11/20/12 21:51
1,4-Dioxane	ND	**U**	ND	ppbv		50	12K0167	AVK0090-07RE1	11/20/12 21:51
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*95%*						12K0167		11/20/12 21:51
Surr: Fluorobenzene (46-118%)	*85%*						12K0167		11/20/12 21:51
Surr: Toluene-d8 (70-136%)	*104%*						12K0167		11/20/12 21:51
Surr: 1,4-Dichlorobutane (38-135%)	*95%*						12K0167		11/20/12 21:51
Surr: 4-Bromofluorobenzene (51-128%)	*88%*						12K0167		11/20/12 21:51
Sample ID: 12K0167-DUP2 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Methanol	**7.97**		**7.90**	ppbv	0.8	50	12K0167	AVK0090-08RE1	11/20/12 23:50
Ethanol	**2.34**		**2.39**	ppbv	3	25	12K0167	AVK0090-08RE1	11/20/12 23:50
Isopropyl alcohol	**1.25**		**1.28**	ppbv	3	50	12K0167	AVK0090-08RE1	11/20/12 23:50
Propanol	ND	**R4, U**	ND	ppbv		25	12K0167	AVK0090-08RE1	11/20/12 23:50
n-Butanol	**0.731**	**J**	**0.723**	ppbv	1	50	12K0167	AVK0090-08RE1	11/20/12 23:50
1,4-Dioxane	ND	**R4, U**	ND	ppbv		50	12K0167	AVK0090-08RE1	11/20/12 23:50
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*96%*						12K0167		11/20/12 23:50
Surr: Fluorobenzene (46-118%)	*83%*						12K0167		11/20/12 23:50

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Received: 11/15/12 08:30
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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0167-DUP2 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Surr: Toluene-d8 (70-136%)	*104%*						12K0167		11/20/12 23:50
Surr: 1,4-Dichlorobutane (38-135%)	*96%*						12K0167		11/20/12 23:50
Surr: 4-Bromofluorobenzene (51-128%)	*90%*						12K0167		11/20/12 23:50
Sample ID: 12K0181-DUP1 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Ethene	**0.240**	**J**	**0.237**	ppbv	1	25	12K0181	AVK0141-04	11/21/12 20:07
Acetylene	**0.203**	**J**	**0.202**	ppbv	0.7	25	12K0181	AVK0141-04	11/21/12 20:07
Ethane	**4.33**		**4.36**	ppbv	0.8	25	12K0181	AVK0141-04	11/21/12 20:07
Halocarbon 134A	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Propylene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Chlorodifluoromethane	**0.608**	**J**	**0.606**	ppbv	0.2	25	12K0181	AVK0141-04	11/21/12 20:07
Propane	**2.26**		**2.23**	ppbv	2	25	12K0181	AVK0141-04	11/21/12 20:07
Dichlorodifluoromethane	**0.497**	**J**	**0.520**	ppbv	4	25	12K0181	AVK0141-04	11/21/12 20:07
Chloromethane	**0.594**	**J**	**0.597**	ppbv	0.4	25	12K0181	AVK0141-04	11/21/12 20:07
Isobutane	**0.424**	**J**	**0.425**	ppbv	0.2	25	12K0181	AVK0141-04	11/21/12 20:07
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Acetaldehyde	**1.44**		**1.48**	ppbv	3	25	12K0181	AVK0141-04	11/21/12 20:07
Vinyl chloride	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1-Butene/Isobutene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,3-Butadiene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Butane	**0.761**	**J**	**0.747**	ppbv	2	25	12K0181	AVK0141-04	11/21/12 20:07
trans-2-Butene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Neopentane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Dichlorofluoromethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Bromomethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
cis-2-Butene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Chloroethane	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Vinyl bromide	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
3-Methyl-1-butene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Acetonitrile	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Isopentane	**0.317**	**J**	**0.325**	ppbv	2	25	12K0181	AVK0141-04	11/21/12 20:07
Trichlorofluoromethane	**0.256**	**J**	**0.264**	ppbv	3	25	12K0181	AVK0141-04	11/21/12 20:07

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Received: 11/15/12 08:30
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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0181-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
1-Pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Acetone	**1.70**	**B**	**1.65**	ppbv	3	25	12K0181	AVK0141-04	11/21/12 20:07
Acrylonitrile	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
n-Pentane	**0.237**	**J**	**0.232**	ppbv	2	25	12K0181	AVK0141-04	11/21/12 20:07
Diethyl ether	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Isoprene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
trans-2-Pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,1-Dichloroethene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
cis-2-Pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Methylene chloride	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2-Methyl-2-butene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Carbon disulfide	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Allyl chloride	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,1,2-Trichlorotrifluoroethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2,2-Dimethylbutane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Cyclopentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
trans-1,2-Dichloroethene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
4-Methyl-1-pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,1-Dichloroethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Cyclopentane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2,3-Dimethylbutane	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Methyl tert-Butyl Ether	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Isohexane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Vinyl acetate	ND	**U**	ND	ppbv		50	12K0181	AVK0141-04	11/21/12 20:07
cis/trans-4-Methyl-2-pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Butyraldehyde	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2-Butanone (MEK)	0.162	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Chloroprene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
3-Methylpentane	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2-Methyl-1-pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1-Hexene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
cis-1,2-Dichloroethene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Bromochloromethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2-Ethyl-1-butene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0181-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Hexane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Chloroform	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
cis-3-Hexene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
trans-2-Hexene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2-Methyl-2-pentene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
cis-3-Methyl-2-pentene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
cis-2-Hexene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Methylcyclopentane	ND	R4, U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,2-Dichloroethane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2,4-Dimethylpentane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,1,1-Trichloroethane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1-Methylcyclopentene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Benzene	**0.0632**	**J**	**0.0723**	ppbv	13	25	12K0181	AVK0141-04	11/21/12 20:07
Carbon tetrachloride	**0.123**	**J**	**0.149**	ppbv	19	25	12K0181	AVK0141-04	11/21/12 20:07
Cyclohexane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Isoheptane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2,3-Dimethylpentane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Cyclohexene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
3-Methylhexane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,2-Dichloropropane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Bromodichloromethane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Trichloroethene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1-Heptene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2,2,4-Trimethylpentane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
trans-3-Heptene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Heptane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
cis-3-Heptene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
trans-2-Heptene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2,4,4-Trimethyl-1-pentene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
cis-1,3-Dichloropropene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
4-Methyl-2-pentanone (MIBK)	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Methylcyclohexane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2,4,4-Trimethyl-2-pentene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2,5-Dimethylhexane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07

Golder Associates Ltd.
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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0181-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
2,2,3-Trimethylpentane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
trans-1,3-Dichloropropene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,1,2-Trichloroethane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2,3,4-Trimethylpentane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Toluene	**0.142**	**J**	**0.133**	ppbv	7	25	12K0181	AVK0141-04	11/21/12 20:07
2-Hexanone	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2-Methylheptane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1-Methylcyclohexene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Chlorodibromomethane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
3-Methylheptane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Hexanal	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,2-Dibromoethane (EDB)	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2,2,5-Trimethylhexane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1-Octene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
n-Octane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Tetrachloroethene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
cis-2-Octene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Chlorobenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Ethylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
m-Xylene & p-Xylene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Bromoform	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Butyl acrylate	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Heptanal	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Styrene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,1,2,2-Tetrachloroethane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
o-Xylene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Xylenes, total	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1-Nonene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
4-Nonene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
n-Nonane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Isopropylbenzene	ND	U	ND	ppbv		50	12K0181	AVK0141-04	11/21/12 20:07
Benzaldehyde	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
alpha-Pinene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2 & 3-Chlorotoluene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07

Golder Associates Ltd.
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Julie Burghardt

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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0181-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
4-Chlorotoluene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
n-Propylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
3-Ethyltoluene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
4-Ethyltoluene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,3,5-Trimethylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
2-Ethyltoluene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
beta-Pinene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,2,4-Trimethylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
tert-Butylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1-Decene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Benzyl chloride	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,3-Dichlorobenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
n-Decane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,4-Dichlorobenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Isobutylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,2,3-Trimethylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
4-Isopropyltoluene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,2-Dichlorobenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Limonene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Indan	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Indene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,3-Diethylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,4-Diethylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
n-Butylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1-Undecene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
n-Undecane	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,2,4-Trichlorobenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Naphthalene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Hexachlorobutadiene	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
1,2-Dichloroethene, Total	ND	U	ND	ppbv		25	12K0181	AVK0141-04	11/21/12 20:07
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*103%*						12K0181		11/21/12 20:07
Surr: Fluorobenzene (46-118%)	*84%*						12K0181		11/21/12 20:07
Surr: Toluene-d8 (70-136%)	*108%*						12K0181		11/21/12 20:07
Surr: 1,4-Dichlorobutane (38-135%)	*87%*						12K0181		11/21/12 20:07

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Julie Burghardt

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Project Number: 08-1436-0106

Received: 11/15/12 08:30
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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0181-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Surr: 4-Bromofluorobenzene (51-128%)	*80%*						12K0181		11/21/12 20:07
Sample ID: 12K0181-DUP2 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Ethene	**1.62**		**1.60**	ppbv	1	25	12K0181	AVK0141-05	11/21/12 22:04
Acetylene	**0.272**	**J**	**0.266**	ppbv	2	25	12K0181	AVK0141-05	11/21/12 22:04
Ethane	**3.11**		**3.09**	ppbv	0.5	25	12K0181	AVK0141-05	11/21/12 22:04
Halocarbon 134A	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Propylene	**0.334**	**J**	**0.331**	ppbv	0.8	25	12K0181	AVK0141-05	11/21/12 22:04
Chlorodifluoromethane	**1.01**	**J**	**0.980**	ppbv	3	25	12K0181	AVK0141-05	11/21/12 22:04
Propane	**2.17**		**2.14**	ppbv	1	25	12K0181	AVK0141-05	11/21/12 22:04
Dichlorodifluoromethane	**0.473**	**J**	**0.468**	ppbv	1	25	12K0181	AVK0141-05	11/21/12 22:04
Chloromethane	**0.732**	**J**	**0.719**	ppbv	2	25	12K0181	AVK0141-05	11/21/12 22:04
Isobutane	**0.366**	**J**	**0.371**	ppbv	1	25	12K0181	AVK0141-05	11/21/12 22:04
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Acetaldehyde	**9.30**		**9.54**	ppbv	3	25	12K0181	AVK0141-05	11/21/12 22:04
Vinyl chloride	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1-Butene/Isobutene	**0.243**	**J**	**0.247**	ppbv	2	25	12K0181	AVK0141-05	11/21/12 22:04
1,3-Butadiene	**0.732**	**J**	**0.712**	ppbv	3	25	12K0181	AVK0141-05	11/21/12 22:04
Butane	**0.801**	**J**	**0.798**	ppbv	0.4	25	12K0181	AVK0141-05	11/21/12 22:04
trans-2-Butene	**0.0839**	**J**	**0.0851**	ppbv	1	25	12K0181	AVK0141-05	11/21/12 22:04
Neopentane	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Dichlorofluoromethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Bromomethane	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
cis-2-Butene	**0.110**	**J**	**0.105**	ppbv	4	25	12K0181	AVK0141-05	11/21/12 22:04
Chloroethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Vinyl bromide	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
3-Methyl-1-butene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Acetonitrile	**0.261**	**J**	**0.256**	ppbv	2	25	12K0181	AVK0141-05	11/21/12 22:04
Isopentane	**0.332**	**J**	**0.344**	ppbv	4	25	12K0181	AVK0141-05	11/21/12 22:04
Trichlorofluoromethane	**0.250**	**J**	**0.246**	ppbv	1	25	12K0181	AVK0141-05	11/21/12 22:04
1-Pentene	**0.119**	**J**	**0.126**	ppbv	6	25	12K0181	AVK0141-05	11/21/12 22:04
Acetone	**6.53**	**B**	**7.47**	ppbv	13	25	12K0181	AVK0141-05	11/21/12 22:04

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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0181-DUP2 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Acrylonitrile	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
n-Pentane	**0.235**	**J**	**0.213**	ppbv	10	25	12K0181	AVK0141-05	11/21/12 22:04
Diethyl ether	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Isoprene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
trans-2-Pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,1-Dichloroethene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
cis-2-Pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Methylene chloride	**0.0890**	**J**	**0.0935**	ppbv	5	25	12K0181	AVK0141-05	11/21/12 22:04
2-Methyl-2-butene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Carbon disulfide	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Allyl chloride	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,1,2-Trichlorotrifluoroethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2,2-Dimethylbutane	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Cyclopentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
trans-1,2-Dichloroethene	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
4-Methyl-1-pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,1-Dichloroethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Cyclopentane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2,3-Dimethylbutane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Methyl tert-Butyl Ether	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Isohexane	**ND**	**J**	**0.0665**	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Vinyl acetate	ND	**U**	ND	ppbv		50	12K0181	AVK0141-05	11/21/12 22:04
cis/trans-4-Methyl-2-pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Butyraldehyde	**0.750**	**J**	**0.670**	ppbv	11	25	12K0181	AVK0141-05	11/21/12 22:04
2-Butanone (MEK)	**1.27**		**1.28**	ppbv	0.6	25	12K0181	AVK0141-05	11/21/12 22:04
Chloroprene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
3-Methylpentane	**ND**	**R4, J**	**0.103**	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2-Methyl-1-pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1-Hexene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
cis-1,2-Dichloroethene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Bromochloromethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2-Ethyl-1-butene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Hexane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Chloroform	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0181-DUP2 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
cis-3-Hexene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
trans-2-Hexene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2-Methyl-2-pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
cis-3-Methyl-2-pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
cis-2-Hexene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Methylcyclopentane	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,2-Dichloroethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2,4-Dimethylpentane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,1,1-Trichloroethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1-Methylcyclopentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Benzene	**0.0873**	**J**	**0.0834**	ppbv	5	25	12K0181	AVK0141-05	11/21/12 22:04
Carbon tetrachloride	**0.123**	**J**	**0.144**	ppbv	16	25	12K0181	AVK0141-05	11/21/12 22:04
Cyclohexane	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Isoheptane	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2,3-Dimethylpentane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Cyclohexene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
3-Methylhexane	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,2-Dichloropropane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Bromodichloromethane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Trichloroethene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1-Heptene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2,2,4-Trimethylpentane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
trans-3-Heptene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Heptane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
cis-3-Heptene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
trans-2-Heptene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2,4,4-Trimethyl-1-pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
cis-1,3-Dichloropropene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
4-Methyl-2-pentanone (MIBK)	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Methylcyclohexane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2,4,4-Trimethyl-2-pentene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2,5-Dimethylhexane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2,2,3-Trimethylpentane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
trans-1,3-Dichloropropene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04

Golder Associates Ltd.
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Received: 11/15/12 08:30
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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0181-DUP2 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
1,1,2-Trichloroethane	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2,3,4-Trimethylpentane	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Toluene	**0.153**	**J**	**0.161**	ppbv	5	25	12K0181	AVK0141-05	11/21/12 22:04
2-Hexanone	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2-Methylheptane	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1-Methylcyclohexene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Chlorodibromomethane	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
3-Methylheptane	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Hexanal	**0.802**	**J**	**0.628**	ppbv	24	25	12K0181	AVK0141-05	11/21/12 22:04
1,2-Dibromoethane (EDB)	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2,2,5-Trimethylhexane	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1-Octene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
n-Octane	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Tetrachloroethene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
cis-2-Octene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Chlorobenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Ethylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
m-Xylene & p-Xylene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Bromoform	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Butyl acrylate	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Heptanal	**0.408**	**J**	**0.379**	ppbv	7	25	12K0181	AVK0141-05	11/21/12 22:04
Styrene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,1,2,2-Tetrachloroethane	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
o-Xylene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Xylenes, total	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1-Nonene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
4-Nonene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
n-Nonane	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Isopropylbenzene	ND	U	ND	ppbv		50	12K0181	AVK0141-05	11/21/12 22:04
Benzaldehyde	**0.803**	**J**	**0.814**	ppbv	1	25	12K0181	AVK0141-05	11/21/12 22:04
alpha-Pinene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2 & 3-Chlorotoluene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
4-Chlorotoluene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
n-Propylbenzene	ND	U	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04

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Julie Burghardt

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Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0181-DUP2 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
3-Ethyltoluene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
4-Ethyltoluene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,3,5-Trimethylbenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
2-Ethyltoluene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
beta-Pinene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,2,4-Trimethylbenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
tert-Butylbenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1-Decene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Benzyl chloride	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,3-Dichlorobenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
n-Decane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,4-Dichlorobenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Isobutylbenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,2,3-Trimethylbenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
4-Isopropyltoluene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,2-Dichlorobenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Limonene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Indan	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Indene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,3-Diethylbenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,4-Diethylbenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
n-Butylbenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1-Undecene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
n-Undecane	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,2,4-Trichlorobenzene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Naphthalene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Hexachlorobutadiene	ND	**U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
1,2-Dichloroethene, Total	ND	**R4, U**	ND	ppbv		25	12K0181	AVK0141-05	11/21/12 22:04
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*104%*						12K0181		11/21/12 22:04
Surr: Fluorobenzene (46-118%)	*90%*						12K0181		11/21/12 22:04
Surr: Toluene-d8 (70-136%)	*102%*						12K0181		11/21/12 22:04
Surr: 1,4-Dichlorobutane (38-135%)	*86%*						12K0181		11/21/12 22:04
Surr: 4-Bromofluorobenzene (51-128%)	*81%*						12K0181		11/21/12 22:04

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Work Order: AVK0120
Project: AENV Canada Creosote
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Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0235-DUP1 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Ethene	**78.7**		**84.8**	ppbv	7	25	12K0235	AVK0142-01	11/30/12 21:52
Acetylene	**2.32**	**J**	**2.15**	ppbv	8	25	12K0235	AVK0142-01	11/30/12 21:52
Ethane	**170**		**175**	ppbv	3	25	12K0235	AVK0142-01	11/30/12 21:52
Halocarbon 134A	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Propylene	**53.6**		**53.1**	ppbv	0.9	25	12K0235	AVK0142-01	11/30/12 21:52
Chlorodifluoromethane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Propane	**107**		**107**	ppbv	0.4	25	12K0235	AVK0142-01	11/30/12 21:52
Dichlorodifluoromethane	**0.659**	**J**	**0.673**	ppbv	2	25	12K0235	AVK0142-01	11/30/12 21:52
Chloromethane	**0.499**	**J**	**0.482**	ppbv	3	25	12K0235	AVK0142-01	11/30/12 21:52
Isobutane	**17.2**		**17.1**	ppbv	0.5	25	12K0235	AVK0142-01	11/30/12 21:52
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Acetaldehyde	**7.99**	**B**	**8.65**	ppbv	8	25	12K0235	AVK0142-01	11/30/12 21:52
Vinyl chloride	**2.32**	**J**	**2.38**	ppbv	2	25	12K0235	AVK0142-01	11/30/12 21:52
1-Butene/Isobutene	**79.3**		**78.9**	ppbv	0.5	25	12K0235	AVK0142-01	11/30/12 21:52
1,3-Butadiene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Butane	**23.9**		**24.1**	ppbv	0.7	25	12K0235	AVK0142-01	11/30/12 21:52
trans-2-Butene	**4.31**	**J**	**4.36**	ppbv	1	25	12K0235	AVK0142-01	11/30/12 21:52
Neopentane	**1.18**	**J**	**1.19**	ppbv	0.7	25	12K0235	AVK0142-01	11/30/12 21:52
Dichlorofluoromethane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Bromomethane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
cis-2-Butene	**2.59**	**J**	**2.57**	ppbv	1	25	12K0235	AVK0142-01	11/30/12 21:52
Chloroethane	**3.78**	**J**	**3.83**	ppbv	1	25	12K0235	AVK0142-01	11/30/12 21:52
Vinyl bromide	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
3-Methyl-1-butene	**2.34**	**J**	**2.26**	ppbv	3	25	12K0235	AVK0142-01	11/30/12 21:52
Acetonitrile	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Isopentane	**10.7**		**11.0**	ppbv	3	25	12K0235	AVK0142-01	11/30/12 21:52
Trichlorofluoromethane	**0.416**	**J**	**0.435**	ppbv	5	25	12K0235	AVK0142-01	11/30/12 21:52
1-Pentene	**0.884**	**J**	**0.934**	ppbv	5	25	12K0235	AVK0142-01	11/30/12 21:52
Acetone	**3.83**	**J, B**	**3.92**	ppbv	2	25	12K0235	AVK0142-01	11/30/12 21:52
Acrylonitrile	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
n-Pentane	**3.11**	**J**	**3.17**	ppbv	2	25	12K0235	AVK0142-01	11/30/12 21:52
Diethyl ether	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Isoprene	**0.399**	**J**	**0.474**	ppbv	17	25	12K0235	AVK0142-01	11/30/12 21:52
trans-2-Pentene	**0.535**	**J**	**0.573**	ppbv	7	25	12K0235	AVK0142-01	11/30/12 21:52

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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0235-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
1,1-Dichloroethene	**111**		**118**	ppbv	7	25	12K0235	AVK0142-01	11/30/12 21:52
cis-2-Pentene	**ND**	**J**	**0.399**	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Methylene chloride	**4.04**	**J**	**4.37**	ppbv	8	25	12K0235	AVK0142-01	11/30/12 21:52
2-Methyl-2-butene	**3.92**	**J**	**4.16**	ppbv	6	25	12K0235	AVK0142-01	11/30/12 21:52
Carbon disulfide	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Allyl chloride	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,1,2-Trichlorotrifluoroethane	**0.518**	**J**	**0.521**	ppbv	0.5	25	12K0235	AVK0142-01	11/30/12 21:52
2,2-Dimethylbutane	**0.416**	**J**	**0.449**	ppbv	8	25	12K0235	AVK0142-01	11/30/12 21:52
Cyclopentene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
trans-1,2-Dichloroethene	**54.0**		**58.4**	ppbv	8	25	12K0235	AVK0142-01	11/30/12 21:52
4-Methyl-1-pentene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,1-Dichloroethane	**47.2**		**51.0**	ppbv	8	25	12K0235	AVK0142-01	11/30/12 21:52
Cyclopentane	**0.584**	**J**	**0.582**	ppbv	0.5	25	12K0235	AVK0142-01	11/30/12 21:52
2,3-Dimethylbutane	**1.06**	**J**	**1.12**	ppbv	5	25	12K0235	AVK0142-01	11/30/12 21:52
Methyl tert-Butyl Ether	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Isohexane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Vinyl acetate	ND	**U**	ND	ppbv		50	12K0235	AVK0142-01	11/30/12 21:52
cis/trans-4-Methyl-2-pentene	**1.76**	**J**	**1.80**	ppbv	2	25	12K0235	AVK0142-01	11/30/12 21:52
Butyraldehyde	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2-Butanone (MEK)	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Chloroprene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
3-Methylpentane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2-Methyl-1-pentene	**0.717**	**J**	**0.767**	ppbv	7	25	12K0235	AVK0142-01	11/30/12 21:52
1-Hexene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
cis-1,2-Dichloroethene	**1390**		**1520**	ppbv	9	25	12K0235	AVK0142-01	11/30/12 21:52
Bromochloromethane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2-Ethyl-1-butene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Hexane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Chloroform	**37.2**		**40.1**	ppbv	8	25	12K0235	AVK0142-01	11/30/12 21:52
cis-3-Hexene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
trans-2-Hexene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2-Methyl-2-pentene	**2.60**	**J**	**2.83**	ppbv	9	25	12K0235	AVK0142-01	11/30/12 21:52
cis-3-Methyl-2-pentene	**1.31**	**J**	**1.43**	ppbv	9	25	12K0235	AVK0142-01	11/30/12 21:52
cis-2-Hexene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0235-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Methylcyclopentane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,2-Dichloroethane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2,4-Dimethylpentane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,1,1-Trichloroethane	**92.8**		**98.4**	ppbv	6	25	12K0235	AVK0142-01	11/30/12 21:52
1-Methylcyclopentene	**0.698**	**J**	**0.615**	ppbv	13	25	12K0235	AVK0142-01	11/30/12 21:52
Benzene	**0.994**	**J**	**0.994**	ppbv	0	25	12K0235	AVK0142-01	11/30/12 21:52
Carbon tetrachloride	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Cyclohexane	**0.568**	**J**	**0.535**	ppbv	6	25	12K0235	AVK0142-01	11/30/12 21:52
Isoheptane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2,3-Dimethylpentane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Cyclohexene	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
3-Methylhexane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,2-Dichloropropane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Bromodichloromethane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Trichloroethene	**1100**		**1110**	ppbv	2	25	12K0235	AVK0142-01	11/30/12 21:52
1-Heptene	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2,2,4-Trimethylpentane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
trans-3-Heptene	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Heptane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
cis-3-Heptene	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
trans-2-Heptene	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2,4,4-Trimethyl-1-pentene	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
cis-1,3-Dichloropropene	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
4-Methyl-2-pentanone (MIBK)	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Methylcyclohexane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2,4,4-Trimethyl-2-pentene	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2,5-Dimethylhexane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2,2,3-Trimethylpentane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
trans-1,3-Dichloropropene	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,1,2-Trichloroethane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2,3,4-Trimethylpentane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Toluene	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2-Hexanone	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2-Methylheptane	ND	U	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52

Golder Associates Ltd.
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Julie Burghardt

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Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0235-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
1-Methylcyclohexene	**0.753**	**J**	**0.778**	ppbv	3	25	12K0235	AVK0142-01	11/30/12 21:52
Chlorodibromomethane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
3-Methylheptane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Hexanal	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,2-Dibromoethane (EDB)	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2,2,5-Trimethylhexane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1-Octene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
n-Octane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Tetrachloroethene	**64.0**		**65.3**	ppbv	2	25	12K0235	AVK0142-01	11/30/12 21:52
cis-2-Octene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Chlorobenzene	**0.518**	**J**	**0.576**	ppbv	11	25	12K0235	AVK0142-01	11/30/12 21:52
Ethylbenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
m-Xylene & p-Xylene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Bromoform	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Butyl acrylate	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Heptanal	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Styrene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,1,2,2-Tetrachloroethane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
o-Xylene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Xylenes, total	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1-Nonene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
4-Nonene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
n-Nonane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Isopropylbenzene	ND	**U**	ND	ppbv		50	12K0235	AVK0142-01	11/30/12 21:52
Benzaldehyde	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
alpha-Pinene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2 & 3-Chlorotoluene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
4-Chlorotoluene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
n-Propylbenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
3-Ethyltoluene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
4-Ethyltoluene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,3,5-Trimethylbenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
2-Ethyltoluene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
beta-Pinene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52

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Received: 11/15/12 08:30
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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 12K0235-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
1,2,4-Trimethylbenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
tert-Butylbenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1-Decene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Benzyl chloride	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,3-Dichlorobenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
n-Decane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,4-Dichlorobenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Isobutylbenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,2,3-Trimethylbenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
4-Isopropyltoluene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,2-Dichlorobenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Limonene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Indan	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Indene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,3-Diethylbenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,4-Diethylbenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
n-Butylbenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1-Undecene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
n-Undecane	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,2,4-Trichlorobenzene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Naphthalene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
Hexachlorobutadiene	ND	**U**	ND	ppbv		25	12K0235	AVK0142-01	11/30/12 21:52
1,2-Dichloroethene, Total	**1450**		**1570**	ppbv	9	25	12K0235	AVK0142-01	11/30/12 21:52
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*103%*						12K0235		11/30/12 21:52
Surr: Fluorobenzene (46-118%)	*94%*						12K0235		11/30/12 21:52
Surr: Toluene-d8 (70-136%)	*97%*						12K0235		11/30/12 21:52
Surr: 1,4-Dichlorobutane (38-135%)	*87%*						12K0235		11/30/12 21:52
Surr: 4-Bromofluorobenzene (51-128%)	*84%*						12K0235		11/30/12 21:52

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Received: 11/15/12 08:30
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PROJECT QUALITY CONTROL DATA

LCS

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0154-BS1 (LCS - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Propylene	10.8		ppbv	0.400	2.00	10.6	102%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Chlorodifluoromethane	10.7		ppbv	0.400	2.00	10.6	101%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Propane	10.6		ppbv	0.400	2.00	10.5	101%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Dichlorodifluoromethane	10.9		ppbv	0.400	2.00	10.5	104%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Chloromethane	11.4		ppbv	0.400	2.00	10.7	106%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Isobutane	10.4		ppbv	0.400	2.00	10.5	100%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,2-Dichloro-1,1,2,2-tetrafluoroethane	9.62		ppbv	0.400	2.00	10.6	91%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Vinyl chloride	11.2		ppbv	0.400	2.00	10.6	105%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1-Butene/Isobutene	10.6		ppbv	0.400	2.00	10.4	102%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,3-Butadiene	11.6		ppbv	0.400	2.00	10.8	107%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Butane	10.5		ppbv	0.400	2.00	10.5	100%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Methanol	12.2	B	ppbv	0.400	2.00	10.8	113%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
trans-2-Butene	10.7		ppbv	0.400	2.00	10.3	104%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Bromomethane	11.3		ppbv	0.400	2.00	10.5	108%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
cis-2-Butene	11.7		ppbv	0.400	2.00	11.1	105%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Chloroethane	11.4		ppbv	0.400	2.00	10.4	110%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Vinyl bromide	10.8		ppbv	0.400	2.00	10.7	101%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
3-Methyl-1-butene	12.3		ppbv	0.400	2.00	10.8	114%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Acetonitrile	11.1		ppbv	0.400	2.00	10.4	107%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Isopentane	11.0		ppbv	0.400	2.00	11.0	100%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Trichlorofluoromethane	11.6		ppbv	0.400	2.00	11.0	106%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1-Pentene	12.6		ppbv	0.400	2.00	11.4	110%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Acetone	11.9	B	ppbv	0.400	2.00	11.0	108%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Isopropyl alcohol	12.6		ppbv	0.400	2.00	12.0	106%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Acrylonitrile	12.5		ppbv	0.400	2.00	11.0	114%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
n-Pentane	12.0		ppbv	0.400	2.00	11.0	109%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Diethyl ether	12.9		ppbv	0.400	2.00	10.9	118%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Isoprene	12.2		ppbv	0.400	2.00	10.9	112%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
trans-2-Pentene	12.2		ppbv	0.400	2.00	11.1	110%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,1-Dichloroethene	11.8		ppbv	0.400	2.00	11.1	106%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
cis-2-Pentene	12.2		ppbv	0.400	2.00	11.2	109%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Methylene chloride	12.1		ppbv	0.400	2.00	10.8	112%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
2-Methyl-2-butene	12.4		ppbv	0.400	2.00	11.7	106%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Carbon disulfide	9.52		ppbv	0.400	2.00	11.0	86%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Allyl chloride	12.3		ppbv	0.400	2.00	10.8	114%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,1,2-Trichlorotrifluoroethane	12.2		ppbv	0.400	2.00	11.1	109%	50 - 150	GCMSR1	11/19/12 11:28	12K0154

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PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0154-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
trans-1,2-Dichloroethene	10.9		ppbv	0.400	2.00	10.9	100%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
4-Methyl-1-pentene	11.8		ppbv	0.400	2.00	10.9	108%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,1-Dichloroethane	11.8		ppbv	0.400	2.00	10.9	108%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Methyl tert-Butyl Ether	12.8		ppbv	0.400	2.00	11.0	116%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Vinyl acetate	11.4		ppbv	0.400	2.00	11.3	101%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
2-Butanone (MEK)	10.5		ppbv	0.400	2.00	11.3	93%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Chloroprene	10.8		ppbv	0.400	2.00	10.9	99%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
cis-1,2-Dichloroethene	11.7		ppbv	0.400	2.00	11.1	106%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Hexane	11.4		ppbv	0.400	2.00	11.5	98%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Chloroform	12.0		ppbv	0.400	2.00	10.7	112%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
trans-2-Hexene	12.1		ppbv	0.400	2.00	11.3	107%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
cis-2-Hexene	11.1		ppbv	0.400	2.00	10.8	103%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,2-Dichloroethane	12.2		ppbv	0.400	2.00	10.9	112%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,1,1-Trichloroethane	12.0		ppbv	0.400	2.00	10.9	110%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Benzene	13.0		ppbv	0.400	2.00	10.9	119%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Carbon tetrachloride	13.3		ppbv	0.400	2.00	12.0	111%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
n-Butanol	9.95		ppbv	0.400	2.00	12.0	83%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Cyclohexane	11.1		ppbv	0.400	2.00	11.1	100%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,2-Dichloropropane	13.6		ppbv	0.400	2.00	11.0	124%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Bromodichloromethane	13.7		ppbv	0.400	2.00	11.1	123%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Trichloroethene	11.6		ppbv	0.400	2.00	11.1	105%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,4-Dioxane	12.2		ppbv	0.400	2.00	11.1	110%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
2,2,4-Trimethylpentane	11.8		ppbv	0.400	2.00	11.0	107%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Heptane	11.8		ppbv	0.400	2.00	11.2	105%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
cis-1,3-Dichloropropene	14.2		ppbv	0.400	2.00	11.2	126%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
4-Methyl-2-pentanone (MIBK)	10.1		ppbv	0.400	2.00	11.4	88%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
trans-1,3-Dichloropropene	13.4		ppbv	0.400	2.00	10.4	129%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,1,2-Trichloroethane	13.8		ppbv	0.400	2.00	11.1	124%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Toluene	13.9		ppbv	0.400	2.00	11.1	125%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
2-Hexanone	10.9		ppbv	0.400	2.00	11.7	94%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Chlorodibromomethane	15.2		ppbv	0.400	2.00	11.8	129%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,2-Dibromoethane (EDB)	14.1		ppbv	0.400	2.00	11.1	126%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
n-Octane	12.5		ppbv	0.400	2.00	11.0	113%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Tetrachloroethene	13.0		ppbv	0.400	2.00	10.4	125%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Chlorobenzene	14.3		ppbv	0.400	2.00	11.2	127%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Ethylbenzene	14.4		ppbv	0.400	2.00	11.1	130%	50 - 150	GCMSR1	11/19/12 11:28	12K0154

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0154-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
m-Xylene & p-Xylene	28.9		ppbv	0.800	2.00	21.8	132%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Bromoform	**17.2**	**L1**	**ppbv**	**0.400**	**2.00**	**10.9**	**158%**	**50 - 150**	**GCMSR1**	**11/19/12 11:28**	**12K0154**
Styrene	14.8		ppbv	0.400	2.00	11.2	132%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,1,2,2-Tetrachloroethane	14.8		ppbv	0.400	2.00	11.2	132%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
o-Xylene	14.5		ppbv	0.400	2.00	11.2	129%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Xylenes, total	43.4		ppbv	1.20	2.00	33.0	131%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
n-Nonane	13.4		ppbv	0.400	2.00	10.9	123%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Isopropylbenzene	13.7		ppbv	0.400	2.00	10.8	127%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
2 & 3-Chlorotoluene	13.2		ppbv	0.800	2.00	10.9	121%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
n-Propylbenzene	14.2		ppbv	0.400	2.00	10.7	132%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
4-Ethyltoluene	15.2		ppbv	0.400	2.00	11.4	133%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,3,5-Trimethylbenzene	14.0		ppbv	0.400	2.00	11.0	127%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
1,2-Dichloroethene, Total	22.7		ppbv	0.800	2.00	22.0	103%	50 - 150	GCMSR1	11/19/12 11:28	12K0154
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*101%*								GCMSR1	11/19/12 11:28	12K0154
Surr: Fluorobenzene (46-118%)	*99%*								GCMSR1	11/19/12 11:28	12K0154
Surr: Toluene-d8 (70-136%)	*97%*								GCMSR1	11/19/12 11:28	12K0154
Surr: 1,4-Dichlorobutane (38-135%)	*106%*								GCMSR1	11/19/12 11:28	12K0154
Surr: 4-Bromofluorobenzene (51-128%)	*104%*								GCMSR1	11/19/12 11:28	12K0154
Sample ID: 12K0167-BS1 (LCS - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Propylene	10.3		ppbv	0.400	2.00	10.6	97%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Chlorodifluoromethane	10.1		ppbv	0.400	2.00	10.6	96%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Propane	9.98		ppbv	0.400	2.00	10.5	95%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Dichlorodifluoromethane	10.1		ppbv	0.400	2.00	10.5	97%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Chloromethane	10.7		ppbv	0.400	2.00	10.7	100%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Isobutane	9.87		ppbv	0.400	2.00	10.5	94%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,2-Dichloro-1,1,2,2-tetrafluoroethane	8.98		ppbv	0.400	2.00	10.6	85%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Vinyl chloride	10.3		ppbv	0.400	2.00	10.6	97%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1-Butene/Isobutene	10.1		ppbv	0.400	2.00	10.4	97%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,3-Butadiene	11.0		ppbv	0.400	2.00	10.8	102%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Butane	9.93		ppbv	0.400	2.00	10.5	95%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Methanol	11.6		ppbv	0.400	2.00	10.8	107%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
trans-2-Butene	10.2		ppbv	0.400	2.00	10.3	99%	50 - 150	GCMSR1	11/20/12 11:53	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0167-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Bromomethane	10.5		ppbv	0.400	2.00	10.5	100%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
cis-2-Butene	11.1		ppbv	0.400	2.00	11.1	100%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Chloroethane	10.6		ppbv	0.400	2.00	10.4	102%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Vinyl bromide	9.98		ppbv	0.400	2.00	10.7	93%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
3-Methyl-1-butene	11.6		ppbv	0.400	2.00	10.8	108%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Acetonitrile	10.8		ppbv	0.400	2.00	10.4	104%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Isopentane	10.6		ppbv	0.400	2.00	11.0	96%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Trichlorofluoromethane	11.0		ppbv	0.400	2.00	11.0	100%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1-Pentene	12.1		ppbv	0.400	2.00	11.4	106%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Acetone	11.4	B	ppbv	0.400	2.00	11.0	104%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Isopropyl alcohol	11.8		ppbv	0.400	2.00	12.0	98%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Acrylonitrile	11.9		ppbv	0.400	2.00	11.0	108%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
n-Pentane	11.6		ppbv	0.400	2.00	11.0	105%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Diethyl ether	12.0		ppbv	0.400	2.00	10.9	110%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Isoprene	11.5		ppbv	0.400	2.00	10.9	105%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
trans-2-Pentene	11.5		ppbv	0.400	2.00	11.1	104%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,1-Dichloroethene	11.2		ppbv	0.400	2.00	11.1	101%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
cis-2-Pentene	11.5		ppbv	0.400	2.00	11.2	102%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Methylene chloride	11.4		ppbv	0.400	2.00	10.8	106%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
2-Methyl-2-butene	11.7		ppbv	0.400	2.00	11.7	101%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Carbon disulfide	8.96		ppbv	0.400	2.00	11.0	81%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Allyl chloride	11.9		ppbv	0.400	2.00	10.8	110%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,1,2-Trichlorotrifluoroethane	11.4		ppbv	0.400	2.00	11.1	102%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
trans-1,2-Dichloroethene	10.1		ppbv	0.400	2.00	10.9	92%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
4-Methyl-1-pentene	11.2		ppbv	0.400	2.00	10.9	103%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,1-Dichloroethane	10.9		ppbv	0.400	2.00	10.9	100%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Methyl tert-Butyl Ether	11.6		ppbv	0.400	2.00	11.0	106%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Vinyl acetate	10.7		ppbv	0.400	2.00	11.3	95%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
2-Butanone (MEK)	9.90		ppbv	0.400	2.00	11.3	87%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Chloroprene	9.97		ppbv	0.400	2.00	10.9	91%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
cis-1,2-Dichloroethene	10.8		ppbv	0.400	2.00	11.1	97%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Hexane	10.5		ppbv	0.400	2.00	11.5	91%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Chloroform	10.9		ppbv	0.400	2.00	10.7	102%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
trans-2-Hexene	11.3		ppbv	0.400	2.00	11.3	99%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
cis-2-Hexene	10.3		ppbv	0.400	2.00	10.8	95%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,2-Dichloroethane	11.2		ppbv	0.400	2.00	10.9	103%	50 - 150	GCMSR1	11/20/12 11:53	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0167-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
1,1,1-Trichloroethane	10.9		ppbv	0.400	2.00	10.9	100%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Benzene	12.7		ppbv	0.400	2.00	10.9	117%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Carbon tetrachloride	13.0		ppbv	0.400	2.00	12.0	109%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
n-Butanol	9.48		ppbv	0.400	2.00	12.0	79%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Cyclohexane	11.1		ppbv	0.400	2.00	11.1	100%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,2-Dichloropropane	13.6		ppbv	0.400	2.00	11.0	123%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Bromodichloromethane	13.5		ppbv	0.400	2.00	11.1	121%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Trichloroethene	11.5		ppbv	0.400	2.00	11.1	103%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,4-Dioxane	12.0		ppbv	0.400	2.00	11.1	108%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
2,2,4-Trimethylpentane	11.8		ppbv	0.400	2.00	11.0	107%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Heptane	11.8		ppbv	0.400	2.00	11.2	105%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
cis-1,3-Dichloropropene	13.9		ppbv	0.400	2.00	11.2	124%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
4-Methyl-2-pentanone (MIBK)	10.2		ppbv	0.400	2.00	11.4	90%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
trans-1,3-Dichloropropene	13.2		ppbv	0.400	2.00	10.4	128%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,1,2-Trichloroethane	13.7		ppbv	0.400	2.00	11.1	123%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Toluene	13.8		ppbv	0.400	2.00	11.1	124%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
2-Hexanone	11.0		ppbv	0.400	2.00	11.7	94%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Chlorodibromomethane	15.0		ppbv	0.400	2.00	11.8	128%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,2-Dibromoethane (EDB)	13.8		ppbv	0.400	2.00	11.1	124%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
n-Octane	12.9		ppbv	0.400	2.00	11.0	117%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Tetrachloroethene	12.7		ppbv	0.400	2.00	10.4	122%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Chlorobenzene	14.1		ppbv	0.400	2.00	11.2	125%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Ethylbenzene	14.2		ppbv	0.400	2.00	11.1	128%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
m-Xylene & p-Xylene	28.6		ppbv	0.800	2.00	21.8	131%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Bromoform	16.3		ppbv	0.400	2.00	10.9	150%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Styrene	14.4		ppbv	0.400	2.00	11.2	128%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,1,2,2-Tetrachloroethane	14.6		ppbv	0.400	2.00	11.2	130%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
o-Xylene	14.4		ppbv	0.400	2.00	11.2	128%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Xylenes, total	43.0		ppbv	1.20	2.00	33.0	130%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
n-Nonane	13.6		ppbv	0.400	2.00	10.9	125%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Isopropylbenzene	13.7		ppbv	0.400	2.00	10.8	126%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
2 & 3-Chlorotoluene	13.0		ppbv	0.800	2.00	10.9	119%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
n-Propylbenzene	14.1		ppbv	0.400	2.00	10.7	131%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
4-Ethyltoluene	14.9		ppbv	0.400	2.00	11.4	130%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,3,5-Trimethylbenzene	13.9		ppbv	0.400	2.00	11.0	126%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,2,4-Trimethylbenzene	14.5		ppbv	0.400	2.00	10.8	134%	50 - 150	GCMSR1	11/20/12 11:53	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0167-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
tert-Butylbenzene	13.5		ppbv	0.400	2.00	10.8	125%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Benzyl chloride	**19.5**	**L1**	**ppbv**	**0.400**	**2.00**	**11.2**	**174%**	**50 - 150**	**GCMSR1**	**11/20/12 11:53**	**12K0167**
1,3-Dichlorobenzene	13.9		ppbv	0.400	2.00	11.2	124%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
n-Decane	14.1		ppbv	0.400	2.00	11.0	128%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,4-Dichlorobenzene	14.0		ppbv	0.400	2.00	11.0	127%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
4-Isopropyltoluene	13.1		ppbv	0.400	2.00	10.7	123%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,2-Dichlorobenzene	13.8		ppbv	0.400	2.00	11.1	124%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
n-Butylbenzene	13.7		ppbv	0.400	2.00	10.7	128%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
n-Undecane	11.2		ppbv	0.400	2.00	10.9	103%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,2,4-Trichlorobenzene	11.9	B	ppbv	0.400	2.00	11.1	107%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Naphthalene	11.0		ppbv	0.400	2.00	10.5	105%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Hexachlorobutadiene	12.3		ppbv	0.400	2.00	11.0	112%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
1,2-Dichloroethene, Total	20.9		ppbv	0.800	2.00	22.0	95%	50 - 150	GCMSR1	11/20/12 11:53	12K0167
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*99%*								GCMSR1	11/20/12 11:53	12K0167
Surr: Fluorobenzene (46-118%)	*93%*								GCMSR1	11/20/12 11:53	12K0167
Surr: Toluene-d8 (70-136%)	*99%*								GCMSR1	11/20/12 11:53	12K0167
Surr: 1,4-Dichlorobutane (38-135%)	*110%*								GCMSR1	11/20/12 11:53	12K0167
Surr: 4-Bromofluorobenzene (51-128%)	*103%*								GCMSR1	11/20/12 11:53	12K0167
Sample ID: 12K0181-BS1 (LCS - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Ethene	10.6		ppbv	0.400	2.00	11.0	96%	50 - 150	VMSC	11/21/12 11:16	12K0181
Acetylene	8.87		ppbv	0.400	2.00	11.0	81%	50 - 150	VMSC	11/21/12 11:16	12K0181
Ethane	9.93		ppbv	0.400	2.00	11.0	90%	50 - 150	VMSC	11/21/12 11:16	12K0181
Propylene	10.7		ppbv	0.400	2.00	10.6	101%	50 - 150	VMSC	11/21/12 11:16	12K0181
Chlorodifluoromethane	11.7		ppbv	0.400	2.00	10.6	111%	50 - 150	VMSC	11/21/12 11:16	12K0181
Propane	10.2		ppbv	0.400	2.00	10.5	98%	50 - 150	VMSC	11/21/12 11:16	12K0181
Dichlorodifluoromethane	10.9		ppbv	0.400	2.00	10.5	105%	50 - 150	VMSC	11/21/12 11:16	12K0181
Chloromethane	11.7		ppbv	0.400	2.00	10.7	109%	50 - 150	VMSC	11/21/12 11:16	12K0181
Isobutane	10.6		ppbv	0.400	2.00	10.5	101%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,2-Dichloro-1,1,2,2-tetrafluoroethane	8.75		ppbv	0.400	2.00	10.6	83%	50 - 150	VMSC	11/21/12 11:16	12K0181
Vinyl chloride	9.86		ppbv	0.400	2.00	10.6	93%	50 - 150	VMSC	11/21/12 11:16	12K0181
1-Butene/Isobutene	10.8		ppbv	0.400	2.00	10.4	104%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,3-Butadiene	11.9		ppbv	0.400	2.00	10.8	110%	50 - 150	VMSC	11/21/12 11:16	12K0181

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Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0181-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Butane	10.5		ppbv	0.400	2.00	10.5	101%	50 - 150	VMSC	11/21/12 11:16	12K0181
trans-2-Butene	11.4		ppbv	0.400	2.00	10.2	111%	50 - 150	VMSC	11/21/12 11:16	12K0181
Bromomethane	10.8		ppbv	0.400	2.00	10.5	104%	50 - 150	VMSC	11/21/12 11:16	12K0181
cis-2-Butene	12.5		ppbv	0.400	2.00	11.1	113%	50 - 150	VMSC	11/21/12 11:16	12K0181
Chloroethane	11.3		ppbv	0.400	2.00	10.4	109%	50 - 150	VMSC	11/21/12 11:16	12K0181
Vinyl bromide	10.7		ppbv	0.400	2.00	10.7	101%	50 - 150	VMSC	11/21/12 11:16	12K0181
3-Methyl-1-butene	12.0		ppbv	0.400	2.00	10.8	111%	50 - 150	VMSC	11/21/12 11:16	12K0181
Acetonitrile	9.44		ppbv	0.400	2.00	10.4	91%	50 - 150	VMSC	11/21/12 11:16	12K0181
Isopentane	11.0		ppbv	0.400	2.00	11.0	101%	50 - 150	VMSC	11/21/12 11:16	12K0181
Trichlorofluoromethane	11.8		ppbv	0.400	2.00	11.0	107%	50 - 150	VMSC	11/21/12 11:16	12K0181
1-Pentene	12.6		ppbv	0.400	2.00	11.4	110%	50 - 150	VMSC	11/21/12 11:16	12K0181
Acetone	11.6	B	ppbv	0.400	2.00	11.0	105%	50 - 150	VMSC	11/21/12 11:16	12K0181
Acrylonitrile	12.5		ppbv	0.400	2.00	11.0	114%	50 - 150	VMSC	11/21/12 11:16	12K0181
n-Pentane	12.5		ppbv	0.400	2.00	11.0	114%	50 - 150	VMSC	11/21/12 11:16	12K0181
Diethyl ether	10.8		ppbv	0.400	2.00	10.9	100%	50 - 150	VMSC	11/21/12 11:16	12K0181
Isoprene	10.4		ppbv	0.400	2.00	10.9	96%	50 - 150	VMSC	11/21/12 11:16	12K0181
trans-2-Pentene	11.9		ppbv	0.400	2.00	11.1	108%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,1-Dichloroethene	11.9		ppbv	0.400	2.00	11.1	108%	50 - 150	VMSC	11/21/12 11:16	12K0181
cis-2-Pentene	12.0		ppbv	0.400	2.00	11.2	107%	50 - 150	VMSC	11/21/12 11:16	12K0181
Methylene chloride	13.1		ppbv	0.400	2.00	10.8	122%	50 - 150	VMSC	11/21/12 11:16	12K0181
2-Methyl-2-butene	12.3		ppbv	0.400	2.00	11.6	106%	50 - 150	VMSC	11/21/12 11:16	12K0181
Carbon disulfide	9.68		ppbv	0.400	2.00	11.0	88%	50 - 150	VMSC	11/21/12 11:16	12K0181
Allyl chloride	12.2		ppbv	0.400	2.00	10.8	113%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,1,2-Trichlorotrifluoroethane	12.0		ppbv	0.400	2.00	11.1	108%	50 - 150	VMSC	11/21/12 11:16	12K0181
trans-1,2-Dichloroethene	10.9		ppbv	0.400	2.00	10.9	100%	50 - 150	VMSC	11/21/12 11:16	12K0181
4-Methyl-1-pentene	12.8		ppbv	0.400	2.00	10.9	118%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,1-Dichloroethane	11.5		ppbv	0.400	2.00	10.9	106%	50 - 150	VMSC	11/21/12 11:16	12K0181
Methyl tert-Butyl Ether	10.5		ppbv	0.400	2.00	11.0	95%	50 - 150	VMSC	11/21/12 11:16	12K0181
Vinyl acetate	14.0		ppbv	0.400	2.00	11.3	124%	50 - 150	VMSC	11/21/12 11:16	12K0181
2-Butanone (MEK)	10.2		ppbv	0.400	2.00	11.3	90%	50 - 150	VMSC	11/21/12 11:16	12K0181
Chloroprene	11.5		ppbv	0.400	2.00	10.9	106%	50 - 150	VMSC	11/21/12 11:16	12K0181
cis-1,2-Dichloroethene	11.5		ppbv	0.400	2.00	11.1	104%	50 - 150	VMSC	11/21/12 11:16	12K0181
Hexane	11.1		ppbv	0.400	2.00	11.5	97%	50 - 150	VMSC	11/21/12 11:16	12K0181
Chloroform	11.3		ppbv	0.400	2.00	10.7	106%	50 - 150	VMSC	11/21/12 11:16	12K0181
trans-2-Hexene	12.0		ppbv	0.400	2.00	11.3	106%	50 - 150	VMSC	11/21/12 11:16	12K0181
cis-2-Hexene	11.1		ppbv	0.400	2.00	10.8	103%	50 - 150	VMSC	11/21/12 11:16	12K0181

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Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0181-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
1,2-Dichloroethane	12.1		ppbv	0.400	2.00	10.9	111%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,1,1-Trichloroethane	13.0		ppbv	0.400	2.00	10.9	119%	50 - 150	VMSC	11/21/12 11:16	12K0181
Benzene	11.3		ppbv	0.400	2.00	10.9	104%	50 - 150	VMSC	11/21/12 11:16	12K0181
Carbon tetrachloride	17.7		ppbv	0.400	2.00	11.9	148%	50 - 150	VMSC	11/21/12 11:16	12K0181
Cyclohexane	12.9		ppbv	0.400	2.00	11.1	116%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,2-Dichloropropane	12.3		ppbv	0.400	2.00	11.0	112%	50 - 150	VMSC	11/21/12 11:16	12K0181
Bromodichloromethane	14.0		ppbv	0.400	2.00	11.1	127%	50 - 150	VMSC	11/21/12 11:16	12K0181
Trichloroethene	12.3		ppbv	0.400	2.00	11.1	111%	50 - 150	VMSC	11/21/12 11:16	12K0181
2,2,4-Trimethylpentane	13.4		ppbv	0.400	2.00	11.0	122%	50 - 150	VMSC	11/21/12 11:16	12K0181
Heptane	10.8		ppbv	0.400	2.00	11.2	96%	50 - 150	VMSC	11/21/12 11:16	12K0181
cis-1,3-Dichloropropene	12.4		ppbv	0.400	2.00	11.2	111%	50 - 150	VMSC	11/21/12 11:16	12K0181
4-Methyl-2-pentanone (MIBK)	12.5		ppbv	0.400	2.00	11.4	110%	50 - 150	VMSC	11/21/12 11:16	12K0181
trans-1,3-Dichloropropene	12.2		ppbv	0.400	2.00	10.4	118%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,1,2-Trichloroethane	12.0		ppbv	0.400	2.00	11.1	108%	50 - 150	VMSC	11/21/12 11:16	12K0181
Toluene	11.8		ppbv	0.400	2.00	11.1	106%	50 - 150	VMSC	11/21/12 11:16	12K0181
2-Hexanone	13.0	B	ppbv	0.400	2.00	11.6	112%	50 - 150	VMSC	11/21/12 11:16	12K0181
Chlorodibromomethane	16.7		ppbv	0.400	2.00	11.7	143%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,2-Dibromoethane (EDB)	12.9		ppbv	0.400	2.00	11.1	116%	50 - 150	VMSC	11/21/12 11:16	12K0181
n-Octane	12.7		ppbv	0.400	2.00	11.0	115%	50 - 150	VMSC	11/21/12 11:16	12K0181
Tetrachloroethene	12.5		ppbv	0.400	2.00	10.4	121%	50 - 150	VMSC	11/21/12 11:16	12K0181
Chlorobenzene	12.3		ppbv	0.400	2.00	11.2	109%	50 - 150	VMSC	11/21/12 11:16	12K0181
Ethylbenzene	11.6		ppbv	0.400	2.00	11.1	105%	50 - 150	VMSC	11/21/12 11:16	12K0181
m-Xylene & p-Xylene	24.2		ppbv	0.800	2.00	21.8	111%	50 - 150	VMSC	11/21/12 11:16	12K0181
Bromoform	**25.8**	**L1**	**ppbv**	**0.400**	**2.00**	**10.9**	**237%**	**50 - 150**	**VMSC**	**11/21/12 11:16**	**12K0181**
Styrene	12.0		ppbv	0.400	2.00	11.2	107%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,1,2,2-Tetrachloroethane	12.6		ppbv	0.400	2.00	11.2	112%	50 - 150	VMSC	11/21/12 11:16	12K0181
o-Xylene	12.4		ppbv	0.400	2.00	11.2	111%	50 - 150	VMSC	11/21/12 11:16	12K0181
Xylenes, total	36.6		ppbv	1.20	2.00	33.0	111%	50 - 150	VMSC	11/21/12 11:16	12K0181
n-Nonane	13.6		ppbv	0.400	2.00	10.9	125%	50 - 150	VMSC	11/21/12 11:16	12K0181
Isopropylbenzene	12.3		ppbv	0.400	2.00	10.8	114%	50 - 150	VMSC	11/21/12 11:16	12K0181
2 & 3-Chlorotoluene	11.7		ppbv	0.800	2.00	10.9	108%	50 - 150	VMSC	11/21/12 11:16	12K0181
n-Propylbenzene	12.4		ppbv	0.400	2.00	10.7	116%	50 - 150	VMSC	11/21/12 11:16	12K0181
4-Ethyltoluene	16.1		ppbv	0.400	2.00	11.4	141%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,3,5-Trimethylbenzene	14.0		ppbv	0.400	2.00	11.0	127%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,2,4-Trimethylbenzene	**16.9**	**L1**	**ppbv**	**0.400**	**2.00**	**10.8**	**157%**	**50 - 150**	**VMSC**	**11/21/12 11:16**	**12K0181**
tert-Butylbenzene	15.5		ppbv	0.400	2.00	10.8	144%	50 - 150	VMSC	11/21/12 11:16	12K0181

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Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0181-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Benzyl chloride	**28.9**	**L1**	**ppbv**	**0.400**	**2.00**	**11.2**	**258%**	**50 - 150**	**VMSC**	**11/21/12 11:16**	**12K0181**
1,3-Dichlorobenzene	13.5		ppbv	0.400	2.00	11.2	121%	50 - 150	VMSC	11/21/12 11:16	12K0181
n-Decane	**16.8**	**L1**	**ppbv**	**0.400**	**2.00**	**11.0**	**153%**	**50 - 150**	**VMSC**	**11/21/12 11:16**	**12K0181**
1,4-Dichlorobenzene	14.5		ppbv	0.400	2.00	11.0	132%	50 - 150	VMSC	11/21/12 11:16	12K0181
4-Isopropyltoluene	15.3		ppbv	0.400	2.00	10.7	143%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,2-Dichlorobenzene	14.2		ppbv	0.400	2.00	11.1	128%	50 - 150	VMSC	11/21/12 11:16	12K0181
n-Butylbenzene	14.1		ppbv	0.400	2.00	10.7	132%	50 - 150	VMSC	11/21/12 11:16	12K0181
n-Undecane	14.2		ppbv	0.400	2.00	10.9	131%	50 - 150	VMSC	11/21/12 11:16	12K0181
1,2,4-Trichlorobenzene	**17.5**	**L1, B**	**ppbv**	**0.400**	**2.00**	**11.1**	**158%**	**50 - 150**	**VMSC**	**11/21/12 11:16**	**12K0181**
Naphthalene	13.4	B	ppbv	0.400	2.00	10.5	128%	50 - 150	VMSC	11/21/12 11:16	12K0181
Hexachlorobutadiene	**17.1**	**L1**	**ppbv**	**0.400**	**2.00**	**11.0**	**155%**	**50 - 150**	**VMSC**	**11/21/12 11:16**	**12K0181**
1,2-Dichloroethene, Total	22.4		ppbv	0.800	2.00	22.0	102%	50 - 150	VMSC	11/21/12 11:16	12K0181
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*96%*								VMSC	11/21/12 11:16	12K0181
Surr: Fluorobenzene (46-118%)	*90%*								VMSC	11/21/12 11:16	12K0181
Surr: Toluene-d8 (70-136%)	*97%*								VMSC	11/21/12 11:16	12K0181
Surr: 1,4-Dichlorobutane (38-135%)	*108%*								VMSC	11/21/12 11:16	12K0181
Surr: 4-Bromofluorobenzene (51-128%)	*98%*								VMSC	11/21/12 11:16	12K0181
Sample ID: 12K0235-BS1 (LCS - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Ethene	10.8		ppbv	0.800	4.00	11.1	97%	50 - 150	VMSC	11/30/12 12:23	12K0235
Acetylene	12.1		ppbv	0.800	4.00	11.1	109%	50 - 150	VMSC	11/30/12 12:23	12K0235
Ethane	10.2		ppbv	0.800	4.00	11.1	92%	50 - 150	VMSC	11/30/12 12:23	12K0235
Propylene	11.1		ppbv	0.800	4.00	10.7	104%	50 - 150	VMSC	11/30/12 12:23	12K0235
Chlorodifluoromethane	12.0		ppbv	0.800	4.00	10.7	113%	50 - 150	VMSC	11/30/12 12:23	12K0235
Propane	11.1		ppbv	0.800	4.00	10.6	105%	50 - 150	VMSC	11/30/12 12:23	12K0235
Dichlorodifluoromethane	10.7		ppbv	0.800	4.00	10.6	102%	50 - 150	VMSC	11/30/12 12:23	12K0235
Chloromethane	11.7		ppbv	0.800	4.00	10.8	109%	50 - 150	VMSC	11/30/12 12:23	12K0235
Isobutane	10.9		ppbv	0.800	4.00	10.6	103%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,2-Dichloro-1,1,2,2-tetrafluoroethane	9.04		ppbv	0.800	4.00	10.7	85%	50 - 150	VMSC	11/30/12 12:23	12K0235
Vinyl chloride	10.0		ppbv	0.800	4.00	10.7	94%	50 - 150	VMSC	11/30/12 12:23	12K0235
1-Butene/Isobutene	11.3		ppbv	0.800	4.00	10.5	108%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,3-Butadiene	12.2		ppbv	0.800	4.00	10.9	113%	50 - 150	VMSC	11/30/12 12:23	12K0235
Butane	11.0		ppbv	0.800	4.00	10.6	105%	50 - 150	VMSC	11/30/12 12:23	12K0235

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Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0235-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
trans-2-Butene	11.8		ppbv	0.800	4.00	10.3	114%	50 - 150	VMSC	11/30/12 12:23	12K0235
Bromomethane	11.2		ppbv	0.800	4.00	10.6	106%	50 - 150	VMSC	11/30/12 12:23	12K0235
cis-2-Butene	12.8		ppbv	0.800	4.00	11.2	114%	50 - 150	VMSC	11/30/12 12:23	12K0235
Chloroethane	10.6		ppbv	0.800	4.00	10.5	101%	50 - 150	VMSC	11/30/12 12:23	12K0235
Vinyl bromide	11.2		ppbv	0.800	4.00	10.8	104%	50 - 150	VMSC	11/30/12 12:23	12K0235
3-Methyl-1-butene	12.4		ppbv	0.800	4.00	10.9	114%	50 - 150	VMSC	11/30/12 12:23	12K0235
Acetonitrile	10.9		ppbv	0.800	4.00	10.5	104%	50 - 150	VMSC	11/30/12 12:23	12K0235
Isopentane	11.4		ppbv	0.800	4.00	11.1	103%	50 - 150	VMSC	11/30/12 12:23	12K0235
Trichlorofluoromethane	12.4		ppbv	0.800	4.00	11.1	112%	50 - 150	VMSC	11/30/12 12:23	12K0235
1-Pentene	11.8		ppbv	0.800	4.00	11.5	103%	50 - 150	VMSC	11/30/12 12:23	12K0235
Acetone	10.2	B	ppbv	0.800	4.00	11.1	92%	50 - 150	VMSC	11/30/12 12:23	12K0235
Acrylonitrile	10.4		ppbv	0.800	4.00	11.1	93%	50 - 150	VMSC	11/30/12 12:23	12K0235
n-Pentane	13.3		ppbv	0.800	4.00	11.1	120%	50 - 150	VMSC	11/30/12 12:23	12K0235
Diethyl ether	9.07		ppbv	0.800	4.00	11.0	83%	50 - 150	VMSC	11/30/12 12:23	12K0235
Isoprene	9.56		ppbv	0.800	4.00	11.0	87%	50 - 150	VMSC	11/30/12 12:23	12K0235
trans-2-Pentene	10.9		ppbv	0.800	4.00	11.2	97%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,1-Dichloroethene	12.0		ppbv	0.800	4.00	11.2	107%	50 - 150	VMSC	11/30/12 12:23	12K0235
cis-2-Pentene	10.8		ppbv	0.800	4.00	11.3	96%	50 - 150	VMSC	11/30/12 12:23	12K0235
Methylene chloride	11.9		ppbv	0.800	4.00	10.9	110%	50 - 150	VMSC	11/30/12 12:23	12K0235
2-Methyl-2-butene	11.1		ppbv	0.800	4.00	11.7	94%	50 - 150	VMSC	11/30/12 12:23	12K0235
Carbon disulfide	9.65		ppbv	0.800	4.00	11.1	87%	50 - 150	VMSC	11/30/12 12:23	12K0235
Allyl chloride	12.6		ppbv	0.800	4.00	10.9	116%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,1,2-Trichlorotrifluoroethane	12.4		ppbv	0.800	4.00	11.2	111%	50 - 150	VMSC	11/30/12 12:23	12K0235
trans-1,2-Dichloroethene	9.96		ppbv	0.800	4.00	11.0	91%	50 - 150	VMSC	11/30/12 12:23	12K0235
4-Methyl-1-pentene	11.6		ppbv	0.800	4.00	11.0	106%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,1-Dichloroethane	10.2		ppbv	0.800	4.00	11.0	93%	50 - 150	VMSC	11/30/12 12:23	12K0235
Methyl tert-Butyl Ether	9.95		ppbv	0.800	4.00	11.1	90%	50 - 150	VMSC	11/30/12 12:23	12K0235
Vinyl acetate	11.4		ppbv	0.800	4.00	11.4	100%	50 - 150	VMSC	11/30/12 12:23	12K0235
2-Butanone (MEK)	9.83		ppbv	0.800	4.00	11.4	86%	50 - 150	VMSC	11/30/12 12:23	12K0235
Chloroprene	10.1		ppbv	0.800	4.00	11.0	92%	50 - 150	VMSC	11/30/12 12:23	12K0235
cis-1,2-Dichloroethene	10.0		ppbv	0.800	4.00	11.2	89%	50 - 150	VMSC	11/30/12 12:23	12K0235
Hexane	10.1		ppbv	0.800	4.00	11.6	87%	50 - 150	VMSC	11/30/12 12:23	12K0235
Chloroform	9.95		ppbv	0.800	4.00	10.8	92%	50 - 150	VMSC	11/30/12 12:23	12K0235
trans-2-Hexene	10.2		ppbv	0.800	4.00	11.4	90%	50 - 150	VMSC	11/30/12 12:23	12K0235
cis-2-Hexene	9.52		ppbv	0.800	4.00	10.9	88%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,2-Dichloroethane	10.4		ppbv	0.800	4.00	11.0	95%	50 - 150	VMSC	11/30/12 12:23	12K0235

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PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0235-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
1,1,1-Trichloroethane	11.9		ppbv	0.800	4.00	11.0	109%	50 - 150	VMSC	11/30/12 12:23	12K0235
Benzene	9.12		ppbv	0.800	4.00	11.0	83%	50 - 150	VMSC	11/30/12 12:23	12K0235
Carbon tetrachloride	16.6		ppbv	0.800	4.00	12.1	138%	50 - 150	VMSC	11/30/12 12:23	12K0235
Cyclohexane	11.4		ppbv	0.800	4.00	11.2	101%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,2-Dichloropropane	9.66		ppbv	0.800	4.00	11.1	87%	50 - 150	VMSC	11/30/12 12:23	12K0235
Bromodichloromethane	11.3		ppbv	0.800	4.00	11.2	101%	50 - 150	VMSC	11/30/12 12:23	12K0235
Trichloroethene	10.2		ppbv	0.800	4.00	11.2	91%	50 - 150	VMSC	11/30/12 12:23	12K0235
2,2,4-Trimethylpentane	10.9		ppbv	0.800	4.00	11.1	98%	50 - 150	VMSC	11/30/12 12:23	12K0235
Heptane	8.61		ppbv	0.800	4.00	11.3	76%	50 - 150	VMSC	11/30/12 12:23	12K0235
cis-1,3-Dichloropropene	9.54		ppbv	0.800	4.00	11.3	84%	50 - 150	VMSC	11/30/12 12:23	12K0235
4-Methyl-2-pentanone (MIBK)	9.98		ppbv	0.800	4.00	11.5	87%	50 - 150	VMSC	11/30/12 12:23	12K0235
trans-1,3-Dichloropropene	9.07		ppbv	0.800	4.00	10.5	87%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,1,2-Trichloroethane	9.70		ppbv	0.800	4.00	11.2	87%	50 - 150	VMSC	11/30/12 12:23	12K0235
Toluene	9.43		ppbv	0.800	4.00	11.2	84%	50 - 150	VMSC	11/30/12 12:23	12K0235
2-Hexanone	9.77	B	ppbv	0.800	4.00	11.7	83%	50 - 150	VMSC	11/30/12 12:23	12K0235
Chlorodibromomethane	13.6		ppbv	0.800	4.00	11.8	115%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,2-Dibromoethane (EDB)	9.98		ppbv	0.800	4.00	11.2	89%	50 - 150	VMSC	11/30/12 12:23	12K0235
n-Octane	10.1		ppbv	0.800	4.00	11.1	91%	50 - 150	VMSC	11/30/12 12:23	12K0235
Tetrachloroethene	10.4		ppbv	0.800	4.00	10.5	100%	50 - 150	VMSC	11/30/12 12:23	12K0235
Chlorobenzene	9.88		ppbv	0.800	4.00	11.3	87%	50 - 150	VMSC	11/30/12 12:23	12K0235
Ethylbenzene	9.13		ppbv	0.800	4.00	11.2	82%	50 - 150	VMSC	11/30/12 12:23	12K0235
m-Xylene & p-Xylene	19.1		ppbv	1.60	4.00	22.0	87%	50 - 150	VMSC	11/30/12 12:23	12K0235
Bromoform	**21.4**	**L1**	**ppbv**	**0.800**	**4.00**	**11.0**	**195%**	**50 - 150**	**VMSC**	**11/30/12 12:23**	**12K0235**
Styrene	8.65		ppbv	0.800	4.00	11.3	77%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,1,2,2-Tetrachloroethane	9.92		ppbv	0.800	4.00	11.3	88%	50 - 150	VMSC	11/30/12 12:23	12K0235
o-Xylene	9.99		ppbv	0.800	4.00	11.3	88%	50 - 150	VMSC	11/30/12 12:23	12K0235
Xylenes, total	29.1		ppbv	2.40	4.00	33.3	88%	50 - 150	VMSC	11/30/12 12:23	12K0235
n-Nonane	10.0		ppbv	0.800	4.00	11.0	91%	50 - 150	VMSC	11/30/12 12:23	12K0235
Isopropylbenzene	9.80		ppbv	0.800	4.00	10.9	90%	50 - 150	VMSC	11/30/12 12:23	12K0235
2 & 3-Chlorotoluene	8.92		ppbv	1.60	4.00	11.0	81%	50 - 150	VMSC	11/30/12 12:23	12K0235
n-Propylbenzene	8.88		ppbv	0.800	4.00	10.8	82%	50 - 150	VMSC	11/30/12 12:23	12K0235
4-Ethyltoluene	11.0		ppbv	0.800	4.00	11.5	95%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,3,5-Trimethylbenzene	10.3		ppbv	0.800	4.00	11.1	93%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,2,4-Trimethylbenzene	11.7		ppbv	0.800	4.00	10.9	108%	50 - 150	VMSC	11/30/12 12:23	12K0235
tert-Butylbenzene	11.7		ppbv	0.800	4.00	10.9	108%	50 - 150	VMSC	11/30/12 12:23	12K0235
Benzyl chloride	**18.7**	**L1**	**ppbv**	**0.800**	**4.00**	**11.3**	**166%**	**50 - 150**	**VMSC**	**11/30/12 12:23**	**12K0235**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
14050 Summit Drive, Suite A100 Austin, TX 78728 * 512-244-0855 * Fax 512-244-0160

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PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 12K0235-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
1,3-Dichlorobenzene	9.39	B	ppbv	0.800	4.00	11.3	83%	50 - 150	VMSC	11/30/12 12:23	12K0235
n-Decane	11.1		ppbv	0.800	4.00	11.1	100%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,4-Dichlorobenzene	9.70	B	ppbv	0.800	4.00	11.1	88%	50 - 150	VMSC	11/30/12 12:23	12K0235
4-Isopropyltoluene	10.4		ppbv	0.800	4.00	10.8	97%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,2-Dichlorobenzene	10.2	B	ppbv	0.800	4.00	11.2	91%	50 - 150	VMSC	11/30/12 12:23	12K0235
n-Butylbenzene	8.88	B	ppbv	0.800	4.00	10.8	82%	50 - 150	VMSC	11/30/12 12:23	12K0235
n-Undecane	8.52		ppbv	0.800	4.00	11.0	78%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,2,4-Trichlorobenzene	11.6	B	ppbv	0.800	4.00	11.2	104%	50 - 150	VMSC	11/30/12 12:23	12K0235
Naphthalene	8.81	B	ppbv	0.800	4.00	10.6	83%	50 - 150	VMSC	11/30/12 12:23	12K0235
Hexachlorobutadiene	11.3		ppbv	0.800	4.00	11.1	102%	50 - 150	VMSC	11/30/12 12:23	12K0235
1,2-Dichloroethene, Total	20.0		ppbv	1.60	4.00	22.2	90%	50 - 150	VMSC	11/30/12 12:23	12K0235
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*100%*								VMSC	11/30/12 12:23	12K0235
Surr: Fluorobenzene (46-118%)	*98%*								VMSC	11/30/12 12:23	12K0235
Surr: Toluene-d8 (70-136%)	*97%*								VMSC	11/30/12 12:23	12K0235
Surr: 1,4-Dichlorobutane (38-135%)	*97%*								VMSC	11/30/12 12:23	12K0235
Surr: 4-Bromofluorobenzene (51-128%)	*90%*								VMSC	11/30/12 12:23	12K0235

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PROJECT QUALITY CONTROL DATA

LCS Dup

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	Limit	Date Analyzed	QC Batch
Sample ID: 12K0154-BSD1 (LCS Dup - Air)												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Propylene	10.5		ppbv	0.400	2.00	10.6	99%	50 - 150	3	25	11/19/12 12:27	12K0154
Chlorodifluoromethane	10.5		ppbv	0.400	2.00	10.6	99%	50 - 150	2	25	11/19/12 12:27	12K0154
Propane	10.2		ppbv	0.400	2.00	10.5	97%	50 - 150	4	25	11/19/12 12:27	12K0154
Dichlorodifluoromethane	10.6		ppbv	0.400	2.00	10.5	101%	50 - 150	3	25	11/19/12 12:27	12K0154
Chloromethane	11.0		ppbv	0.400	2.00	10.7	103%	50 - 150	3	25	11/19/12 12:27	12K0154
Isobutane	10.2		ppbv	0.400	2.00	10.5	97%	50 - 150	2	25	11/19/12 12:27	12K0154
1,2-Dichloro-1,1,2,2-tetrafluoroethane	9.47		ppbv	0.400	2.00	10.6	89%	50 - 150	2	25	11/19/12 12:27	12K0154
Vinyl chloride	10.9		ppbv	0.400	2.00	10.6	103%	50 - 150	2	25	11/19/12 12:27	12K0154
1-Butene/Isobutene	10.4		ppbv	0.400	2.00	10.4	100%	50 - 150	1	25	11/19/12 12:27	12K0154
1,3-Butadiene	11.5		ppbv	0.400	2.00	10.8	107%	50 - 150	0.5	25	11/19/12 12:27	12K0154
Butane	10.3		ppbv	0.400	2.00	10.5	98%	50 - 150	3	25	11/19/12 12:27	12K0154
Methanol	11.8	B	ppbv	0.400	2.00	10.8	109%	50 - 150	4	50	11/19/12 12:27	12K0154
trans-2-Butene	10.6		ppbv	0.400	2.00	10.3	103%	50 - 150	1	25	11/19/12 12:27	12K0154
Bromomethane	11.2		ppbv	0.400	2.00	10.5	106%	50 - 150	2	25	11/19/12 12:27	12K0154
cis-2-Butene	11.6		ppbv	0.400	2.00	11.1	104%	50 - 150	0.8	25	11/19/12 12:27	12K0154
Chloroethane	11.2		ppbv	0.400	2.00	10.4	108%	50 - 150	1	25	11/19/12 12:27	12K0154
Vinyl bromide	10.6		ppbv	0.400	2.00	10.7	99%	50 - 150	2	25	11/19/12 12:27	12K0154
3-Methyl-1-butene	12.1		ppbv	0.400	2.00	10.8	112%	50 - 150	2	25	11/19/12 12:27	12K0154
Acetonitrile	10.9		ppbv	0.400	2.00	10.4	105%	50 - 150	2	25	11/19/12 12:27	12K0154
Isopentane	10.8		ppbv	0.400	2.00	11.0	98%	50 - 150	1	25	11/19/12 12:27	12K0154
Trichlorofluoromethane	11.5		ppbv	0.400	2.00	11.0	104%	50 - 150	1	25	11/19/12 12:27	12K0154
1-Pentene	12.4		ppbv	0.400	2.00	11.4	108%	50 - 150	1	25	11/19/12 12:27	12K0154
Acetone	11.6	B	ppbv	0.400	2.00	11.0	105%	50 - 150	3	25	11/19/12 12:27	12K0154
Isopropyl alcohol	12.1		ppbv	0.400	2.00	12.0	101%	50 - 150	5	50	11/19/12 12:27	12K0154
Acrylonitrile	12.2		ppbv	0.400	2.00	11.0	111%	50 - 150	2	25	11/19/12 12:27	12K0154
n-Pentane	11.9		ppbv	0.400	2.00	11.0	108%	50 - 150	1	25	11/19/12 12:27	12K0154
Diethyl ether	12.5		ppbv	0.400	2.00	10.9	114%	50 - 150	4	25	11/19/12 12:27	12K0154
Isoprene	12.1		ppbv	0.400	2.00	10.9	111%	50 - 150	1	25	11/19/12 12:27	12K0154
trans-2-Pentene	12.0		ppbv	0.400	2.00	11.1	108%	50 - 150	1	25	11/19/12 12:27	12K0154
1,1-Dichloroethene	11.6		ppbv	0.400	2.00	11.1	105%	50 - 150	1	25	11/19/12 12:27	12K0154
cis-2-Pentene	12.1		ppbv	0.400	2.00	11.2	108%	50 - 150	1	25	11/19/12 12:27	12K0154
Methylene chloride	11.8		ppbv	0.400	2.00	10.8	109%	50 - 150	2	25	11/19/12 12:27	12K0154
2-Methyl-2-butene	12.2		ppbv	0.400	2.00	11.7	105%	50 - 150	1	25	11/19/12 12:27	12K0154
Carbon disulfide	9.34		ppbv	0.400	2.00	11.0	85%	50 - 150	2	25	11/19/12 12:27	12K0154
Allyl chloride	12.2		ppbv	0.400	2.00	10.8	113%	50 - 150	1	25	11/19/12 12:27	12K0154
1,1,2-Trichlorotrifluoroethane	11.9		ppbv	0.400	2.00	11.1	107%	50 - 150	2	25	11/19/12 12:27	12K0154

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Received: 11/15/12 08:30
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PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	RPD Limit	Date Analyzed	QC Batch
Sample ID: 12K0154-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
trans-1,2-Dichloroethene	10.6		ppbv	0.400	2.00	10.9	98%	50 - 150	2	25	11/19/12 12:27	12K0154
4-Methyl-1-pentene	11.6		ppbv	0.400	2.00	10.9	106%	50 - 150	2	25	11/19/12 12:27	12K0154
1,1-Dichloroethane	11.6		ppbv	0.400	2.00	10.9	106%	50 - 150	2	25	11/19/12 12:27	12K0154
Methyl tert-Butyl Ether	12.6		ppbv	0.400	2.00	11.0	114%	50 - 150	1	25	11/19/12 12:27	12K0154
Vinyl acetate	11.2		ppbv	0.400	2.00	11.3	99%	50 - 150	1	50	11/19/12 12:27	12K0154
2-Butanone (MEK)	10.4		ppbv	0.400	2.00	11.3	91%	50 - 150	1	25	11/19/12 12:27	12K0154
Chloroprene	10.6		ppbv	0.400	2.00	10.9	97%	50 - 150	3	25	11/19/12 12:27	12K0154
cis-1,2-Dichloroethene	11.5		ppbv	0.400	2.00	11.1	103%	50 - 150	3	25	11/19/12 12:27	12K0154
Hexane	11.2		ppbv	0.400	2.00	11.5	97%	50 - 150	2	25	11/19/12 12:27	12K0154
Chloroform	11.7		ppbv	0.400	2.00	10.7	109%	50 - 150	3	25	11/19/12 12:27	12K0154
trans-2-Hexene	12.0		ppbv	0.400	2.00	11.3	106%	50 - 150	2	25	11/19/12 12:27	12K0154
cis-2-Hexene	11.0		ppbv	0.400	2.00	10.8	101%	50 - 150	2	25	11/19/12 12:27	12K0154
1,2-Dichloroethane	12.0		ppbv	0.400	2.00	10.9	110%	50 - 150	2	25	11/19/12 12:27	12K0154
1,1,1-Trichloroethane	11.8		ppbv	0.400	2.00	10.9	108%	50 - 150	2	25	11/19/12 12:27	12K0154
Benzene	12.6		ppbv	0.400	2.00	10.9	115%	50 - 150	3	25	11/19/12 12:27	12K0154
Carbon tetrachloride	12.9		ppbv	0.400	2.00	12.0	108%	50 - 150	3	25	11/19/12 12:27	12K0154
n-Butanol	9.08		ppbv	0.400	2.00	12.0	76%	50 - 150	9	50	11/19/12 12:27	12K0154
Cyclohexane	10.8		ppbv	0.400	2.00	11.1	97%	50 - 150	3	25	11/19/12 12:27	12K0154
1,2-Dichloropropane	13.2		ppbv	0.400	2.00	11.0	120%	50 - 150	3	25	11/19/12 12:27	12K0154
Bromodichloromethane	13.2		ppbv	0.400	2.00	11.1	119%	50 - 150	3	25	11/19/12 12:27	12K0154
Trichloroethene	11.4		ppbv	0.400	2.00	11.1	102%	50 - 150	2	25	11/19/12 12:27	12K0154
1,4-Dioxane	12.1		ppbv	0.400	2.00	11.1	109%	50 - 150	0.7	50	11/19/12 12:27	12K0154
2,2,4-Trimethylpentane	11.5		ppbv	0.400	2.00	11.0	104%	50 - 150	3	25	11/19/12 12:27	12K0154
Heptane	11.6		ppbv	0.400	2.00	11.2	103%	50 - 150	2	25	11/19/12 12:27	12K0154
cis-1,3-Dichloropropene	13.6		ppbv	0.400	2.00	11.2	121%	50 - 150	4	25	11/19/12 12:27	12K0154
4-Methyl-2-pentanone (MIBK)	9.95		ppbv	0.400	2.00	11.4	87%	50 - 150	2	25	11/19/12 12:27	12K0154
trans-1,3-Dichloropropene	13.1		ppbv	0.400	2.00	10.4	126%	50 - 150	2	25	11/19/12 12:27	12K0154
1,1,2-Trichloroethane	13.5		ppbv	0.400	2.00	11.1	121%	50 - 150	3	25	11/19/12 12:27	12K0154
Toluene	13.5		ppbv	0.400	2.00	11.1	122%	50 - 150	3	25	11/19/12 12:27	12K0154
2-Hexanone	10.9		ppbv	0.400	2.00	11.7	93%	50 - 150	0.7	25	11/19/12 12:27	12K0154
Chlorodibromomethane	14.8		ppbv	0.400	2.00	11.8	126%	50 - 150	3	25	11/19/12 12:27	12K0154
1,2-Dibromoethane (EDB)	13.7		ppbv	0.400	2.00	11.1	123%	50 - 150	2	25	11/19/12 12:27	12K0154
n-Octane	12.2		ppbv	0.400	2.00	11.0	111%	50 - 150	2	25	11/19/12 12:27	12K0154
Tetrachloroethene	12.7		ppbv	0.400	2.00	10.4	122%	50 - 150	2	25	11/19/12 12:27	12K0154
Chlorobenzene	13.9		ppbv	0.400	2.00	11.2	124%	50 - 150	3	25	11/19/12 12:27	12K0154
Ethylbenzene	14.1		ppbv	0.400	2.00	11.1	126%	50 - 150	3	25	11/19/12 12:27	12K0154

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	Limit	Date Analyzed	QC Batch
Sample ID: 12K0154-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
m-Xylene & p-Xylene	28.1		ppbv	0.800	2.00	21.8	129%	50 - 150	3	25	11/19/12 12:27	12K0154
Bromoform	**16.5**	**L1**	**ppbv**	**0.400**	**2.00**	**10.9**	**151%**	**50 - 150**	**4**	**25**	**11/19/12 12:27**	**12K0154**
Styrene	14.3		ppbv	0.400	2.00	11.2	127%	50 - 150	4	25	11/19/12 12:27	12K0154
1,1,2,2-Tetrachloroethane	14.2		ppbv	0.400	2.00	11.2	127%	50 - 150	4	25	11/19/12 12:27	12K0154
o-Xylene	14.0		ppbv	0.400	2.00	11.2	125%	50 - 150	3	25	11/19/12 12:27	12K0154
Xylenes, total	42.2		ppbv	1.20	2.00	33.0	128%	50 - 150	3	25	11/19/12 12:27	12K0154
n-Nonane	12.9		ppbv	0.400	2.00	10.9	118%	50 - 150	4	25	11/19/12 12:27	12K0154
Isopropylbenzene	13.3		ppbv	0.400	2.00	10.8	123%	50 - 150	3	50	11/19/12 12:27	12K0154
2 & 3-Chlorotoluene	12.8		ppbv	0.800	2.00	10.9	117%	50 - 150	3	25	11/19/12 12:27	12K0154
n-Propylbenzene	13.9		ppbv	0.400	2.00	10.7	129%	50 - 150	2	25	11/19/12 12:27	12K0154
4-Ethyltoluene	14.8		ppbv	0.400	2.00	11.4	130%	50 - 150	2	25	11/19/12 12:27	12K0154
1,3,5-Trimethylbenzene	13.6		ppbv	0.400	2.00	11.0	124%	50 - 150	2	25	11/19/12 12:27	12K0154
1,2-Dichloroethene, Total	22.1		ppbv	0.800	2.00	22.0	100%	50 - 150	3	25	11/19/12 12:27	12K0154
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*100%*										11/19/12 12:27	12K0154
Surr: Fluorobenzene (46-118%)	*98%*										11/19/12 12:27	12K0154
Surr: Toluene-d8 (70-136%)	*96%*										11/19/12 12:27	12K0154
Surr: 1,4-Dichlorobutane (38-135%)	*106%*										11/19/12 12:27	12K0154
Surr: 4-Bromofluorobenzene (51-128%)	*102%*										11/19/12 12:27	12K0154
Sample ID: 12K0167-BSD1 (LCS Dup - Air)												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Propylene	11.0		ppbv	0.400	2.00	10.6	104%	50 - 150	7	25	11/20/12 12:53	12K0167
Chlorodifluoromethane	10.9		ppbv	0.400	2.00	10.6	103%	50 - 150	7	25	11/20/12 12:53	12K0167
Propane	10.6		ppbv	0.400	2.00	10.5	101%	50 - 150	6	25	11/20/12 12:53	12K0167
Dichlorodifluoromethane	10.8		ppbv	0.400	2.00	10.5	103%	50 - 150	6	25	11/20/12 12:53	12K0167
Chloromethane	11.3		ppbv	0.400	2.00	10.7	106%	50 - 150	5	25	11/20/12 12:53	12K0167
Isobutane	10.5		ppbv	0.400	2.00	10.5	100%	50 - 150	6	25	11/20/12 12:53	12K0167
1,2-Dichloro-1,1,2,2-tetrafluoroethane	9.60		ppbv	0.400	2.00	10.6	91%	50 - 150	7	25	11/20/12 12:53	12K0167
Vinyl chloride	11.1		ppbv	0.400	2.00	10.6	105%	50 - 150	7	25	11/20/12 12:53	12K0167
1-Butene/Isobutene	10.8		ppbv	0.400	2.00	10.4	104%	50 - 150	7	25	11/20/12 12:53	12K0167
1,3-Butadiene	11.9		ppbv	0.400	2.00	10.8	110%	50 - 150	7	25	11/20/12 12:53	12K0167
Butane	10.6		ppbv	0.400	2.00	10.5	101%	50 - 150	6	25	11/20/12 12:53	12K0167
Methanol	12.3		ppbv	0.400	2.00	10.8	114%	50 - 150	7	50	11/20/12 12:53	12K0167
trans-2-Butene	11.0		ppbv	0.400	2.00	10.3	107%	50 - 150	7	25	11/20/12 12:53	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	RPD Limit	Date Analyzed	QC Batch
Sample ID: 12K0167-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Bromomethane	11.3		ppbv	0.400	2.00	10.5	108%	50 - 150	8	25	11/20/12 12:53	12K0167
cis-2-Butene	12.0		ppbv	0.400	2.00	11.1	108%	50 - 150	7	25	11/20/12 12:53	12K0167
Chloroethane	11.4		ppbv	0.400	2.00	10.4	110%	50 - 150	7	25	11/20/12 12:53	12K0167
Vinyl bromide	10.6		ppbv	0.400	2.00	10.7	99%	50 - 150	6	25	11/20/12 12:53	12K0167
3-Methyl-1-butene	12.4		ppbv	0.400	2.00	10.8	115%	50 - 150	6	25	11/20/12 12:53	12K0167
Acetonitrile	11.4		ppbv	0.400	2.00	10.4	110%	50 - 150	6	25	11/20/12 12:53	12K0167
Isopentane	11.3		ppbv	0.400	2.00	11.0	103%	50 - 150	6	25	11/20/12 12:53	12K0167
Trichlorofluoromethane	11.8		ppbv	0.400	2.00	11.0	107%	50 - 150	7	25	11/20/12 12:53	12K0167
1-Pentene	13.0		ppbv	0.400	2.00	11.4	114%	50 - 150	7	25	11/20/12 12:53	12K0167
Acetone	12.1	B	ppbv	0.400	2.00	11.0	110%	50 - 150	6	25	11/20/12 12:53	12K0167
Isopropyl alcohol	12.6		ppbv	0.400	2.00	12.0	105%	50 - 150	7	50	11/20/12 12:53	12K0167
Acrylonitrile	12.6		ppbv	0.400	2.00	11.0	114%	50 - 150	5	25	11/20/12 12:53	12K0167
n-Pentane	12.5		ppbv	0.400	2.00	11.0	113%	50 - 150	8	25	11/20/12 12:53	12K0167
Diethyl ether	12.8		ppbv	0.400	2.00	10.9	117%	50 - 150	6	25	11/20/12 12:53	12K0167
Isoprene	12.4		ppbv	0.400	2.00	10.9	114%	50 - 150	7	25	11/20/12 12:53	12K0167
trans-2-Pentene	12.4		ppbv	0.400	2.00	11.1	112%	50 - 150	7	25	11/20/12 12:53	12K0167
1,1-Dichloroethene	12.2		ppbv	0.400	2.00	11.1	109%	50 - 150	8	25	11/20/12 12:53	12K0167
cis-2-Pentene	12.4		ppbv	0.400	2.00	11.2	110%	50 - 150	7	25	11/20/12 12:53	12K0167
Methylene chloride	12.2		ppbv	0.400	2.00	10.8	113%	50 - 150	6	25	11/20/12 12:53	12K0167
2-Methyl-2-butene	12.6		ppbv	0.400	2.00	11.7	108%	50 - 150	7	25	11/20/12 12:53	12K0167
Carbon disulfide	9.62		ppbv	0.400	2.00	11.0	87%	50 - 150	7	25	11/20/12 12:53	12K0167
Allyl chloride	12.7		ppbv	0.400	2.00	10.8	118%	50 - 150	7	25	11/20/12 12:53	12K0167
1,1,2-Trichlorotrifluoroethane	12.3		ppbv	0.400	2.00	11.1	110%	50 - 150	7	25	11/20/12 12:53	12K0167
trans-1,2-Dichloroethene	10.8		ppbv	0.400	2.00	10.9	99%	50 - 150	7	25	11/20/12 12:53	12K0167
4-Methyl-1-pentene	12.0		ppbv	0.400	2.00	10.9	110%	50 - 150	7	25	11/20/12 12:53	12K0167
1,1-Dichloroethane	11.6		ppbv	0.400	2.00	10.9	107%	50 - 150	7	25	11/20/12 12:53	12K0167
Methyl tert-Butyl Ether	12.6		ppbv	0.400	2.00	11.0	114%	50 - 150	8	25	11/20/12 12:53	12K0167
Vinyl acetate	11.4		ppbv	0.400	2.00	11.3	101%	50 - 150	7	50	11/20/12 12:53	12K0167
2-Butanone (MEK)	10.7		ppbv	0.400	2.00	11.3	94%	50 - 150	8	25	11/20/12 12:53	12K0167
Chloroprene	10.8		ppbv	0.400	2.00	10.9	99%	50 - 150	8	25	11/20/12 12:53	12K0167
cis-1,2-Dichloroethene	11.7		ppbv	0.400	2.00	11.1	105%	50 - 150	7	25	11/20/12 12:53	12K0167
Hexane	11.3		ppbv	0.400	2.00	11.5	98%	50 - 150	7	25	11/20/12 12:53	12K0167
Chloroform	11.7		ppbv	0.400	2.00	10.7	110%	50 - 150	7	25	11/20/12 12:53	12K0167
trans-2-Hexene	12.1		ppbv	0.400	2.00	11.3	107%	50 - 150	8	25	11/20/12 12:53	12K0167
cis-2-Hexene	11.1		ppbv	0.400	2.00	10.8	103%	50 - 150	8	25	11/20/12 12:53	12K0167
1,2-Dichloroethane	12.1		ppbv	0.400	2.00	10.9	111%	50 - 150	7	25	11/20/12 12:53	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	Limit	Date Analyzed	QC Batch
Sample ID: 12K0167-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
1,1,1-Trichloroethane	11.8		ppbv	0.400	2.00	10.9	108%	50 - 150	7	25	11/20/12 12:53	12K0167
Benzene	12.8		ppbv	0.400	2.00	10.9	117%	50 - 150	0.5	25	11/20/12 12:53	12K0167
Carbon tetrachloride	13.2		ppbv	0.400	2.00	12.0	111%	50 - 150	2	25	11/20/12 12:53	12K0167
n-Butanol	9.25		ppbv	0.400	2.00	12.0	77%	50 - 150	2	50	11/20/12 12:53	12K0167
Cyclohexane	11.2		ppbv	0.400	2.00	11.1	101%	50 - 150	1	25	11/20/12 12:53	12K0167
1,2-Dichloropropane	13.7		ppbv	0.400	2.00	11.0	124%	50 - 150	0.8	25	11/20/12 12:53	12K0167
Bromodichloromethane	13.6		ppbv	0.400	2.00	11.1	122%	50 - 150	0.6	25	11/20/12 12:53	12K0167
Trichloroethene	11.6		ppbv	0.400	2.00	11.1	105%	50 - 150	1	25	11/20/12 12:53	12K0167
1,4-Dioxane	12.3		ppbv	0.400	2.00	11.1	111%	50 - 150	2	50	11/20/12 12:53	12K0167
2,2,4-Trimethylpentane	11.9		ppbv	0.400	2.00	11.0	108%	50 - 150	0.4	25	11/20/12 12:53	12K0167
Heptane	11.8		ppbv	0.400	2.00	11.2	105%	50 - 150	0.07	25	11/20/12 12:53	12K0167
cis-1,3-Dichloropropene	14.1		ppbv	0.400	2.00	11.2	126%	50 - 150	2	25	11/20/12 12:53	12K0167
4-Methyl-2-pentanone (MIBK)	10.5		ppbv	0.400	2.00	11.4	92%	50 - 150	2	25	11/20/12 12:53	12K0167
trans-1,3-Dichloropropene	13.5		ppbv	0.400	2.00	10.4	130%	50 - 150	2	25	11/20/12 12:53	12K0167
1,1,2-Trichloroethane	13.8		ppbv	0.400	2.00	11.1	124%	50 - 150	0.8	25	11/20/12 12:53	12K0167
Toluene	14.0		ppbv	0.400	2.00	11.1	126%	50 - 150	1	25	11/20/12 12:53	12K0167
2-Hexanone	11.3		ppbv	0.400	2.00	11.7	97%	50 - 150	3	25	11/20/12 12:53	12K0167
Chlorodibromomethane	15.3		ppbv	0.400	2.00	11.8	130%	50 - 150	2	25	11/20/12 12:53	12K0167
1,2-Dibromoethane (EDB)	14.1		ppbv	0.400	2.00	11.1	127%	50 - 150	2	25	11/20/12 12:53	12K0167
n-Octane	12.9		ppbv	0.400	2.00	11.0	117%	50 - 150	0.5	25	11/20/12 12:53	12K0167
Tetrachloroethene	12.8		ppbv	0.400	2.00	10.4	124%	50 - 150	1	25	11/20/12 12:53	12K0167
Chlorobenzene	14.2		ppbv	0.400	2.00	11.2	127%	50 - 150	1	25	11/20/12 12:53	12K0167
Ethylbenzene	14.5		ppbv	0.400	2.00	11.1	130%	50 - 150	2	25	11/20/12 12:53	12K0167
m-Xylene & p-Xylene	29.1		ppbv	0.800	2.00	21.8	133%	50 - 150	2	25	11/20/12 12:53	12K0167
Bromoform	**16.9**	**L1**	**ppbv**	**0.400**	**2.00**	**10.9**	**155%**	**50 - 150**	**3**	**25**	**11/20/12 12:53**	**12K0167**
Styrene	14.8		ppbv	0.400	2.00	11.2	131%	50 - 150	3	25	11/20/12 12:53	12K0167
1,1,2,2-Tetrachloroethane	14.9		ppbv	0.400	2.00	11.2	132%	50 - 150	2	25	11/20/12 12:53	12K0167
o-Xylene	14.6		ppbv	0.400	2.00	11.2	130%	50 - 150	1	25	11/20/12 12:53	12K0167
Xylenes, total	43.6		ppbv	1.20	2.00	33.0	132%	50 - 150	2	25	11/20/12 12:53	12K0167
n-Nonane	13.8		ppbv	0.400	2.00	10.9	127%	50 - 150	2	25	11/20/12 12:53	12K0167
Isopropylbenzene	13.8		ppbv	0.400	2.00	10.8	128%	50 - 150	1	50	11/20/12 12:53	12K0167
2 & 3-Chlorotoluene	13.2		ppbv	0.800	2.00	10.9	121%	50 - 150	2	25	11/20/12 12:53	12K0167
n-Propylbenzene	14.4		ppbv	0.400	2.00	10.7	134%	50 - 150	2	25	11/20/12 12:53	12K0167
4-Ethyltoluene	15.3		ppbv	0.400	2.00	11.4	134%	50 - 150	3	25	11/20/12 12:53	12K0167
1,3,5-Trimethylbenzene	14.1		ppbv	0.400	2.00	11.0	128%	50 - 150	2	25	11/20/12 12:53	12K0167
1,2,4-Trimethylbenzene	14.8		ppbv	0.400	2.00	10.8	137%	50 - 150	2	25	11/20/12 12:53	12K0167

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	Limit	Date Analyzed	QC Batch
Sample ID: 12K0167-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
tert-Butylbenzene	13.7		ppbv	0.400	2.00	10.8	127%	50 - 150	1	25	11/20/12 12:53	12K0167
Benzyl chloride	**20.5**	**L1**	**ppbv**	**0.400**	**2.00**	**11.2**	**182%**	**50 - 150**	**5**	**25**	**11/20/12 12:53**	**12K0167**
1,3-Dichlorobenzene	14.3		ppbv	0.400	2.00	11.2	128%	50 - 150	3	25	11/20/12 12:53	12K0167
n-Decane	14.4		ppbv	0.400	2.00	11.0	131%	50 - 150	3	25	11/20/12 12:53	12K0167
1,4-Dichlorobenzene	14.6		ppbv	0.400	2.00	11.0	133%	50 - 150	4	25	11/20/12 12:53	12K0167
4-Isopropyltoluene	13.5		ppbv	0.400	2.00	10.7	126%	50 - 150	2	25	11/20/12 12:53	12K0167
1,2-Dichlorobenzene	14.3		ppbv	0.400	2.00	11.1	128%	50 - 150	3	25	11/20/12 12:53	12K0167
n-Butylbenzene	14.2		ppbv	0.400	2.00	10.7	133%	50 - 150	3	25	11/20/12 12:53	12K0167
n-Undecane	11.4		ppbv	0.400	2.00	10.9	105%	50 - 150	2	25	11/20/12 12:53	12K0167
1,2,4-Trichlorobenzene	11.5	B	ppbv	0.400	2.00	11.1	104%	50 - 150	3	25	11/20/12 12:53	12K0167
Naphthalene	10.7		ppbv	0.400	2.00	10.5	102%	50 - 150	4	25	11/20/12 12:53	12K0167
Hexachlorobutadiene	12.0		ppbv	0.400	2.00	11.0	109%	50 - 150	3	25	11/20/12 12:53	12K0167
1,2-Dichloroethene, Total	22.5		ppbv	0.800	2.00	22.0	102%	50 - 150	7	25	11/20/12 12:53	12K0167
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*99%*										11/20/12 12:53	12K0167
Surr: Fluorobenzene (46-118%)	*95%*										11/20/12 12:53	12K0167
Surr: Toluene-d8 (70-136%)	*96%*										11/20/12 12:53	12K0167
Surr: 1,4-Dichlorobutane (38-135%)	*112%*										11/20/12 12:53	12K0167
Surr: 4-Bromofluorobenzene (51-128%)	*104%*										11/20/12 12:53	12K0167
Sample ID: 12K0181-BSD1 (LCS Dup - Air)												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Ethene	9.60		ppbv	0.400	2.00	11.0	87%	50 - 150	10	25	11/21/12 12:15	12K0181
Acetylene	8.03		ppbv	0.400	2.00	11.0	73%	50 - 150	10	25	11/21/12 12:15	12K0181
Ethane	8.92		ppbv	0.400	2.00	11.0	81%	50 - 150	11	25	11/21/12 12:15	12K0181
Propylene	9.86		ppbv	0.400	2.00	10.6	93%	50 - 150	8	25	11/21/12 12:15	12K0181
Chlorodifluoromethane	10.7		ppbv	0.400	2.00	10.6	101%	50 - 150	9	25	11/21/12 12:15	12K0181
Propane	9.67		ppbv	0.400	2.00	10.5	93%	50 - 150	6	25	11/21/12 12:15	12K0181
Dichlorodifluoromethane	9.40		ppbv	0.400	2.00	10.5	90%	50 - 150	15	25	11/21/12 12:15	12K0181
Chloromethane	10.3		ppbv	0.400	2.00	10.7	97%	50 - 150	12	25	11/21/12 12:15	12K0181
Isobutane	9.55		ppbv	0.400	2.00	10.5	91%	50 - 150	10	25	11/21/12 12:15	12K0181
1,2-Dichloro-1,1,2,2-tetrafluoroethane	7.97		ppbv	0.400	2.00	10.6	75%	50 - 150	9	25	11/21/12 12:15	12K0181
Vinyl chloride	8.93		ppbv	0.400	2.00	10.6	85%	50 - 150	10	25	11/21/12 12:15	12K0181
1-Butene/Isobutene	10.0		ppbv	0.400	2.00	10.4	97%	50 - 150	7	25	11/21/12 12:15	12K0181
1,3-Butadiene	11.2		ppbv	0.400	2.00	10.8	104%	50 - 150	6	25	11/21/12 12:15	12K0181

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	RPD Limit	Date Analyzed	QC Batch
Sample ID: 12K0181-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Butane	9.64		ppbv	0.400	2.00	10.5	92%	50 - 150	9	25	11/21/12 12:15	12K0181
trans-2-Butene	10.8		ppbv	0.400	2.00	10.2	106%	50 - 150	5	25	11/21/12 12:15	12K0181
Bromomethane	10.0		ppbv	0.400	2.00	10.5	96%	50 - 150	8	25	11/21/12 12:15	12K0181
cis-2-Butene	12.1		ppbv	0.400	2.00	11.1	109%	50 - 150	4	25	11/21/12 12:15	12K0181
Chloroethane	10.8		ppbv	0.400	2.00	10.4	105%	50 - 150	4	25	11/21/12 12:15	12K0181
Vinyl bromide	10.6		ppbv	0.400	2.00	10.7	100%	50 - 150	0.9	25	11/21/12 12:15	12K0181
3-Methyl-1-butene	11.7		ppbv	0.400	2.00	10.8	109%	50 - 150	2	25	11/21/12 12:15	12K0181
Acetonitrile	8.03		ppbv	0.400	2.00	10.4	78%	50 - 150	16	25	11/21/12 12:15	12K0181
Isopentane	10.3		ppbv	0.400	2.00	11.0	94%	50 - 150	7	25	11/21/12 12:15	12K0181
Trichlorofluoromethane	11.0		ppbv	0.400	2.00	11.0	100%	50 - 150	7	25	11/21/12 12:15	12K0181
1-Pentene	12.6		ppbv	0.400	2.00	11.4	110%	50 - 150	0.07	25	11/21/12 12:15	12K0181
Acetone	9.76	B	ppbv	0.400	2.00	11.0	89%	50 - 150	17	25	11/21/12 12:15	12K0181
Acrylonitrile	11.8		ppbv	0.400	2.00	11.0	107%	50 - 150	6	25	11/21/12 12:15	12K0181
n-Pentane	12.4		ppbv	0.400	2.00	11.0	113%	50 - 150	1	25	11/21/12 12:15	12K0181
Diethyl ether	10.5		ppbv	0.400	2.00	10.9	96%	50 - 150	3	25	11/21/12 12:15	12K0181
Isoprene	10.4		ppbv	0.400	2.00	10.9	95%	50 - 150	0.7	25	11/21/12 12:15	12K0181
trans-2-Pentene	12.0		ppbv	0.400	2.00	11.1	108%	50 - 150	0.6	25	11/21/12 12:15	12K0181
1,1-Dichloroethene	12.0		ppbv	0.400	2.00	11.1	108%	50 - 150	0.8	25	11/21/12 12:15	12K0181
cis-2-Pentene	12.0		ppbv	0.400	2.00	11.2	107%	50 - 150	0.4	25	11/21/12 12:15	12K0181
Methylene chloride	13.0		ppbv	0.400	2.00	10.8	121%	50 - 150	1	25	11/21/12 12:15	12K0181
2-Methyl-2-butene	12.0		ppbv	0.400	2.00	11.6	103%	50 - 150	2	25	11/21/12 12:15	12K0181
Carbon disulfide	9.02		ppbv	0.400	2.00	11.0	82%	50 - 150	7	25	11/21/12 12:15	12K0181
Allyl chloride	12.2		ppbv	0.400	2.00	10.8	113%	50 - 150	0.3	25	11/21/12 12:15	12K0181
1,1,2-Trichlorotrifluoroethane	11.3		ppbv	0.400	2.00	11.1	102%	50 - 150	6	25	11/21/12 12:15	12K0181
trans-1,2-Dichloroethene	11.0		ppbv	0.400	2.00	10.9	101%	50 - 150	0.8	25	11/21/12 12:15	12K0181
4-Methyl-1-pentene	12.4		ppbv	0.400	2.00	10.9	114%	50 - 150	4	25	11/21/12 12:15	12K0181
1,1-Dichloroethane	11.4		ppbv	0.400	2.00	10.9	105%	50 - 150	0.6	25	11/21/12 12:15	12K0181
Methyl tert-Butyl Ether	9.83		ppbv	0.400	2.00	11.0	90%	50 - 150	6	25	11/21/12 12:15	12K0181
Vinyl acetate	13.5		ppbv	0.400	2.00	11.3	119%	50 - 150	4	50	11/21/12 12:15	12K0181
2-Butanone (MEK)	8.75		ppbv	0.400	2.00	11.3	77%	50 - 150	15	25	11/21/12 12:15	12K0181
Chloroprene	11.4		ppbv	0.400	2.00	10.9	105%	50 - 150	0.4	25	11/21/12 12:15	12K0181
cis-1,2-Dichloroethene	11.4		ppbv	0.400	2.00	11.1	103%	50 - 150	0.5	25	11/21/12 12:15	12K0181
Hexane	11.0		ppbv	0.400	2.00	11.5	96%	50 - 150	1	25	11/21/12 12:15	12K0181
Chloroform	11.1		ppbv	0.400	2.00	10.7	104%	50 - 150	2	25	11/21/12 12:15	12K0181
trans-2-Hexene	11.9		ppbv	0.400	2.00	11.3	105%	50 - 150	0.7	25	11/21/12 12:15	12K0181
cis-2-Hexene	10.9		ppbv	0.400	2.00	10.8	102%	50 - 150	1	25	11/21/12 12:15	12K0181

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	Limit	Date Analyzed	QC Batch
Sample ID: 12K0181-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
1,2-Dichloroethane	11.8		ppbv	0.400	2.00	10.9	109%	50 - 150	2	25	11/21/12 12:15	12K0181
1,1,1-Trichloroethane	12.4		ppbv	0.400	2.00	10.9	114%	50 - 150	4	25	11/21/12 12:15	12K0181
Benzene	11.6		ppbv	0.400	2.00	10.9	107%	50 - 150	2	25	11/21/12 12:15	12K0181
Carbon tetrachloride	17.9		ppbv	0.400	2.00	11.9	150%	50 - 150	1	25	11/21/12 12:15	12K0181
Cyclohexane	13.0		ppbv	0.400	2.00	11.1	117%	50 - 150	0.6	25	11/21/12 12:15	12K0181
1,2-Dichloropropane	12.5		ppbv	0.400	2.00	11.0	113%	50 - 150	2	25	11/21/12 12:15	12K0181
Bromodichloromethane	14.2		ppbv	0.400	2.00	11.1	128%	50 - 150	1	25	11/21/12 12:15	12K0181
Trichloroethene	12.6		ppbv	0.400	2.00	11.1	114%	50 - 150	3	25	11/21/12 12:15	12K0181
2,2,4-Trimethylpentane	13.7		ppbv	0.400	2.00	11.0	125%	50 - 150	2	25	11/21/12 12:15	12K0181
Heptane	11.1		ppbv	0.400	2.00	11.2	99%	50 - 150	3	25	11/21/12 12:15	12K0181
cis-1,3-Dichloropropene	12.7		ppbv	0.400	2.00	11.2	113%	50 - 150	2	25	11/21/12 12:15	12K0181
4-Methyl-2-pentanone (MIBK)	12.3		ppbv	0.400	2.00	11.4	108%	50 - 150	2	25	11/21/12 12:15	12K0181
trans-1,3-Dichloropropene	12.3		ppbv	0.400	2.00	10.4	118%	50 - 150	0.6	25	11/21/12 12:15	12K0181
1,1,2-Trichloroethane	12.0		ppbv	0.400	2.00	11.1	108%	50 - 150	0.3	25	11/21/12 12:15	12K0181
Toluene	11.9		ppbv	0.400	2.00	11.1	107%	50 - 150	1	25	11/21/12 12:15	12K0181
2-Hexanone	12.5	B	ppbv	0.400	2.00	11.6	108%	50 - 150	4	25	11/21/12 12:15	12K0181
Chlorodibromomethane	16.6		ppbv	0.400	2.00	11.7	142%	50 - 150	0.8	25	11/21/12 12:15	12K0181
1,2-Dibromoethane (EDB)	12.6		ppbv	0.400	2.00	11.1	114%	50 - 150	2	25	11/21/12 12:15	12K0181
n-Octane	13.6		ppbv	0.400	2.00	11.0	124%	50 - 150	7	25	11/21/12 12:15	12K0181
Tetrachloroethene	12.7		ppbv	0.400	2.00	10.4	123%	50 - 150	2	25	11/21/12 12:15	12K0181
Chlorobenzene	12.2		ppbv	0.400	2.00	11.2	109%	50 - 150	0.05	25	11/21/12 12:15	12K0181
Ethylbenzene	12.4		ppbv	0.400	2.00	11.1	112%	50 - 150	7	25	11/21/12 12:15	12K0181
m-Xylene & p-Xylene	25.8		ppbv	0.800	2.00	21.8	119%	50 - 150	6	25	11/21/12 12:15	12K0181
Bromoform	**26.1**	**L1**	**ppbv**	**0.400**	**2.00**	**10.9**	**240%**	**50 - 150**	**1**	**25**	**11/21/12 12:15**	**12K0181**
Styrene	12.4		ppbv	0.400	2.00	11.2	110%	50 - 150	3	25	11/21/12 12:15	12K0181
1,1,2,2-Tetrachloroethane	14.1		ppbv	0.400	2.00	11.2	126%	50 - 150	12	25	11/21/12 12:15	12K0181
o-Xylene	13.8		ppbv	0.400	2.00	11.2	123%	50 - 150	10	25	11/21/12 12:15	12K0181
Xylenes, total	39.6		ppbv	1.20	2.00	33.0	120%	50 - 150	8	25	11/21/12 12:15	12K0181
n-Nonane	14.8		ppbv	0.400	2.00	10.9	136%	50 - 150	8	25	11/21/12 12:15	12K0181
Isopropylbenzene	13.9		ppbv	0.400	2.00	10.8	129%	50 - 150	12	50	11/21/12 12:15	12K0181
2 & 3-Chlorotoluene	13.2		ppbv	0.800	2.00	10.9	121%	50 - 150	12	25	11/21/12 12:15	12K0181
n-Propylbenzene	13.6		ppbv	0.400	2.00	10.7	127%	50 - 150	9	25	11/21/12 12:15	12K0181
4-Ethyltoluene	**17.5**	**L1**	**ppbv**	**0.400**	**2.00**	**11.4**	**153%**	**50 - 150**	**9**	**25**	**11/21/12 12:15**	**12K0181**
1,3,5-Trimethylbenzene	15.4		ppbv	0.400	2.00	11.0	140%	50 - 150	10	25	11/21/12 12:15	12K0181
1,2,4-Trimethylbenzene	**19.0**	**L1**	**ppbv**	**0.400**	**2.00**	**10.8**	**176%**	**50 - 150**	**12**	**25**	**11/21/12 12:15**	**12K0181**
tert-Butylbenzene	**16.8**	**L1**	**ppbv**	**0.400**	**2.00**	**10.8**	**156%**	**50 - 150**	**8**	**25**	**11/21/12 12:15**	**12K0181**

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	Limit	Date Analyzed	QC Batch
Sample ID: 12K0181-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Benzyl chloride	**30.8**	**L1**	**ppbv**	**0.400**	**2.00**	**11.2**	**275%**	**50 - 150**	**6**	**25**	**11/21/12 12:15**	**12K0181**
1,3-Dichlorobenzene	14.1		ppbv	0.400	2.00	11.2	126%	50 - 150	4	25	11/21/12 12:15	12K0181
n-Decane	**18.3**	**L1**	**ppbv**	**0.400**	**2.00**	**11.0**	**167%**	**50 - 150**	**8**	**25**	**11/21/12 12:15**	**12K0181**
1,4-Dichlorobenzene	14.9		ppbv	0.400	2.00	11.0	135%	50 - 150	2	25	11/21/12 12:15	12K0181
4-Isopropyltoluene	**17.2**	**L1**	**ppbv**	**0.400**	**2.00**	**10.7**	**161%**	**50 - 150**	**12**	**25**	**11/21/12 12:15**	**12K0181**
1,2-Dichlorobenzene	16.5		ppbv	0.400	2.00	11.1	149%	50 - 150	15	25	11/21/12 12:15	12K0181
n-Butylbenzene	**16.7**	**L1**	**ppbv**	**0.400**	**2.00**	**10.7**	**157%**	**50 - 150**	**17**	**25**	**11/21/12 12:15**	**12K0181**
n-Undecane	14.9		ppbv	0.400	2.00	10.9	137%	50 - 150	5	25	11/21/12 12:15	12K0181
1,2,4-Trichlorobenzene	**21.1**	**L1, B**	**ppbv**	**0.400**	**2.00**	**11.1**	**190%**	**50 - 150**	**18**	**25**	**11/21/12 12:15**	**12K0181**
Naphthalene	**16.2**	**L1, B**	**ppbv**	**0.400**	**2.00**	**10.5**	**155%**	**50 - 150**	**19**	**25**	**11/21/12 12:15**	**12K0181**
Hexachlorobutadiene	**17.8**	**L1**	**ppbv**	**0.400**	**2.00**	**11.0**	**162%**	**50 - 150**	**4**	**25**	**11/21/12 12:15**	**12K0181**
1,2-Dichloroethene, Total	22.5		ppbv	0.800	2.00	22.0	102%	50 - 150	0.2	25	11/21/12 12:15	12K0181
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*102%*										11/21/12 12:15	12K0181
Surr: Fluorobenzene (46-118%)	*92%*										11/21/12 12:15	12K0181
Surr: Toluene-d8 (70-136%)	*100%*										11/21/12 12:15	12K0181
Surr: 1,4-Dichlorobutane (38-135%)	*105%*										11/21/12 12:15	12K0181
Surr: 4-Bromofluorobenzene (51-128%)	*98%*										11/21/12 12:15	12K0181
Sample ID: 12K0235-BSD1 (LCS Dup - Air)												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Ethene	11.2		ppbv	0.800	4.00	11.1	101%	50 - 150	4	25	11/30/12 13:19	12K0235
Acetylene	12.7		ppbv	0.800	4.00	11.1	115%	50 - 150	5	25	11/30/12 13:19	12K0235
Ethane	10.8		ppbv	0.800	4.00	11.1	98%	50 - 150	6	25	11/30/12 13:19	12K0235
Propylene	11.9		ppbv	0.800	4.00	10.7	112%	50 - 150	7	25	11/30/12 13:19	12K0235
Chlorodifluoromethane	13.0		ppbv	0.800	4.00	10.7	122%	50 - 150	8	25	11/30/12 13:19	12K0235
Propane	12.0		ppbv	0.800	4.00	10.6	114%	50 - 150	7	25	11/30/12 13:19	12K0235
Dichlorodifluoromethane	11.6		ppbv	0.800	4.00	10.6	110%	50 - 150	8	25	11/30/12 13:19	12K0235
Chloromethane	12.7		ppbv	0.800	4.00	10.8	118%	50 - 150	8	25	11/30/12 13:19	12K0235
Isobutane	11.8		ppbv	0.800	4.00	10.6	112%	50 - 150	8	25	11/30/12 13:19	12K0235
1,2-Dichloro-1,1,2,2-tetrafluoroethane	9.76		ppbv	0.800	4.00	10.7	92%	50 - 150	8	25	11/30/12 13:19	12K0235
Vinyl chloride	10.8		ppbv	0.800	4.00	10.7	101%	50 - 150	8	25	11/30/12 13:19	12K0235
1-Butene/Isobutene	12.0		ppbv	0.800	4.00	10.5	115%	50 - 150	6	25	11/30/12 13:19	12K0235
1,3-Butadiene	12.9		ppbv	0.800	4.00	10.9	118%	50 - 150	5	25	11/30/12 13:19	12K0235
Butane	11.9		ppbv	0.800	4.00	10.6	113%	50 - 150	8	25	11/30/12 13:19	12K0235

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Work Order: AVK0120
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Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	Limit	Date Analyzed	QC Batch
Sample ID: 12K0235-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
trans-2-Butene	12.2		ppbv	0.800	4.00	10.3	118%	50 - 150	4	25	11/30/12 13:19	12K0235
Bromomethane	11.9		ppbv	0.800	4.00	10.6	113%	50 - 150	6	25	11/30/12 13:19	12K0235
cis-2-Butene	13.3		ppbv	0.800	4.00	11.2	118%	50 - 150	4	25	11/30/12 13:19	12K0235
Chloroethane	11.1		ppbv	0.800	4.00	10.5	106%	50 - 150	4	25	11/30/12 13:19	12K0235
Vinyl bromide	11.6		ppbv	0.800	4.00	10.8	108%	50 - 150	3	25	11/30/12 13:19	12K0235
3-Methyl-1-butene	13.0		ppbv	0.800	4.00	10.9	119%	50 - 150	5	25	11/30/12 13:19	12K0235
Acetonitrile	10.0		ppbv	0.800	4.00	10.5	96%	50 - 150	9	25	11/30/12 13:19	12K0235
Isopentane	12.1		ppbv	0.800	4.00	11.1	109%	50 - 150	6	25	11/30/12 13:19	12K0235
Trichlorofluoromethane	13.0		ppbv	0.800	4.00	11.1	117%	50 - 150	5	25	11/30/12 13:19	12K0235
1-Pentene	12.3		ppbv	0.800	4.00	11.5	106%	50 - 150	4	25	11/30/12 13:19	12K0235
Acetone	10.5	B	ppbv	0.800	4.00	11.1	95%	50 - 150	3	25	11/30/12 13:19	12K0235
Acrylonitrile	11.0		ppbv	0.800	4.00	11.1	100%	50 - 150	6	25	11/30/12 13:19	12K0235
n-Pentane	13.3		ppbv	0.800	4.00	11.1	120%	50 - 150	0.6	25	11/30/12 13:19	12K0235
Diethyl ether	9.96		ppbv	0.800	4.00	11.0	91%	50 - 150	9	25	11/30/12 13:19	12K0235
Isoprene	9.87		ppbv	0.800	4.00	11.0	90%	50 - 150	3	25	11/30/12 13:19	12K0235
trans-2-Pentene	11.3		ppbv	0.800	4.00	11.2	101%	50 - 150	4	25	11/30/12 13:19	12K0235
1,1-Dichloroethene	12.0		ppbv	0.800	4.00	11.2	107%	50 - 150	0.2	25	11/30/12 13:19	12K0235
cis-2-Pentene	11.3		ppbv	0.800	4.00	11.3	100%	50 - 150	5	25	11/30/12 13:19	12K0235
Methylene chloride	12.4		ppbv	0.800	4.00	10.9	114%	50 - 150	4	25	11/30/12 13:19	12K0235
2-Methyl-2-butene	11.6		ppbv	0.800	4.00	11.7	99%	50 - 150	5	25	11/30/12 13:19	12K0235
Carbon disulfide	10.1		ppbv	0.800	4.00	11.1	91%	50 - 150	5	25	11/30/12 13:19	12K0235
Allyl chloride	13.1		ppbv	0.800	4.00	10.9	121%	50 - 150	4	25	11/30/12 13:19	12K0235
1,1,2-Trichlorotrifluoroethane	13.2		ppbv	0.800	4.00	11.2	118%	50 - 150	6	25	11/30/12 13:19	12K0235
trans-1,2-Dichloroethene	10.3		ppbv	0.800	4.00	11.0	94%	50 - 150	3	25	11/30/12 13:19	12K0235
4-Methyl-1-pentene	11.9		ppbv	0.800	4.00	11.0	109%	50 - 150	3	25	11/30/12 13:19	12K0235
1,1-Dichloroethane	10.7		ppbv	0.800	4.00	11.0	97%	50 - 150	5	25	11/30/12 13:19	12K0235
Methyl tert-Butyl Ether	10.1		ppbv	0.800	4.00	11.1	91%	50 - 150	2	25	11/30/12 13:19	12K0235
Vinyl acetate	12.6		ppbv	0.800	4.00	11.4	110%	50 - 150	10	50	11/30/12 13:19	12K0235
2-Butanone (MEK)	10.3		ppbv	0.800	4.00	11.4	90%	50 - 150	5	25	11/30/12 13:19	12K0235
Chloroprene	10.5		ppbv	0.800	4.00	11.0	96%	50 - 150	3	25	11/30/12 13:19	12K0235
cis-1,2-Dichloroethene	10.5		ppbv	0.800	4.00	11.2	94%	50 - 150	5	25	11/30/12 13:19	12K0235
Hexane	10.4		ppbv	0.800	4.00	11.6	89%	50 - 150	2	25	11/30/12 13:19	12K0235
Chloroform	10.4		ppbv	0.800	4.00	10.8	97%	50 - 150	5	25	11/30/12 13:19	12K0235
trans-2-Hexene	10.7		ppbv	0.800	4.00	11.4	94%	50 - 150	5	25	11/30/12 13:19	12K0235
cis-2-Hexene	9.89		ppbv	0.800	4.00	10.9	91%	50 - 150	4	25	11/30/12 13:19	12K0235
1,2-Dichloroethane	11.1		ppbv	0.800	4.00	11.0	101%	50 - 150	6	25	11/30/12 13:19	12K0235

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	Limit	Date Analyzed	QC Batch
Sample ID: 12K0235-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
1,1,1-Trichloroethane	12.2		ppbv	0.800	4.00	11.0	111%	50 - 150	2	25	11/30/12 13:19	12K0235
Benzene	10.4		ppbv	0.800	4.00	11.0	95%	50 - 150	13	25	11/30/12 13:19	12K0235
Carbon tetrachloride	**18.7**	**L1**	**ppbv**	**0.800**	**4.00**	**12.1**	**155%**	**50 - 150**	**11**	**25**	**11/30/12 13:19**	**12K0235**
Cyclohexane	12.7		ppbv	0.800	4.00	11.2	114%	50 - 150	11	25	11/30/12 13:19	12K0235
1,2-Dichloropropane	11.1		ppbv	0.800	4.00	11.1	100%	50 - 150	14	25	11/30/12 13:19	12K0235
Bromodichloromethane	12.9		ppbv	0.800	4.00	11.2	116%	50 - 150	13	25	11/30/12 13:19	12K0235
Trichloroethene	11.7		ppbv	0.800	4.00	11.2	105%	50 - 150	15	25	11/30/12 13:19	12K0235
2,2,4-Trimethylpentane	12.6		ppbv	0.800	4.00	11.1	114%	50 - 150	15	25	11/30/12 13:19	12K0235
Heptane	9.75		ppbv	0.800	4.00	11.3	86%	50 - 150	12	25	11/30/12 13:19	12K0235
cis-1,3-Dichloropropene	11.1		ppbv	0.800	4.00	11.3	98%	50 - 150	15	25	11/30/12 13:19	12K0235
4-Methyl-2-pentanone (MIBK)	11.5		ppbv	0.800	4.00	11.5	100%	50 - 150	14	25	11/30/12 13:19	12K0235
trans-1,3-Dichloropropene	10.6		ppbv	0.800	4.00	10.5	101%	50 - 150	15	25	11/30/12 13:19	12K0235
1,1,2-Trichloroethane	11.1		ppbv	0.800	4.00	11.2	99%	50 - 150	13	25	11/30/12 13:19	12K0235
Toluene	10.7		ppbv	0.800	4.00	11.2	96%	50 - 150	13	25	11/30/12 13:19	12K0235
2-Hexanone	11.8	B	ppbv	0.800	4.00	11.7	100%	50 - 150	19	25	11/30/12 13:19	12K0235
Chlorodibromomethane	15.5		ppbv	0.800	4.00	11.8	131%	50 - 150	13	25	11/30/12 13:19	12K0235
1,2-Dibromoethane (EDB)	11.4		ppbv	0.800	4.00	11.2	102%	50 - 150	13	25	11/30/12 13:19	12K0235
n-Octane	11.3		ppbv	0.800	4.00	11.1	102%	50 - 150	11	25	11/30/12 13:19	12K0235
Tetrachloroethene	11.9		ppbv	0.800	4.00	10.5	113%	50 - 150	13	25	11/30/12 13:19	12K0235
Chlorobenzene	11.1		ppbv	0.800	4.00	11.3	98%	50 - 150	11	25	11/30/12 13:19	12K0235
Ethylbenzene	10.3		ppbv	0.800	4.00	11.2	92%	50 - 150	12	25	11/30/12 13:19	12K0235
m-Xylene & p-Xylene	21.3		ppbv	1.60	4.00	22.0	97%	50 - 150	11	25	11/30/12 13:19	12K0235
Bromoform	**23.4**	**L1**	**ppbv**	**0.800**	**4.00**	**11.0**	**214%**	**50 - 150**	**9**	**25**	**11/30/12 13:19**	**12K0235**
Styrene	9.55		ppbv	0.800	4.00	11.3	84%	50 - 150	10	25	11/30/12 13:19	12K0235
1,1,2,2-Tetrachloroethane	11.3		ppbv	0.800	4.00	11.3	100%	50 - 150	13	25	11/30/12 13:19	12K0235
o-Xylene	11.3		ppbv	0.800	4.00	11.3	100%	50 - 150	12	25	11/30/12 13:19	12K0235
Xylenes, total	32.5		ppbv	2.40	4.00	33.3	98%	50 - 150	11	25	11/30/12 13:19	12K0235
n-Nonane	11.5		ppbv	0.800	4.00	11.0	104%	50 - 150	13	25	11/30/12 13:19	12K0235
Isopropylbenzene	11.3		ppbv	0.800	4.00	10.9	104%	50 - 150	14	50	11/30/12 13:19	12K0235
2 & 3-Chlorotoluene	9.90		ppbv	1.60	4.00	11.0	90%	50 - 150	10	25	11/30/12 13:19	12K0235
n-Propylbenzene	9.96		ppbv	0.800	4.00	10.8	93%	50 - 150	12	25	11/30/12 13:19	12K0235
4-Ethyltoluene	12.4		ppbv	0.800	4.00	11.5	108%	50 - 150	12	25	11/30/12 13:19	12K0235
1,3,5-Trimethylbenzene	12.1		ppbv	0.800	4.00	11.1	109%	50 - 150	16	25	11/30/12 13:19	12K0235
1,2,4-Trimethylbenzene	13.8		ppbv	0.800	4.00	10.9	127%	50 - 150	16	25	11/30/12 13:19	12K0235
tert-Butylbenzene	14.1		ppbv	0.800	4.00	10.9	130%	50 - 150	18	25	11/30/12 13:19	12K0235
Benzyl chloride	**22.0**	**L1**	**ppbv**	**0.800**	**4.00**	**11.3**	**195%**	**50 - 150**	**16**	**25**	**11/30/12 13:19**	**12K0235**

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AVK0120
Project: AENV Canada Creosote
Project Number: 08-1436-0106

Received: 11/15/12 08:30
Reported: 12/13/12 14:27

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	Limit	Date Analyzed	QC Batch
Sample ID: 12K0235-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
1,3-Dichlorobenzene	10.9	B	ppbv	0.800	4.00	11.3	96%	50 - 150	15	25	11/30/12 13:19	12K0235
n-Decane	13.4		ppbv	0.800	4.00	11.1	121%	50 - 150	19	25	11/30/12 13:19	12K0235
1,4-Dichlorobenzene	11.5	B	ppbv	0.800	4.00	11.1	104%	50 - 150	17	25	11/30/12 13:19	12K0235
4-Isopropyltoluene	12.6		ppbv	0.800	4.00	10.8	117%	50 - 150	19	25	11/30/12 13:19	12K0235
1,2-Dichlorobenzene	12.3	B	ppbv	0.800	4.00	11.2	110%	50 - 150	19	25	11/30/12 13:19	12K0235
n-Butylbenzene	11.4	B	ppbv	0.800	4.00	10.8	106%	50 - 150	25	25	11/30/12 13:19	12K0235
n-Undecane	11.1	R2	ppbv	0.800	4.00	11.0	101%	50 - 150	26	25	11/30/12 13:19	12K0235
1,2,4-Trichlorobenzene	16.3	R2, B	ppbv	0.800	4.00	11.2	146%	50 - 150	34	25	11/30/12 13:19	12K0235
Naphthalene	13.0	R2, B	ppbv	0.800	4.00	10.6	123%	50 - 150	38	25	11/30/12 13:19	12K0235
Hexachlorobutadiene	14.8	R2	ppbv	0.800	4.00	11.1	134%	50 - 150	27	25	11/30/12 13:19	12K0235
1,2-Dichloroethene, Total	20.8		ppbv	1.60	4.00	22.2	94%	50 - 150	4	25	11/30/12 13:19	12K0235
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*97%*										11/30/12 13:19	12K0235
Surr: Fluorobenzene (46-118%)	*89%*										11/30/12 13:19	12K0235
Surr: Toluene-d8 (70-136%)	*98%*										11/30/12 13:19	12K0235
Surr: 1,4-Dichlorobutane (38-135%)	*100%*										11/30/12 13:19	12K0235
Surr: 4-Bromofluorobenzene (51-128%)	*90%*										11/30/12 13:19	12K0235

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
14050 Summit Drive, Suite A100 Austin, TX 78728 * 512-244-0855 * Fax 512-244-0160

Golder Associates Ltd.	Work Order:	AVK0120	Received: 11/15/12 08:30
500-4260 Still Creek Drive			Reported: 12/13/12 14:27
Burnaby, British Columbia, CANADA V5C6C6	Project:	AENV Canada Creosote	
Julie Burghardt	Project Number:	08-1436-0106	

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
C4	Calibration Verification recovery was below the method control limit for this analyte.
C8	Calibration Verification recovery was above the method control limit for this analyte. A high bias may be indicated.
I2	Internal Standard recovery was outside of method limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
L1	Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was above acceptance limits.
R2	The RPD exceeded the acceptance limit.
R4	Due to the low levels of analyte in the sample, the duplicate RPD calculation does not provide useful information.
RA	Results are from a second analysis of the sample.
U	Result less than sample specific method detection limit
ZX	Due to sample matrix effects, the surrogate recovery was outside the acceptance limits.
ND	Not detected.

TestAmerica – Austin Laboratory Chain of Custody Addendum **Work Order Number** AVK0120

RECEIVED BY: RL. CLIENT: Golder Assoc LTD

DATE/TIME RECEIVED: 11/15/12 0830 PROJECT: AENV CANADA CREOSOTE

UNPACKED DATE/TIME: 11/15/12 1040 LOGIN BY: dsw LOGIN REVIEWED BY: VNS

Number of Shipping Containers Received with COC: 1

VOC SAMPLES: ☑ YES **(IF YES, GO TO SECTIONS 1.0, 2.0, 6.0, & 7.0)** A8-3

1.0 CONTAINERS EXAMINED UPON RECEIPT: RL.

Container Sealed: ☑ YES ☐ NO Custody Seal Present: ☐ YES ☑ NO Custody Seal Signed/Dated: ☐ YES ☑ NO

If seal not intact list air bill number of that container(s): _____

2.0 VOC CANISTERS EXAMINED UPON RECEIPT: RL.

Canister Valves Closed: ☑ YES ☐ NO Canister Valves Capped: ☑ YES ☐ NO

Sample IDs match COC: ☑ YES ☐ NO Other Equipment Received: ☑ YES ☐ NO

Valve Cap Tightened Properly: ☑ YES ☐ NO Can Size: ☑ 6L ☐ 1L Other: _____

Packing Material Used: (circle) None / Absorbent / Paper / Bubble Wrap 3-VFRs

Samples received in Tedlar bags ☐ N/A ☐ YES ☑ NO

3.0 CONDITION OF BOTTLES/CONTAINERS **VERIFIED BY:** _____

Sample IDs match COC: ☐ YES ☐ NO Bottles received intact: ☐ YES ☐ NO

See additional discrepancies/comments section: ☐ YES ☐ NO Samples received from USDA restricted area: ☐ YES ☐ NO

Chain-of-Custody form properly maintained: ☐ YES ☐ NO VOA trip blanks included: ☐ N/A ☐ YES ☐ NO

4.0 SAMPLE TEMPERATURE UPON RECEIPT BY: _____ **IR THERMOMETER #:** ☐ P5 ☐ P7

Container(s) temperature: TB = Temp. Blank and/or SC = Sample Container CF = Correction Factor *[acceptable tolerance ≤6°C]*

TB ☐ SC ☐	TB ☐ SC ☐	TB ☐ SC ☐	TB ☐ SC ☐	TB ☐ SC ☐	TB ☐ SC ☐	TB ☐ SC ☐	TB ☐ SC ☐
Initial	Initial	Initial	Initial	Initial	Initial	Initial	Initial
CF	CF	CF	CF	CF	CF	CF	CF
Final	Final	Final	Final	Final	Final	Final	Final

If temperature is outside acceptable tolerance, Project Manager was notified (_____PM). Date: _____ Time: _____

Samples received do not require cooling _____ OK to analyze samples: ☐ YES ☐ NO

5.0 PRESERVATION CHECKS

PRESERVATION OF SAMPLES REQUIRED: ☐ N/A ☐ YES ☐ VOA Samples **VERIFIED BY:** _____

NOTE: pH CHECK OF SAMPLES PERFORMED AT TIME OF ANALYSIS BY BENCH ANALYST

pH CHECK OF VOLATILE SAMPLES PERFORMED AFTER ANALYSIS BY THE BENCH ANALYST.

Cyanide samples checked for sulfides: ☐ YES ☐ NO

Sulfide samples appear to be preserved with zinc acetate: ☐ YES ☐ NO

Chlorine checked per specification (EPA 335.x & N.C.) ☐ YES ☐ NO Free chlorine present: ☐ YES ☐ NO

If preservation is outside acceptable limit, PM notified (_____PM) Date/Time: _____

Volatile samples filled completely: ☐ YES ☐ NO [if no, list ID and approx. amt. of headspace (>6mm) in Comments Section 7.0]

6.0 SHIPPING DOCUMENTATION:

Air/freight bill is available and attached to COC: ☑ YES ☐ NO Air bill #: _____

Hand-delivered Carrier: _____ Date: _____ Time: _____

7.0 OTHER COMMENTS:

_____

_____

_____

8.0 CORRECTIVE ACTION:

Client's Name: _____ Informed verbally on: _____ By: _____

Client's Name: _____ Informed verbally on: _____ By: _____

Sample(s) processed "as is" comments: _____

Samples(s) on hold until: _____ If released, notify: _____

Project Management Login Review: Mark Sabeka Date: 11/16/12

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE Revised 07/26/11

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Canister Samples Chain of Custody Record

AVK0120

TestAmerica Austin
14050 Summit Dr.
Suite A-100
Austin, TX 78728
phone: 512-244-0855 fax: 512-244-0160

Client Contact Information	Project Manager: Jill Burghardt		1 of 1 COCs
Company: Golder Associates	Phone: 1(403) 299 5600	Samples Collected By: BMS	
Address: 102-2535 3rd AVE SE	Email: JBurghardt@golder.com		
City/State/Zip CALGARY, Alberta, Canada	Site Contact: Brittney Sammons		
Phone: 299 5600	LAB Contact:		
FAX: 1(403) 299-5606	Analysis Turnaround Time		
Project Name: CANADA CREOSOTE	Standard (Specify) X		
~~Site:~~ SOIL VAPOUR SAMPLING	Rush (Specity)		
PO # 11-1324-0164			

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, Hg (Stop)	Flow Controller ID	Canister ID	TO-15 PIANO	TO-14A	TO-3	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
MW10-6-W	NOV 12,'12	09:14	10:11	25.4	2.0	7299282	5420	X										X		
MW11-09-S	↓	09:47	10:43	25	4	7301110	RA2306	X										X		
MW11-08-D	↓	11:03	12:13	24	4	A017 M/L 5500DG	RA0971	X										X		

Special Instructions/QC Requirements & Comments:

Samples Shipped by: Brittney Sammons	Date/Time: NOV 12, 2012	Samples Received by:
Samples Relinquished by: Brittney Sammons	Date/Time: NOV 12, 2012	Received by:
Relinquished by:	Date/Time: 11	Received by: 11/15/12 0830

TAL-4143 (0608)

Lab Use Only **Shipper Name:** **Opened by:** **Condition:**

Maxxam

Success Through Science®

Your Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Your C.O.C. #: A213718, A213719

Attention: Julie Burghardt
GOLDER ASSOCIATES LTD.
CALGARY - NATIONAL CONTRACT
102, 2535 - 3rd Avenue SE
CALGARY, AB
CANADA T2A 7W5

Report Date: 2012/11/21

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B2A3967
Received: 2012/11/13, 18:05

Sample Matrix: Water
Samples Received: 15

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS	4	N/A	2012/11/16	AB SOP-00039	CCME, EPA 8260C
BTEX/F1 in Water by HS GC/MS	8	N/A	2012/11/17	AB SOP-00039	CCME, EPA 8260C
BTEX/F1 in Water by HS GC/MS	3	N/A	2012/11/21	AB SOP-00039	CCME, EPA 8260C
CCME Hydrocarbons in Water (F2; C10-C16)	8	2012/11/16	2012/11/17	AB SOP-00040 AB SOP-00037	EPA3510C/CCME PHCCWS
CCME Hydrocarbons in Water (F2; C10-C16)	4	2012/11/16	2012/11/18	AB SOP-00040 AB SOP-00037	EPA3510C/CCME PHCCWS
CCME Hydrocarbons in Water (F2; C10-C16)	2	2012/11/16	2012/11/21	AB SOP-00040 AB SOP-00037	EPA3510C/CCME PHCCWS
Benzo[a]pyrene Equivalency	14	N/A	2012/11/21	AB SOP-00003	EPA 8270D
Polycyclic Aromatic Hydrocarbons (1)	10	2012/11/16	2012/11/18	AB SOP-00003 AB SOP-00037	EPA 3510C/8270D
Polycyclic Aromatic Hydrocarbons (1)	4	2012/11/16	2012/11/20	AB SOP-00003 AB SOP-00037	EPA 3510C/8270D
Total Trihalomethanes Calculation	15	N/A	2012/11/19	CAL SOP-00104	EPA 8260 C
VOCs in Water by HS GC/MS (Std List)	14	N/A	2012/11/16	CAL SOP-00227	EPA 8260 C
VOCs in Water by HS GC/MS (Std List)	1	N/A	2012/11/19	CAL SOP-00227	EPA 8260 C

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

Encryption Key

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

Anna Gordon, Project Manager
Email: AGordon@maxxam.ca
Phone# (403) 291-3077

==========

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

Total cover pages: 1

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

AT1 BTEX AND F1-F2 (WATER)

Maxxam ID		FA1130	FA1130	FA1144	FA1150	FA1158	FA1162	FA1163		
Sampling Date		2012/11/12 16:00	2012/11/12 16:00	2012/11/12 16:25	2012/11/12 17:35	2012/11/12 18:10	2012/11/12 18:50	2012/11/13 09:55		
	UNITS	**MW4B**	**MW4B Lab-Dup**	**MW4A**	**MW1A**	**MW2A**	**MW2B**	**MW3A**	**RDL**	**QC Batch**
Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10		<0.10	1.8	<0.10	29	<0.10	0.10	6351268
Surrogate Recovery (%)										
O-TERPHENYL (sur.)	%	98		106	99	98	91	101		6351268
Volatiles										
Benzene	mg/L	<0.00040	<0.00040	<0.00040	0.010	<0.00040	0.012	<0.00040	0.00040	6349515
Toluene	mg/L	<0.00040	<0.00040	<0.00040	0.033	<0.00040	0.088	<0.00040	0.00040	6349515
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	0.016	<0.00040	0.051	<0.00040	0.00040	6349515
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	0.027	<0.00040	0.15	<0.00040	0.00040	6349515
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	0.053	<0.00080	0.34	<0.00080	0.00080	6349515
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	0.080	<0.00080	0.49	<0.00080	0.00080	6349515
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.42	<0.10	0.10	6349515
(C6-C10)	mg/L	<0.10	<0.10	<0.10	0.19	<0.10	1.1	<0.10	0.10	6349515
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	104	105	105	107	106	103	106		6349515
4-BROMOFLUOROBENZENE (sur.)	%	103	103	103	104	103	100	101		6349515
D4-1,2-DICHLOROETHANE (sur.)	%	107	108	108	99	92	85	106		6349515

RDL = Reportable Detection Limit

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

AT1 BTEX AND F1-F2 (WATER)

Maxxam ID		FA1165		FA1166	FA1167	FA1168		FA1169		
Sampling Date		2012/11/13 11:35		2012/11/13 12:30	2012/11/13 13:40	2012/11/13 14:30		2012/11/13 16:00		
	UNITS	**MW11-01A**	**RDL**	**MW10-16**	**MW10-7A**	**MW10-18**	**RDL**	**MW11-06**	**RDL**	**QC Batch**
Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/L	24	0.10	<0.10	8.6	<0.10	0.10	29(1)	0.20	6351268
Surrogate Recovery (%)										
O-TERPHENYL (sur.)	%	81		101	101	102		96		6351268
Volatiles										
Benzene	mg/L	0.14	0.040	<0.00040	0.087	<0.00040	0.00040	0.86	0.040	6349515
Toluene	mg/L	0.11	0.040	<0.00040	0.012	<0.00040	0.00040	2.2	0.040	6349515
Ethylbenzene	mg/L	0.28	0.040	<0.00040	0.18	<0.00040	0.00040	0.59	0.040	6349515
o-Xylene	mg/L	0.28	0.040	<0.00040	0.15	<0.00040	0.00040	0.83	0.040	6349515
m & p-Xylene	mg/L	0.40	0.080	<0.00080	0.13	<0.00080	0.00080	1.6	0.080	6349515
Xylenes (Total)	mg/L	0.68	0.080	<0.00080	0.29	<0.00080	0.00080	2.5	0.080	6349515
F1 (C6-C10) - BTEX	mg/L	<10	10	<0.10	0.11	<0.10	0.10	<10	10	6349515
(C6-C10)	mg/L	11	10	<0.10	0.68	<0.10	0.10	10	10	6349515
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	107		112	106	106		106		6349515
4-BROMOFLUOROBENZENE (sur.)	%	101		101	106	105		104		6349515
D4-1,2-DICHLOROETHANE (sur.)	%	104		106	99	111		105		6349515

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

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

AT1 BTEX AND F1-F2 (WATER)

Maxxam ID		FA1170		FA1171		FA1172	FA1172		
Sampling Date		2012/11/13 16:40		2012/11/13		2012/11/13 15:10	2012/11/13 15:10		
	UNITS	**MW11-04A**	**RDL**	**DUP 1**	**RDL**	**MW11-03A**	**MW11-03A Lab-Dup**	**RDL**	**QC Batch**
Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	mg/L	0.37	0.10	30(1)	0.20	<0.10	<0.10	0.10	6351268
Surrogate Recovery (%)									
O-TERPHENYL (sur.)	%	104		95		99	98		6351268
Volatiles									
Benzene	mg/L	<0.00040	0.00040	0.80	0.040	<0.00040		0.00040	6349515
Toluene	mg/L	<0.00040	0.00040	2.0	0.040	<0.00040		0.00040	6349515
Ethylbenzene	mg/L	0.00073	0.00040	0.54	0.040	<0.00040		0.00040	6349515
o-Xylene	mg/L	<0.00040	0.00040	0.75	0.040	<0.00040		0.00040	6349515
m & p-Xylene	mg/L	<0.00080	0.00080	1.6	0.080	<0.00080		0.00080	6349515
Xylenes (Total)	mg/L	<0.00080	0.00080	2.4	0.080	<0.00080		0.00080	6349515
F1 (C6-C10) - BTEX	mg/L	<0.10	0.10	<10	10	<0.10		0.10	6349515
(C6-C10)	mg/L	<0.10	0.10	15	10	<0.10		0.10	6349515
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	106		108		107			6349515
4-BROMOFLUOROBENZENE (sur.)	%	103		94		92			6349515
D4-1,2-DICHLOROETHANE (sur.)	%	109		81		85			6349515

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

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

AT1 BTEX AND F1 (WATER)

Maxxam ID		FA1164		
Sampling Date		2012/11/13 11:00		
	UNITS	**MW10-1**	**RDL**	**QC Batch**
Volatiles				
Benzene	mg/L	<0.00040	0.00040	6349515
Toluene	mg/L	0.00091	0.00040	6349515
Ethylbenzene	mg/L	<0.00040	0.00040	6349515
o-Xylene	mg/L	<0.00040	0.00040	6349515
m & p-Xylene	mg/L	<0.00080	0.00080	6349515
Xylenes (Total)	mg/L	<0.00080	0.00080	6349515
F1 (C6-C10) - BTEX	mg/L	<0.10	0.10	6349515
(C6-C10)	mg/L	<0.10	0.10	6349515
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	107		6349515
4-BROMOFLUOROBENZENE (sur.)	%	102		6349515
D4-1,2-DICHLOROETHANE (sur.)	%	104		6349515

RDL = Reportable Detection Limit

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		FA1130	FA1144		FA1150		FA1158		FA1162		
Sampling Date		2012/11/12 16:00	2012/11/12 16:25		2012/11/12 17:35		2012/11/12 18:10		2012/11/12 18:50		
	UNITS	**MW4B**	**MW4A**	**RDL**	**MW1A**	**RDL**	**MW2A**	**RDL**	**MW2B**	**RDL**	**QC Batch**
Polycyclic Aromatics											
Benzo[a]pyrene equivalency	ug/L	0.46	0.022	0.010	1.1	0.010	<0.010	0.010	130	0.010	6347946
Acenaphthene	mg/L	0.00083	<0.00010	0.00010	0.0083	0.00010	<0.00010	0.00010	0.88	0.010	6351265
Acenaphthylene	mg/L	<0.00010	<0.00010	0.00010	0.0012	0.00010	<0.00010	0.00010	0.078	0.010	6351265
Acridine	mg/L	<0.00020	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	<0.020	0.020	6351265
Anthracene	mg/L	0.00021	0.000027	0.000010	0.00072	0.000010	<0.000010	0.000010	0.29	0.0010	6351265
Benzo(a)anthracene	mg/L	0.00041	0.000013	0.0000085	0.00047	0.0000085	<0.0000085	0.0000085	0.14	0.00085	6351265
Benzo(b&j)fluoranthene	mg/L	0.00038	0.000018	0.0000085	0.00085	0.0000085	<0.0000085	0.0000085	0.11	0.00085	6351265
Benzo(k)fluoranthene	mg/L	0.00014	<0.0000085	0.0000085	0.00030	0.0000085	<0.0000085	0.0000085	0.042	0.00085	6351265
Benzo(g,h,i)perylene	mg/L	0.00011	0.000010	0.0000085	0.00048	0.0000085	<0.0000085	0.0000085	0.045	0.00085	6351265
Benzo(c)phenanthrene	mg/L	0.000051	<0.000050	0.000050	0.000071	0.000050	<0.000050	0.000050	0.017	0.0050	6351265
Benzo(a)pyrene	mg/L	0.00032	0.000014	0.0000075	0.00075	0.0000075	<0.0000075	0.0000075	0.081	0.00075	6351265
Benzo[e]pyrene	mg/L	0.00035	<0.000050	0.000050	0.00059	0.000050	<0.000050	0.000050	0.058	0.0050	6351265
Chrysene	mg/L	0.00029	0.000015	0.0000085	0.00027	0.0000085	<0.0000085	0.0000085	0.080	0.00085	6351265
Dibenz(a,h)anthracene	mg/L	0.000031	<0.0000075	0.0000075	0.00013	0.0000075	<0.0000075	0.0000075	0.012	0.00075	6351265
Fluoranthene	mg/L	0.0011	0.000076	0.000040	0.0022	0.000040	<0.000040	0.000040	0.65	0.0040	6351265
Fluorene	mg/L	0.00079	<0.000050	0.000050	0.0024	0.000050	<0.000050	0.000050	0.65	0.0050	6351265
Indeno(1,2,3-cd)pyrene	mg/L	0.000076	<0.0000085	0.0000085	0.00040	0.0000085	<0.0000085	0.0000085	0.038	0.00085	6351265
2-Methylnaphthalene	mg/L	0.00011	<0.00010	0.00010	0.041	0.00010	<0.00010	0.00010	1.6	0.010	6351265
Naphthalene	mg/L	0.0018	<0.00010	0.00010	0.89(1)	0.010	<0.00010	0.00010	13(1)	0.10	6351265
Phenanthrene	mg/L	0.00066	0.00013	0.000050	0.0025	0.000050	<0.000050	0.000050	1.5	0.0050	6351265
Perylene	mg/L	0.000058	<0.000050	0.000050	0.00017	0.000050	<0.000050	0.000050	0.026	0.0050	6351265
Pyrene	mg/L	0.0010	0.00013	0.000020	0.0030	0.000020	<0.000020	0.000020	0.48	0.0020	6351265
Quinoline	mg/L	<0.00020	<0.00020	0.00020	0.0030	0.00020	<0.00020	0.00020	<0.029	0.029	6351265
Surrogate Recovery (%)											
D10-ANTHRACENE (sur.)	%	120	129		124		123		128		6351265
D12-BENZO(A)PYRENE (sur.)	%	130	138(2)		130		130		130		6351265
D8-ACENAPHTHYLENE (sur.)	%	127	129		129		130		108		6351265
TERPHENYL-D14 (sur.)	%	126	130		127		125		137(2)		6351265

RDL = Reportable Detection Limit
(1) - Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		FA1163		FA1165		FA1166		FA1167		FA1168		
Sampling Date		2012/11/13 09:55		2012/11/13 11:35		2012/11/13 12:30		2012/11/13 13:40		2012/11/13 14:30		
	UNITS	**MW3A**	**RDL**	**MW11-01A**	**RDL**	**MW10-16**	**RDL**	**MW10-7A**	**RDL**	**MW10-18**	**RDL**	**QC Batch**
Polycyclic Aromatics												
Benzo[a]pyrene equivalency	ug/L	0.025	0.010	200	0.010	0.032	0.010	0.068	0.010	0.025	0.010	6347946
Acenaphthene	mg/L	0.00015	0.00010	0.71	0.010	0.00014	0.00010	0.040	0.00010	0.0065	0.00010	6351265
Acenaphthylene	mg/L	<0.00010	0.00010	0.036	0.010	<0.00010	0.00010	0.0029	0.00010	0.00015	0.00010	6351265
Acridine	mg/L	<0.00020	0.00020	<0.020	0.020	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	6351265
Anthracene	mg/L	0.000030	0.000010	0.42	0.0010	0.000070	0.000010	0.00068	0.000010	0.000048	0.000010	6351265
Benzo(a)anthracene	mg/L	0.000010	0.0000085	0.25	0.00085	0.000022	0.0000085	0.00015	0.0000085	0.000013	0.0000085	6351265
Benzo(b&j)fluoranthene	mg/L	0.000019	0.0000085	0.16	0.00085	0.000025	0.0000085	0.000055	0.0000085	0.000023	0.0000085	6351265
Benzo(k)fluoranthene	mg/L	<0.0000085	0.0000085	0.066	0.00085	0.000013	0.0000085	0.000022	0.0000085	<0.0000085	0.0000085	6351265
Benzo(g,h,i)perylene	mg/L	0.000021	0.0000085	0.055	0.00085	<0.000014(1)	0.000014	0.000011	0.0000085	0.000012	0.0000085	6351265
Benzo(c)phenanthrene	mg/L	<0.000050	0.000050	0.029	0.0050	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050	6351265
Benzo(a)pyrene	mg/L	0.000016	0.0000075	0.13	0.00075	0.000021	0.0000075	0.000040	0.0000075	0.000016	0.0000075	6351265
Benzo[e]pyrene	mg/L	<0.000050	0.000050	0.087	0.0050	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050	6351265
Chrysene	mg/L	<0.0000085	0.0000085	0.12	0.00085	0.000024	0.0000085	0.00012	0.0000085	0.000014	0.0000085	6351265
Dibenz(a,h)anthracene	mg/L	<0.0000075	0.0000075	0.017	0.00075	<0.0000075	0.0000075	<0.0000075	0.0000075	<0.0000075	0.0000075	6351265
Fluoranthene	mg/L	0.000048	0.000040	0.92	0.0040	0.00011	0.000040	0.0012	0.000040	0.000046	0.000040	6351265
Fluorene	mg/L	0.000066	0.000050	0.66	0.0050	0.00016	0.000050	0.012	0.000050	0.0011	0.000050	6351265
Indeno(1,2,3-cd)pyrene	mg/L	<0.000021(1)	0.000021	0.046	0.00085	<0.000018(1)	0.000018	<0.0000085	0.0000085	<0.0000085	0.0000085	6351265
2-Methylnaphthalene	mg/L	<0.00010	0.00010	1.2	0.010	0.00023	0.00010	0.060(2)	0.010	0.00015	0.00010	6351265
Naphthalene	mg/L	0.0017	0.00010	6.4(2)	0.10	0.00061	0.00010	3.8(2)	0.010	0.0086	0.00010	6351265
Phenanthrene	mg/L	0.000098	0.000050	1.8	0.0050	0.00050	0.000050	0.0052	0.000050	0.00015	0.000050	6351265
Perylene	mg/L	<0.000050	0.000050	0.035	0.0050	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050	6351265
Pyrene	mg/L	0.000065	0.000020	0.66	0.0020	0.00011	0.000020	0.00088	0.000020	0.000047	0.000020	6351265
Quinoline	mg/L	<0.00020	0.00020	<0.025	0.025	<0.00020	0.00020	<0.0027(1)	0.0027	<0.00020	0.00020	6351265
Surrogate Recovery (%)												
D10-ANTHRACENE (sur.)	%	119		123		123		123		127		6351265
D12-BENZO(A)PYRENE (sur.)	%	139(3)		125		140(3)		140(3)		139(3)		6351265
D8-ACENAPHTHYLENE (sur.)	%	128		114		129		130		130		6351265
TERPHENYL-D14 (sur.)	%	129		137(3)		128		127		130		6351265

RDL = Reportable Detection Limit
(1) - Detection limits raised due to matrix interference.
(2) - Detection limits raised due to dilution to bring analyte within the calibrated range.
(3) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		FA1169		FA1170		FA1171		FA1172	FA1172		
Sampling Date		2012/11/13 16:00		2012/11/13 16:40		2012/11/13		2012/11/13 15:10	2012/11/13 15:10		
	UNITS	**MW11-06**	**RDL**	**MW11-04A**	**RDL**	**DUP 1**	**RDL**	**MW11-03A**	**MW11-03A Lab-Dup**	**RDL**	**QC Batch**
Polycyclic Aromatics											
Benzo[a]pyrene equivalency	ug/L	7.6	0.010	<0.010	0.010	5.1	0.010	0.29		0.010	6347946
Acenaphthene	mg/L	0.32	0.010	0.043(1)	0.0010	0.24	0.010	0.0017	0.0016	0.00010	6351265
Acenaphthylene	mg/L	0.026	0.010	0.0013	0.00010	0.019	0.010	<0.00010	<0.00010	0.00010	6351265
Acridine	mg/L	<0.020	0.020	0.00033	0.00020	<0.020	0.020	<0.00020	<0.00020	0.00020	6351265
Anthracene	mg/L	0.061	0.0010	0.010	0.000010	0.043	0.0010	0.00090	0.00088	0.000010	6351265
Benzo(a)anthracene	mg/L	0.013	0.00085	<0.0000085	0.0000085	0.0088	0.00085	0.00038	0.00044	0.0000085	6351265
Benzo(b&j)fluoranthene	mg/L	0.0070	0.00085	<0.0000085	0.0000085	0.0045	0.00085	0.00022	0.00025	0.0000085	6351265
Benzo(k)fluoranthene	mg/L	0.0037	0.00085	<0.0000085	0.0000085	0.0025	0.00085	0.000080	0.000093	0.0000085	6351265
Benzo(g,h,i)perylene	mg/L	0.0021	0.00085	<0.0000085	0.0000085	0.0013	0.00085	0.00011	0.000094	0.0000085	6351265
Benzo(c)phenanthrene	mg/L	<0.0050	0.0050	<0.000050	0.000050	<0.0050	0.0050	0.000074	0.000083	0.000050	6351265
Benzo(a)pyrene	mg/L	0.0046	0.00075	<0.0000075	0.0000075	0.0030	0.00075	0.00017	0.00016	0.0000075	6351265
Benzo[e]pyrene	mg/L	<0.0050	0.0050	<0.000050	0.000050	<0.0050	0.0050	0.00015	0.00016	0.000050	6351265
Chrysene	mg/L	0.011	0.00085	<0.0000085	0.0000085	0.0059	0.00085	0.00021	0.00028	0.0000085	6351265
Dibenz(a,h)anthracene	mg/L	<0.00075	0.00075	<0.0000075	0.0000075	<0.00075	0.00075	0.000036	0.000025	0.0000075	6351265
Fluoranthene	mg/L	0.080	0.0040	0.0061	0.000040	0.053	0.0040	0.0029	0.0029	0.000040	6351265
Fluorene	mg/L	0.23	0.0050	0.038	0.000050	0.16	0.0050	0.0015	0.0014	0.000050	6351265
Indeno(1,2,3-cd)pyrene	mg/L	0.0016	0.00085	<0.0000085	0.0000085	0.0010	0.00085	0.000090	0.000078	0.0000085	6351265
2-Methylnaphthalene	mg/L	1.0	0.010	<0.00010	0.00010	0.84	0.010	0.00018	0.00014	0.00010	6351265
Naphthalene	mg/L	15(1)	0.10	0.0016	0.00010	11(1)	0.10	0.00049	0.00037	0.00010	6351265
Phenanthrene	mg/L	0.36	0.0050	0.013	0.000050	0.25	0.0050	0.0050	0.0050	0.000050	6351265
Perylene	mg/L	<0.0050	0.0050	<0.000050	0.000050	<0.0050	0.0050	<0.000050	0.000051	0.000050	6351265
Pyrene	mg/L	0.060	0.0020	0.0034	0.000020	0.040	0.0020	0.0021	0.0025	0.000020	6351265
Quinoline	mg/L	0.62	0.00020	<0.0017(2)	0.0017	0.64	0.00020	<0.00020	<0.00020	0.00020	6351265
Surrogate Recovery (%)											
D10-ANTHRACENE (sur.)	%	118		120		119		126	129		6351265
D12-BENZO(A)PYRENE (sur.)	%	127		139(3)		129		140(3)	139(3)		6351265
D8-ACENAPHTHYLENE (sur.)	%	92		121		97		125	105		6351265
TERPHENYL-D14 (sur.)	%	139(3)		129		134(3)		129	126		6351265

RDL = Reportable Detection Limit
(1) - Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) - Detection limits raised due to matrix interference.
(3) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		FA1130	FA1144	FA1150	FA1150	FA1158	FA1162	FA1163	FA1164	FA1165		
Sampling Date		2012/11/12 16:00	2012/11/12 16:25	2012/11/12 17:35	2012/11/12 17:35	2012/11/12 18:10	2012/11/12 18:50	2012/11/13 09:55	2012/11/13 11:00	2012/11/13 11:35		
	UNITS	**MW4B**	**MW4A**	**MW1A**	**MW1A Lab-Dup**	**MW2A**	**MW2B**	**MW3A**	**MW10-1**	**MW11-01A**	**RDL**	**QC Batch**
Volatiles												
Total Trihalomethanes	mg/L	<0.0020	<0.0020	<0.0020		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6346169
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6350121
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	6350121
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	6350121
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6350121
1,2-dibromoethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6350121
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Styrene	mg/L	<0.00050	<0.00050	0.0061	0.0062	<0.00050	0.025	<0.00050	<0.00050	0.0022	0.00050	6350121
1,1,1,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6350121
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6350121
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	6350121
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	6350121
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121

RDL = Reportable Detection Limit

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		FA1130	FA1144	FA1150	FA1150	FA1158	FA1162	FA1163	FA1164	FA1165		
Sampling Date		2012/11/12 16:00	2012/11/12 16:25	2012/11/12 17:35	2012/11/12 17:35	2012/11/12 18:10	2012/11/12 18:50	2012/11/13 09:55	2012/11/13 11:00	2012/11/13 11:35		
	UNITS	**MW4B**	**MW4A**	**MW1A**	**MW1A Lab-Dup**	**MW2A**	**MW2B**	**MW3A**	**MW10-1**	**MW11-01A**	**RDL**	**QC Batch**
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	0.019	0.019	<0.00050	0.16	<0.00050	<0.00050	0.17	0.00050	6350121
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	0.0083	0.0081	<0.00050	0.078	<0.00050	<0.00050	0.064	0.00050	6350121
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Surrogate Recovery (%)												
1,4-Difluorobenzene (sur.)	%	101	101	101	101	101	101	101	100	102		6350121
4-BROMOFLUOROBENZENE (sur.)	%	97	99	98	98	97	99	101	99	102		6350121
D4-1,2-DICHLOROETHANE (sur.)	%	90	94	86	96	93	90	91	86	91		6350121

RDL = Reportable Detection Limit

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		FA1166	FA1167	FA1168	FA1169	FA1170	FA1171	FA1172		
Sampling Date		2012/11/13 12:30	2012/11/13 13:40	2012/11/13 14:30	2012/11/13 16:00	2012/11/13 16:40	2012/11/13	2012/11/13 15:10		
	UNITS	**MW10-16**	**MW10-7A**	**MW10-18**	**MW11-06**	**MW11-04A**	**DUP 1**	**MW11-03A**	**RDL**	**QC Batch**
Volatiles										
Total Trihalomethanes	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6346169
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6350121
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	6350121
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	6350121
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6350121
1,2-dibromoethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6350121
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Styrene	mg/L	<0.00050	0.00074	<0.00050	0.22	<0.00050	0.22	<0.00050	0.00050	6350121
1,1,1,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6350121
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	6350121
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	6350121
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	6350121
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121

RDL = Reportable Detection Limit

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		FA1166	FA1167	FA1168	FA1169	FA1170	FA1171	FA1172		
Sampling Date		2012/11/13 12:30	2012/11/13 13:40	2012/11/13 14:30	2012/11/13 16:00	2012/11/13 16:40	2012/11/13	2012/11/13 15:10		
	UNITS	**MW10-16**	**MW10-7A**	**MW10-18**	**MW11-06**	**MW11-04A**	**DUP 1**	**MW11-03A**	**RDL**	**QC Batch**
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
1,2,4-trimethylbenzene	mg/L	<0.00050	0.11	<0.00050	0.27	<0.00050	0.29	<0.00050	0.00050	6350121
1,3,5-trimethylbenzene	mg/L	<0.00050	0.014	<0.00050	0.11	<0.00050	0.12	<0.00050	0.00050	6350121
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	6350121
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	100	101	101	104	101	101	101		6350121
4-BROMOFLUOROBENZENE (sur.)	%	100	102	101	112	99	106	99		6350121
D4-1,2-DICHLOROETHANE (sur.)	%	88	91	92	97	90	88	82		6350121

RDL = Reportable Detection Limit

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

Package 1	6.3°C
Package 2	6.0°C

Each temperature is the average of up to three cooler temperatures taken at receipt

AT1 BTEX AND F1-F2 (WATER) Comments

Sample FA1165-01 BTEX/F1 in Water by HS GC/MS: Detection limits raised due to sample matrix.

Sample FA1169-01 BTEX/F1 in Water by HS GC/MS: Detection limits raised due to sample matrix.

Sample FA1171-01 BTEX/F1 in Water by HS GC/MS: Detection limits raised due to sample matrix.

SEMIVOLATILE ORGANICS BY GC-MS (WATER) Comments

Sample FA1162-01 Polycyclic Aromatic Hydrocarbons: Detection limits raised due to matrix interference.

Sample FA1165-01 Polycyclic Aromatic Hydrocarbons: Detection limits raised due to matrix interference.

Sample FA1169-01 Polycyclic Aromatic Hydrocarbons: Detection limits raised due to matrix interference.

Sample FA1171-01 Polycyclic Aromatic Hydrocarbons: Detection limits raised due to matrix interference.

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6349515	1,4-Difluorobenzene (sur.)	2012/11/16	88	70 - 130	104	70 - 130	102	%		
6349515	4-BROMOFLUOROBENZENE (sur.)	2012/11/16	92	70 - 130	106	70 - 130	104	%		
6349515	D4-1,2-DICHLOROETHANE (sur.)	2012/11/16	94	70 - 130	104	70 - 130	105	%		
6349515	Benzene	2012/11/16	95	70 - 130	99	70 - 130	<0.00040	mg/L	NC	40
6349515	Toluene	2012/11/16	95	70 - 130	102	70 - 130	<0.00040	mg/L	NC	40
6349515	Ethylbenzene	2012/11/16	94	70 - 130	103	70 - 130	<0.00040	mg/L	NC	40
6349515	o-Xylene	2012/11/16	97	70 - 130	106	70 - 130	<0.00040	mg/L	NC	40
6349515	m & p-Xylene	2012/11/16	98	70 - 130	108	70 - 130	<0.00080	mg/L	NC	40
6349515	(C6-C10)	2012/11/16	88	70 - 130	93	70 - 130	<0.10	mg/L	NC	40
6349515	Xylenes (Total)	2012/11/16					<0.00080	mg/L	NC	40
6349515	F1 (C6-C10) - BTEX	2012/11/16					<0.10	mg/L	NC	40
6350121	1,4-Difluorobenzene (sur.)	2012/11/16	102	70 - 130	100	70 - 130	102	%		
6350121	4-BROMOFLUOROBENZENE (sur.)	2012/11/16	105	70 - 130	102	70 - 130	98	%		
6350121	D4-1,2-DICHLOROETHANE (sur.)	2012/11/16	92	70 - 130	104	70 - 130	101	%		
6350121	Bromodichloromethane	2012/11/16	87	70 - 130	91	70 - 130	<0.00050	mg/L	NC	40
6350121	Bromoform	2012/11/16	85	70 - 130	96	70 - 130	<0.00050	mg/L	NC	40
6350121	Bromomethane	2012/11/16	71	70 - 130	75	70 - 130	<0.0020	mg/L	NC	40
6350121	Carbon tetrachloride	2012/11/16	94	70 - 130	93	70 - 130	<0.00050	mg/L	NC	40
6350121	Chlorobenzene	2012/11/16	85	70 - 130	84	70 - 130	<0.00050	mg/L	NC	40
6350121	Chlorodibromomethane	2012/11/16	89	70 - 130	96	70 - 130	<0.0010	mg/L	NC	40
6350121	Chloroethane	2012/11/16	76	70 - 130	78	70 - 130	<0.0010	mg/L	NC	40
6350121	Chloroform	2012/11/16	84	70 - 130	86	70 - 130	<0.00050	mg/L	NC	40
6350121	Chloromethane	2012/11/16	71	70 - 130	76	70 - 130	<0.0020	mg/L	NC	40
6350121	1,2-dibromoethane	2012/11/16	81	70 - 130	91	70 - 130	<0.00050	mg/L	NC	40
6350121	1,2-dichlorobenzene	2012/11/16	85	70 - 130	90	70 - 130	<0.00050	mg/L	NC	40
6350121	1,3-dichlorobenzene	2012/11/16	85	70 - 130	86	70 - 130	<0.00050	mg/L	NC	40
6350121	1,4-dichlorobenzene	2012/11/16	85	70 - 130	86	70 - 130	<0.00050	mg/L	NC	40
6350121	1,1-dichloroethane	2012/11/16	92	70 - 130	93	70 - 130	<0.00050	mg/L	NC	40
6350121	1,2-dichloroethane	2012/11/16	83	70 - 130	94	70 - 130	<0.00050	mg/L	NC	40
6350121	1,1-dichloroethene	2012/11/16	93	70 - 130	90	70 - 130	<0.00050	mg/L	NC	40
6350121	cis-1,2-dichloroethene	2012/11/16	87	70 - 130	89	70 - 130	<0.00050	mg/L	NC	40
6350121	trans-1,2-dichloroethene	2012/11/16	89	70 - 130	87	70 - 130	<0.00050	mg/L	NC	40
6350121	Dichloromethane	2012/11/16	84	70 - 130	89	70 - 130	<0.0020	mg/L	NC	40
6350121	1,2-dichloropropane	2012/11/16	84	70 - 130	87	70 - 130	<0.00050	mg/L	NC	40
6350121	cis-1,3-dichloropropene	2012/11/16	92	70 - 130	98	70 - 130	<0.00050	mg/L	NC	40
6350121	trans-1,3-dichloropropene	2012/11/16	78	70 - 130	85	70 - 130	<0.00050	mg/L	NC	40
6350121	Methyl methacrylate	2012/11/16	81	70 - 130	94	70 - 130	<0.00050	mg/L	NC	40
6350121	Methyl-tert-butylether(MTBE)	2012/11/16	85	70 - 130	88	70 - 130	<0.00050	mg/L	NC	40
6350121	Styrene	2012/11/16	99	70 - 130	90	70 - 130	<0.00050	mg/L	2.4	40
6350121	1,1,1,2-tetrachloroethane	2012/11/16	92	70 - 130	92	70 - 130	<0.0020	mg/L	NC	40

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6350121	1,1,2,2-tetrachloroethane	2012/11/16	81	70 - 130	91	70 - 130	<0.0020	mg/L	NC	40
6350121	Tetrachloroethene	2012/11/16	92	70 - 130	87	70 - 130	<0.00050	mg/L	NC	40
6350121	1,2,3-trichlorobenzene	2012/11/16	83	70 - 130	86	70 - 130	<0.0010	mg/L	NC	40
6350121	1,2,4-trichlorobenzene	2012/11/16	86	70 - 130	83	70 - 130	<0.0010	mg/L	NC	40
6350121	1,3,5-trichlorobenzene	2012/11/16	87	70 - 130	83	70 - 130	<0.00050	mg/L	NC	40
6350121	1,1,1-trichloroethane	2012/11/16	95	70 - 130	93	70 - 130	<0.00050	mg/L	NC	40
6350121	1,1,2-trichloroethane	2012/11/16	85	70 - 130	93	70 - 130	<0.00050	mg/L	NC	40
6350121	Trichloroethene	2012/11/16	89	70 - 130	85	70 - 130	<0.00050	mg/L	NC	40
6350121	Trichlorofluoromethane	2012/11/16	83	70 - 130	82	70 - 130	<0.00050	mg/L	NC	40
6350121	1,2,4-trimethylbenzene	2012/11/16	85	70 - 130	86	70 - 130	<0.00050	mg/L	2.0	40
6350121	1,3,5-trimethylbenzene	2012/11/16	92	70 - 130	93	70 - 130	<0.00050	mg/L	2.6	40
6350121	Vinyl chloride	2012/11/16	80	70 - 130	74	70 - 130	<0.00050	mg/L	NC	40
6351265	D10-ANTHRACENE (sur.)	2012/11/18	123	50 - 130	124	50 - 130	124	%		
6351265	D12-BENZO(A)PYRENE (sur.)	2012/11/18	140(1)	50 - 130	134(1)	50 - 130	136(1)	%		
6351265	D8-ACENAPHTHYLENE (sur.)	2012/11/18	129	50 - 130	130	50 - 130	129	%		
6351265	TERPHENYL-D14 (sur.)	2012/11/18	130	50 - 130	128	50 - 130	130	%		
6351265	Acenaphthene	2012/11/18	110	50 - 130	96	50 - 130	<0.00010	mg/L	3.9	40
6351265	Acenaphthylene	2012/11/18	102	50 - 130	105	50 - 130	<0.00010	mg/L	NC	40
6351265	Acridine	2012/11/18	108	50 - 130	101	50 - 130	<0.00020	mg/L	NC	40
6351265	Anthracene	2012/11/18	100	50 - 130	91	50 - 130	<0.000010	mg/L	2.6	40
6351265	Benzo(a)anthracene	2012/11/18	119	50 - 130	108	50 - 130	<0.0000085	mg/L	14.2	40
6351265	Benzo(b&j)fluoranthene	2012/11/18	112	50 - 130	94	50 - 130	<0.0000085	mg/L	15.2	40
6351265	Benzo(k)fluoranthene	2012/11/18	100	50 - 130	101	50 - 130	<0.0000085	mg/L	15.1	40
6351265	Benzo(g,h,i)perylene	2012/11/18	118	50 - 130	107	50 - 130	<0.0000085	mg/L	12.3	40
6351265	Benzo(c)phenanthrene	2012/11/18	111	50 - 130	105	50 - 130	<0.000050	mg/L	NC	40
6351265	Benzo(a)pyrene	2012/11/18	126	50 - 130	105	50 - 130	<0.0000075	mg/L	4.7	40
6351265	Benzo[e]pyrene	2012/11/18	113	50 - 130	102	50 - 130	<0.000050	mg/L	NC	40
6351265	Chrysene	2012/11/18	106	50 - 130	101	50 - 130	<0.0000085	mg/L	27.8	40
6351265	Dibenz(a,h)anthracene	2012/11/18	126	50 - 130	113	50 - 130	<0.0000075	mg/L	NC	40
6351265	Fluoranthene	2012/11/18	120	50 - 130	104	50 - 130	<0.000040	mg/L	1.4	40
6351265	Fluorene	2012/11/18	110	50 - 130	101	50 - 130	<0.000050	mg/L	9.2	40
6351265	Indeno(1,2,3-cd)pyrene	2012/11/18	122	50 - 130	109	50 - 130	<0.0000085	mg/L	13.2	40
6351265	2-Methylnaphthalene	2012/11/18	99	50 - 130	94	50 - 130	<0.00010	mg/L	NC	40
6351265	Naphthalene	2012/11/18	107	50 - 130	85	50 - 130	<0.00010	mg/L	NC	40
6351265	Phenanthrene	2012/11/18	112	50 - 130	98	50 - 130	<0.000050	mg/L	0.4	40
6351265	Perylene	2012/11/18	104	50 - 130	95	50 - 130	<0.000050	mg/L	NC	40
6351265	Pyrene	2012/11/18	124	50 - 130	102	50 - 130	<0.000020	mg/L	14.3	40
6351265	Quinoline	2012/11/18	71	50 - 130	74	50 - 130	<0.00020	mg/L	NC	40

Maxxam Job #: B2A3967
Report Date: 2012/11/21

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164, CANADA CREOSOTE
Site Location: CALGARY, NW
Sampler Initials: BMS

QUALITY ASSURANCE REPORT

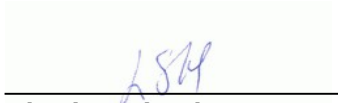
			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6351268	O-TERPHENYL (sur.)	2012/11/17	97	50 - 130	104	50 - 130	97	%		
6351268	F2 (C10-C16 Hydrocarbons)	2012/11/17	96	50 - 130	101	70 - 130	<0.10	mg/L	NC	40

N/A = Not Applicable
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Validation Signature Page

Maxxam Job #: B2A3967

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



Luba Shymushovska, Senior Analyst, Organic Department

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

Maxxam

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247
Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 577-7100, Fax: (780) 450-4187, Toll free: (877) 465-8889
www.maxxamanalytics.com

Chain of Custody

A213718

Page: 1 of 2

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☒	Report Distribution (E-Mail):
Company:	GOLDER ASSOCIATES		JBurghardt@golder.com
Contact:	JULIE. BURGHARDT		BSammons@golder.com
Address:	102-2535-3rd AVE SE, CALGARY		NBaumann@golder.com
	Prov: AB. PC:	Prov: PC:	
Contact #s:	Ph: 403 299 5600 Cell:	Ph: Cell:	

REGULATORY GUIDELINES:
☐ AT1
☐ CCME
☐ Regulated Drinking Water
☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:	11-1324-0164
Project # / Name:	CANADA CREOSOTE.
Site Location:	CALGARY, NW.
Quote #:	
Sampled By:	BMS

SERVICE REQUESTED: ☐ RUSH (Contact lab to reserve) Date Required: ☒ REGULAR (5 to 7 Days)

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: BTEX F1-F4	SOIL: Sieve (75 micron)	SOIL: Regulated Metals (CCME / AT1)	SOIL: Salinity 4	SOIL: Assessment ICP Metals	SOIL: Basic Class II Landfill	WATER: ☒ VOCs ☐ BTEX F1-F2	WATER: ☐ BTEX F1-F4 ☐ BTEX F1-F2	WATER: ☐ Routine Water ☐ Turb ☐ F	WATER: ☐ TOC ☐ DOC	WATER: Regulated Metals (CCME / AT1) Total	WATER: Regulated Metals (CCME / AT1) Dissolved	WATER: Mercury ☐ Total ☐ Dissolved	Other Analysis: ☒ PAH's	HOLD - Do not Analyze	# of Containers Submitted
1	MW4B		GW	12/11/12 16:00							X							X		7
2	MW4A			12/11/12 16:25							X							X		7
3	MW1A			12/11/12 17:35							X							X		7
4	MW2A			12/11/12 18:10							X							X		7
5	MW2B			12/11/12 18:50							X							X		7
6	MW3A			12/11/13 09:55							X							X		7
7	MW10-1			12/11/13 11:00							X							X		1 *
8	MW11-01A			12/11/13 11:35							X							X		7
9	MW10-16			12/11/13 12:30							X							X		7
10	MW10-7A			12/11/13 13:40							X							X		7
11	MW10-18			12/11/13 14:30							X							X		7
12	MW11-06			12/11/13 16:00							X							X		7
																				F/P

1X250mL is NOT 100% Full.

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished By (Signature/Print): BRITTNEY SAMMONS Date (YY/MM/DD): 12/11/13 Time (24:00): 18:00

Relinquished By (Signature/Print): Date (YY/MM/DD): Time (24:00):

Special Instructions:
*MW10-1 only 1x40mL vial. PLEASE RUN WHAT YOU CAN AND INDICATE INSUFFICIENT SAMPLE FOR REST OF ANALYSES THAT WERE UNABLE TO RUN.

# of Jars Used & Not Submitted

LAB USE ONLY

Received By: Date: 2012/11/13 Time: 1825

Maxxam Job #: B2A3967

Lab Comments:

	Custody Seal	Temperature	Ice
	N	7 66	Y
	N	7 65	Y

Maxxam

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www.maxxamanalytics.com

Chain of Custody

A213719

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☒	Report Distribution (E-Mail):	REGULATORY GUIDELINES:
Company:	GOLDER ASSOC.		JBurghardt@golder.com	☐ AT1
Contact:			BSammons@golder.com	☐ CCME
Address:	SAME AS PG 1.		NBaumann@golder.com	☐ Regulated Drinking Water
	Prov: PC:	Prov: PC:		☐ Other:
Contact #s:	Ph: Cell:	Ph: Cell:		

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:	☒ 11-1324-0164
Project # / Name:	CANADA CREOSOTE
Site Location:	CALGARY, NW.
Quote #:	
Sampled By:	BMS

SERVICE REQUESTED: ☐ **RUSH** (Contact lab to reserve) **Date Required:** ☒ REGULAR (5 to 7 Days)

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: BTEX F1-F4	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals	Basic Class II Landfill	WATER: ☒ BTEX F1 + VOCs	☐ BTEX F1-F2	☐ BTEX F1-F4	☐ Routine Water ☐ Turb ☐ F	☐ TOC ☐ DOC	Regulated Metals (CCME / AT1) Total	Dissolved	Mercury	☐ Total ☐ Dissolved	Other Analysis: PAHs	HOLD - Do not Analyze	# of Containers Submitted
1	MW11-04A		GW	12/11/13 16:40							X									X		7
2	DUP 1		GW	12/11/13 –							X									X		7
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Please indicate Filtered, Preserved or Both (F, P, F/P) → F/P

Relinquished By (Signature/Print): BRITNEY SAMMONS	Date (YY/MM/DD): NOV 13, 2012	Time (24:00): 1800
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Special Instructions:		# of Jars Used & Not Submitted

LAB USE ONLY

Received By: Brandon Kruger	Date: 2012/11/13	Time: 15:05	Maxxam Job #: B2A3967		
Lab Comments:			Custody Seal	Temperature	Ice
			~	7.66	7
			~	7.65	7

Anna Gordon

From: Sammons, Brittney <Brittney_Sammons@golder.com>
Sent: November-14-12 5:01 PM
To: Anna Gordon
Cc: Baumann, Niki; Burghardt, Julie
Subject: RE: Sample Submission

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: [CRM] Regarding: Golder FLAG

Anna,

To clear up any confusion:

- Sample MW10-16: A full suite was submitted for this sample location; however, one of the 250 mL amber bottles was only 98% full. A substantial air pocket was visible but I expect that you can still run the full set of analyses.
- Sample MW10-1: only 1x 40 mL vial was submitted. Please run BTEX F1 and VOCs as a priority.
- Please add MW11-03A to the COC for the same analyses (BTEX F1, F2, VOCs and PAHs).

Call me on my cell if you have any questions.

Thanks,
Brittney

Brittney Sammons (B.E.S.) | Environmental Technician | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 532 5738 | **F:** +1 (403) 299 5606 | **C:** +1 (403) 880 7614
E: Brittney_Sammons@golder.com | **www.golder.com**

Work Safe, Home Safe

From: Anna Gordon [mailto:AGordon@maxxam.ca]
Sent: Wednesday, November 14, 2012 4:25 PM
To: Burghardt, Julie
Cc: Sammons, Brittney; Baumann, Niki
Subject: Sample Submission

Hello!

I left a voicemail with Julie about this.
I have a couple questions about the submission we received yesterday at 6pm. (Project Canada Creosote)

1

CERTIFICATE OF ANALYSIS

REPORTED TO	Golder Associates Ltd. (Calgary) 102-2535 3rd Avenue SE Calgary, AB T2A 7W5	**TEL** **FAX**	1-403-532-5798 1-403-299-5606
ATTENTION	Julie Burghardt		

WORK ORDER	3041469		
PO NUMBER	11-1324-0164	**RECEIVED / TEMP**	Apr-29-13 11:58 / 28.0 °C
PROJECT	11-1324-0164	**REPORTED**	May-13-13
PROJECT INFO	Canada Creosote	**COC NUMBER**	B03516

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Issued By: **Paul Thandi, B.Sc., PChem**
Client Service Coordinator, Richmond

Please contact CARO if more information is needed or to provide feedback on our services.

Locations:

#110 4011 Viking Way
Richmond, BC V6V 2K9
Tel: 604-279-1499 Fax: 604-279-1599

#102 3677 Highway 97N
Kelowna, BC V1X 5C3
Tel: 250-765-9646 Fax: 250-765-3893

17225 109 Avenue
Edmonton, AB T5S 1H7
Tel: 780-489-9100 Fax: 780-489-9700

www.caro.ca

ANALYSIS INFORMATION

REPORTED TO	Golder Associates Ltd. (Calgary)	**WORK ORDER**	3041469
PROJECT	11-1324-0164	**REPORTED**	May-13-13

Analysis Description	Method Reference (* = modified from) Preparation	Analysis	Location
Soil Vapour (VOC+VH+Fractions) Pkg	N/A	[CALC]	Richmond
Vapour Analysis (Aromatics)	N/A	EPA TO-17 (1999)	Richmond
Vapour Analysis (VHv)	N/A	BCMOE	Richmond
Vapour Analysis (VOC)	N/A	EPA TO-17 (1999)	Richmond
Vapour Hydrocarbon Fractionation	N/A	In-House	Richmond

Note: The numbers in brackets represent the year that the method was published/approved

Method Reference Descriptions:

BCMOE	British Columbia Environmental Laboratory Manual, 2009, British Columbia Ministry of Environment
In-House	Other-Please Contact CARO
EPA	United States Environmental Protection Agency Test Methods

Glossary of Terms:

MRL	Method Reporting Limit
<	Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
ug/m3	Micrograms per cubic meter of air

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-11 Well (3041469-01) [Air] Sampled: Apr-24-13 11:30 To Apr-24-13 11:45						
Sampling Flow: 198 mL/min	Sampling Time: 15 min					
Aggregate Organic Parameters						
nC6-nC8 (total)	< 170	170	ug/m3	N/A	May-04-13	
nC6-nC8 (aromatic)	< 3.4	3.4	ug/m3	N/A	N/A	
nC6-nC8 (non-aromatic)	< 170	170	ug/m3	N/A	N/A	
nC8-nC10 (total)	**440**	170	ug/m3	N/A	May-04-13	
nC8-nC10 (aromatic)	**7.4**	3.4	ug/m3	N/A	N/A	
nC8-nC10 (non-aromatic)	**440**	170	ug/m3	N/A	N/A	
nC6-nC10 (total)	**540**	340	ug/m3	N/A	May-04-13	
nC10-nC12 (total)	**400**	170	ug/m3	N/A	May-04-13	
nC10-nC12 (aromatic)	< 3.4	3.4	ug/m3	N/A	N/A	
nC10-nC12 (non-aromatic)	**400**	170	ug/m3	N/A	N/A	
nC12-nC16 (total)	< 340	340	ug/m3	N/A	May-04-13	
nC12-nC16 (aromatic)	< 3.4	3.4	ug/m3	N/A	N/A	
nC12-nC16 (non-aromatic)	< 340	340	ug/m3	N/A	N/A	
nC10-nC16 (total)	**610**	340	ug/m3	N/A	May-04-13	
VHv (6-13)	**910**	670	ug/m3	N/A	May-04-13	
VPHv	**910**	670	ug/m3	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.4	3.4	ug/m3	N/A	May-04-13	
Acrylonitrile	< 0.34	0.34	ug/m3	N/A	May-04-13	
Allyl chloride	< 0.34	0.34	ug/m3	N/A	May-04-13	
Benzene	< 0.67	0.67	ug/m3	N/A	May-04-13	
Bromobenzene	< 0.34	0.34	ug/m3	N/A	May-04-13	
Bromodichloromethane	< 0.34	0.34	ug/m3	N/A	May-04-13	
Bromoform	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,3-Butadiene	< 1.4	1.4	ug/m3	N/A	May-04-13	
2-Butanone (MEK)	< 1.7	1.7	ug/m3	N/A	May-04-13	
Carbon disulfide	< 3.4	3.4	ug/m3	N/A	May-04-13	
Carbon tetrachloride	< 0.34	0.34	ug/m3	N/A	May-04-13	
Chlorobenzene	< 0.34	0.34	ug/m3	N/A	May-04-13	
Chloroethane	< 1.7	1.7	ug/m3	N/A	May-04-13	
Chloroform	**8.4**	0.34	ug/m3	N/A	May-04-13	
2-Chlorotoluene	< 0.67	0.67	ug/m3	N/A	May-04-13	
n-Decane	< 1.0	1.0	ug/m3	N/A	May-04-13	
1,2-Dibromo-3-chloropropane	< 0.34	0.34	ug/m3	N/A	May-04-13	
Dibromochloromethane	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,2-Dibromoethane	< 0.34	0.34	ug/m3	N/A	May-04-13	
Dibromomethane	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,2-Dichlorobenzene	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,3-Dichlorobenzene	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,4-Dichlorobenzene	< 0.34	0.34	ug/m3	N/A	May-04-13	
Dichlorodifluoromethane	**4.7**	0.67	ug/m3	N/A	May-04-13	
1,1-Dichloroethane	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,2-Dichloroethane	< 0.20	0.20	ug/m3	N/A	May-04-13	
1,1-Dichloroethene	< 0.34	0.34	ug/m3	N/A	May-04-13	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-11 Well (3041469-01) [Air] Sampled: Apr-24-13 11:30 To Apr-24-13 11:45, Continued						
Sampling Flow: 198 mL/min	Sampling Time: 15 min					
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.34	0.34	ug/m3	N/A	May-04-13	
trans-1,2-Dichloroethene	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,2-Dichloropropane	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,3-Dichloropropane	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,3-Dichloropropene	< 0.67	0.67	ug/m3	N/A	May-04-13	
Ethyl acetate	< 1.7	1.7	ug/m3	N/A	May-04-13	
Ethylbenzene	**1.0**	0.34	ug/m3	N/A	May-04-13	
Ethyl ether	< 0.67	0.67	ug/m3	N/A	May-04-13	
Hexachlorobutadiene	< 0.34	0.34	ug/m3	N/A	May-04-13	
Ethyl methacrylate	< 0.34	0.34	ug/m3	N/A	May-04-13	
Hexachloroethane	< 1.4	1.4	ug/m3	N/A	May-04-13	
n-Hexane	< 3.4	3.4	ug/m3	N/A	May-04-13	
Isopropylbenzene (Cumene)	< 0.34	0.34	ug/m3	N/A	May-04-13	
Methacrylonitrile	< 0.34	0.34	ug/m3	N/A	May-04-13	
Methyl acrylate	< 1.7	1.7	ug/m3	N/A	May-04-13	
Methyl cyclohexane	< 0.67	0.67	ug/m3	N/A	May-04-13	
Methyl tert-butyl ether	< 0.67	0.67	ug/m3	N/A	May-04-13	
Methylene chloride	< 3.4	3.4	ug/m3	N/A	May-04-13	
Methyl methacrylate	< 0.67	0.67	ug/m3	N/A	May-04-13	
4-Methyl-2-Pentanone (MIBK)	< 0.67	0.67	ug/m3	N/A	May-04-13	
Naphthalene	< 0.34	0.34	ug/m3	N/A	May-04-13	
Nitrobenzene	< 0.34	0.34	ug/m3	N/A	May-04-13	
Styrene	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,1,1,2-Tetrachloroethane	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,1,2,2-Tetrachloroethane	< 0.24	0.24	ug/m3	N/A	May-04-13	
Tetrachloroethene	< 1.7	1.7	ug/m3	N/A	May-04-13	
Tetrahydrofuran	< 0.34	0.34	ug/m3	N/A	May-04-13	
Toluene	< 3.4	3.4	ug/m3	N/A	May-04-13	
1,2,4-Trichlorobenzene	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,1,1-Trichloroethane	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.67	0.67	ug/m3	N/A	May-04-13	
1,1,2-Trichloroethane	< 0.34	0.34	ug/m3	N/A	May-04-13	
Trichloroethene	< 0.17	0.17	ug/m3	N/A	May-04-13	
Trichlorofluoromethane	**0.88**	0.34	ug/m3	N/A	May-04-13	
1,2,3-Trichloropropane	< 0.34	0.34	ug/m3	N/A	May-04-13	
1,2,4-Trimethylbenzene	**0.88**	0.67	ug/m3	N/A	May-04-13	
1,3,5-Trimethylbenzene	< 0.67	0.67	ug/m3	N/A	May-04-13	
Vinyl chloride	< 0.67	0.67	ug/m3	N/A	May-04-13	
Xylenes (total)	**5.4**	1.7	ug/m3	N/A	May-04-13	
Surrogate: Toluene-d8	*77 %*	*60-130*		*N/A*	*May-04-13*	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-16 Well A (3041469-02) [Air] Sampled: Apr-24-13 14:30 To Apr-24-13 14:45						
Sampling Flow: 150 mL/min	Sampling Time: 15 min					
Aggregate Organic Parameters						
nC6-nC8 (total)	< 220	220	ug/m3	N/A	May-04-13	
nC6-nC8 (aromatic)	< 4.4	4.4	ug/m3	N/A	N/A	
nC6-nC8 (non-aromatic)	< 220	220	ug/m3	N/A	N/A	
nC8-nC10 (total)	**1000**	220	ug/m3	N/A	May-04-13	
nC8-nC10 (aromatic)	**9.8**	4.4	ug/m3	N/A	N/A	
nC8-nC10 (non-aromatic)	**1000**	220	ug/m3	N/A	N/A	
nC6-nC10 (total)	**1200**	440	ug/m3	N/A	May-04-13	
nC10-nC12 (total)	**1100**	220	ug/m3	N/A	May-04-13	
nC10-nC12 (aromatic)	< 4.4	4.4	ug/m3	N/A	N/A	
nC10-nC12 (non-aromatic)	**1100**	220	ug/m3	N/A	N/A	
nC12-nC16 (total)	< 440	440	ug/m3	N/A	May-04-13	
nC12-nC16 (aromatic)	< 4.4	4.4	ug/m3	N/A	N/A	
nC12-nC16 (non-aromatic)	< 440	440	ug/m3	N/A	N/A	
nC10-nC16 (total)	**1500**	440	ug/m3	N/A	May-04-13	
VHv (6-13)	**2200**	890	ug/m3	N/A	May-04-13	
VPHv	**2200**	890	ug/m3	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 4.4	4.4	ug/m3	N/A	May-04-13	
Acrylonitrile	< 0.44	0.44	ug/m3	N/A	May-04-13	
Allyl chloride	< 0.44	0.44	ug/m3	N/A	May-04-13	
Benzene	< 0.89	0.89	ug/m3	N/A	May-04-13	
Bromobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
Bromodichloromethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
Bromoform	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,3-Butadiene	< 1.8	1.8	ug/m3	N/A	May-04-13	
2-Butanone (MEK)	< 2.2	2.2	ug/m3	N/A	May-04-13	
Carbon disulfide	< 4.4	4.4	ug/m3	N/A	May-04-13	
Carbon tetrachloride	< 0.44	0.44	ug/m3	N/A	May-04-13	
Chlorobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
Chloroethane	< 2.2	2.2	ug/m3	N/A	May-04-13	
Chloroform	**1.2**	0.44	ug/m3	N/A	May-04-13	
2-Chlorotoluene	< 0.89	0.89	ug/m3	N/A	May-04-13	
n-Decane	**2.8**	1.3	ug/m3	N/A	May-04-13	
1,2-Dibromo-3-chloropropane	< 0.44	0.44	ug/m3	N/A	May-04-13	
Dibromochloromethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,2-Dibromoethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
Dibromomethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,2-Dichlorobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,3-Dichlorobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,4-Dichlorobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
Dichlorodifluoromethane	**4.4**	0.89	ug/m3	N/A	May-04-13	
1,1-Dichloroethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,2-Dichloroethane	< 0.27	0.27	ug/m3	N/A	May-04-13	
1,1-Dichloroethene	< 0.44	0.44	ug/m3	N/A	May-04-13	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-16 Well A (3041469-02) [Air] Sampled: Apr-24-13 14:30 To Apr-24-13 14:45, Continued						
Sampling Flow: 150 mL/min	Sampling Time: 15 min					
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.44	0.44	ug/m3	N/A	May-04-13	
trans-1,2-Dichloroethene	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,2-Dichloropropane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,3-Dichloropropane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,3-Dichloropropene	< 0.89	0.89	ug/m3	N/A	May-04-13	
Ethyl acetate	< 2.2	2.2	ug/m3	N/A	May-04-13	
Ethylbenzene	**1.2**	0.44	ug/m3	N/A	May-04-13	
Ethyl ether	< 0.89	0.89	ug/m3	N/A	May-04-13	
Hexachlorobutadiene	< 0.44	0.44	ug/m3	N/A	May-04-13	
Ethyl methacrylate	< 0.44	0.44	ug/m3	N/A	May-04-13	
Hexachloroethane	< 1.8	1.8	ug/m3	N/A	May-04-13	
n-Hexane	< 4.4	4.4	ug/m3	N/A	May-04-13	
Isopropylbenzene (Cumene)	< 0.44	0.44	ug/m3	N/A	May-04-13	
Methacrylonitrile	< 0.44	0.44	ug/m3	N/A	May-04-13	
Methyl acrylate	< 2.2	2.2	ug/m3	N/A	May-04-13	
Methyl cyclohexane	< 0.89	0.89	ug/m3	N/A	May-04-13	
Methyl tert-butyl ether	< 0.89	0.89	ug/m3	N/A	May-04-13	
Methylene chloride	< 4.4	4.4	ug/m3	N/A	May-04-13	
Methyl methacrylate	< 0.89	0.89	ug/m3	N/A	May-04-13	
4-Methyl-2-Pentanone (MIBK)	< 0.89	0.89	ug/m3	N/A	May-04-13	
Naphthalene	**0.58**	0.44	ug/m3	N/A	May-04-13	
Nitrobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
Styrene	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,1,1,2-Tetrachloroethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,1,2,2-Tetrachloroethane	< 0.31	0.31	ug/m3	N/A	May-04-13	
Tetrachloroethene	**4.9**	2.2	ug/m3	N/A	May-04-13	
Tetrahydrofuran	< 0.44	0.44	ug/m3	N/A	May-04-13	
Toluene	< 4.4	4.4	ug/m3	N/A	May-04-13	
1,2,4-Trichlorobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,1,1-Trichloroethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.89	0.89	ug/m3	N/A	May-04-13	
1,1,2-Trichloroethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
Trichloroethene	**0.22**	0.22	ug/m3	N/A	May-04-13	
Trichlorofluoromethane	**0.98**	0.44	ug/m3	N/A	May-04-13	
1,2,3-Trichloropropane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,2,4-Trimethylbenzene	**2.5**	0.89	ug/m3	N/A	May-04-13	
1,3,5-Trimethylbenzene	< 0.89	0.89	ug/m3	N/A	May-04-13	
Vinyl chloride	< 0.89	0.89	ug/m3	N/A	May-04-13	
Xylenes (total)	**6.2**	2.2	ug/m3	N/A	May-04-13	
Surrogate: Toluene-d8	*90 %*	*60-130*		*N/A*	*May-04-13*	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-16 Well B (3041469-03) [Air] Sampled: Apr-24-13 14:30 To Apr-24-13 14:45						
Sampling Flow: 150 mL/min	Sampling Time: 15 min					
Aggregate Organic Parameters						
nC6-nC8 (total)	< 220	220	ug/m3	N/A	May-04-13	
nC6-nC8 (aromatic)	< 4.4	4.4	ug/m3	N/A	N/A	
nC6-nC8 (non-aromatic)	< 220	220	ug/m3	N/A	N/A	
nC8-nC10 (total)	**760**	220	ug/m3	N/A	May-04-13	
nC8-nC10 (aromatic)	< 4.4	4.4	ug/m3	N/A	N/A	
nC8-nC10 (non-aromatic)	**760**	220	ug/m3	N/A	N/A	
nC6-nC10 (total)	**890**	440	ug/m3	N/A	May-04-13	
nC10-nC12 (total)	**760**	220	ug/m3	N/A	May-04-13	
nC10-nC12 (aromatic)	< 4.4	4.4	ug/m3	N/A	N/A	
nC10-nC12 (non-aromatic)	**760**	220	ug/m3	N/A	N/A	
nC12-nC16 (total)	< 440	440	ug/m3	N/A	May-04-13	
nC12-nC16 (aromatic)	< 4.4	4.4	ug/m3	N/A	N/A	
nC12-nC16 (non-aromatic)	< 440	440	ug/m3	N/A	N/A	
nC10-nC16 (total)	**1100**	440	ug/m3	N/A	May-04-13	
VHv (6-13)	**1600**	890	ug/m3	N/A	May-04-13	
VPHv	**1600**	890	ug/m3	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 4.4	4.4	ug/m3	N/A	May-04-13	
Acrylonitrile	< 0.44	0.44	ug/m3	N/A	May-04-13	
Allyl chloride	< 0.44	0.44	ug/m3	N/A	May-04-13	
Benzene	< 0.89	0.89	ug/m3	N/A	May-04-13	
Bromobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
Bromodichloromethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
Bromoform	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,3-Butadiene	< 1.8	1.8	ug/m3	N/A	May-04-13	
2-Butanone (MEK)	< 2.2	2.2	ug/m3	N/A	May-04-13	
Carbon disulfide	< 4.4	4.4	ug/m3	N/A	May-04-13	
Carbon tetrachloride	< 0.44	0.44	ug/m3	N/A	May-04-13	
Chlorobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
Chloroethane	< 2.2	2.2	ug/m3	N/A	May-04-13	
Chloroform	< 0.44	0.44	ug/m3	N/A	May-04-13	
2-Chlorotoluene	< 0.89	0.89	ug/m3	N/A	May-04-13	
n-Decane	**1.7**	1.3	ug/m3	N/A	May-04-13	
1,2-Dibromo-3-chloropropane	< 0.44	0.44	ug/m3	N/A	May-04-13	
Dibromochloromethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,2-Dibromoethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
Dibromomethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,2-Dichlorobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,3-Dichlorobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,4-Dichlorobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
Dichlorodifluoromethane	< 0.89	0.89	ug/m3	N/A	May-04-13	
1,1-Dichloroethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,2-Dichloroethane	< 0.27	0.27	ug/m3	N/A	May-04-13	
1,1-Dichloroethene	< 0.44	0.44	ug/m3	N/A	May-04-13	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-16 Well B (3041469-03) [Air] Sampled: Apr-24-13 14:30 To Apr-24-13 14:45, Continued						
Sampling Flow: 150 mL/min	Sampling Time: 15 min					
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.44	0.44	ug/m3	N/A	May-04-13	
trans-1,2-Dichloroethene	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,2-Dichloropropane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,3-Dichloropropane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,3-Dichloropropene	< 0.89	0.89	ug/m3	N/A	May-04-13	
Ethyl acetate	< 2.2	2.2	ug/m3	N/A	May-04-13	
Ethylbenzene	**0.53**	0.44	ug/m3	N/A	May-04-13	
Ethyl ether	< 0.89	0.89	ug/m3	N/A	May-04-13	
Hexachlorobutadiene	< 0.44	0.44	ug/m3	N/A	May-04-13	
Ethyl methacrylate	< 0.44	0.44	ug/m3	N/A	May-04-13	
Hexachloroethane	< 1.8	1.8	ug/m3	N/A	May-04-13	
n-Hexane	< 4.4	4.4	ug/m3	N/A	May-04-13	
Isopropylbenzene (Cumene)	< 0.44	0.44	ug/m3	N/A	May-04-13	
Methacrylonitrile	< 0.44	0.44	ug/m3	N/A	May-04-13	
Methyl acrylate	< 2.2	2.2	ug/m3	N/A	May-04-13	
Methyl cyclohexane	< 0.89	0.89	ug/m3	N/A	May-04-13	
Methyl tert-butyl ether	< 0.89	0.89	ug/m3	N/A	May-04-13	
Methylene chloride	< 4.4	4.4	ug/m3	N/A	May-04-13	
Methyl methacrylate	< 0.89	0.89	ug/m3	N/A	May-04-13	
4-Methyl-2-Pentanone (MIBK)	< 0.89	0.89	ug/m3	N/A	May-04-13	
Naphthalene	< 0.44	0.44	ug/m3	N/A	May-04-13	
Nitrobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
Styrene	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,1,1,2-Tetrachloroethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,1,2,2-Tetrachloroethane	< 0.31	0.31	ug/m3	N/A	May-04-13	
Tetrachloroethene	< 2.2	2.2	ug/m3	N/A	May-04-13	
Tetrahydrofuran	< 0.44	0.44	ug/m3	N/A	May-04-13	
Toluene	< 4.4	4.4	ug/m3	N/A	May-04-13	
1,2,4-Trichlorobenzene	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,1,1-Trichloroethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.89	0.89	ug/m3	N/A	May-04-13	
1,1,2-Trichloroethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
Trichloroethene	< 0.22	0.22	ug/m3	N/A	May-04-13	
Trichlorofluoromethane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,2,3-Trichloropropane	< 0.44	0.44	ug/m3	N/A	May-04-13	
1,2,4-Trimethylbenzene	**1.3**	0.89	ug/m3	N/A	May-04-13	
1,3,5-Trimethylbenzene	< 0.89	0.89	ug/m3	N/A	May-04-13	
Vinyl chloride	< 0.89	0.89	ug/m3	N/A	May-04-13	
Xylenes (total)	**3.1**	2.2	ug/m3	N/A	May-04-13	
Surrogate: Toluene-d8	*86 %*	*60-130*		*N/A*	*May-04-13*	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-7B Deep Probe (3041469-04) [Air] Sampled: Apr-24-13 16:00 To Apr-24-13 16:15						
Sampling Flow: 200 mL/min	Sampling Time: 15 min					
Aggregate Organic Parameters						
nC6-nC8 (total)	**200**	170	ug/m3	N/A	May-04-13	
nC6-nC8 (aromatic)	**14**	3.3	ug/m3	N/A	N/A	
nC6-nC8 (non-aromatic)	**200**	170	ug/m3	N/A	N/A	
nC8-nC10 (total)	**630**	170	ug/m3	N/A	May-04-13	
nC8-nC10 (aromatic)	**3.3**	3.3	ug/m3	N/A	N/A	
nC8-nC10 (non-aromatic)	**630**	170	ug/m3	N/A	N/A	
nC6-nC10 (total)	**870**	330	ug/m3	N/A	May-04-13	
nC10-nC12 (total)	**670**	170	ug/m3	N/A	May-04-13	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3	N/A	N/A	
nC10-nC12 (non-aromatic)	**670**	170	ug/m3	N/A	N/A	
nC12-nC16 (total)	**500**	330	ug/m3	N/A	May-04-13	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3	N/A	N/A	
nC12-nC16 (non-aromatic)	**500**	330	ug/m3	N/A	N/A	
nC10-nC16 (total)	**1100**	330	ug/m3	N/A	May-04-13	
VHv (6-13)	**1500**	670	ug/m3	N/A	May-04-13	
VPHv	**1500**	670	ug/m3	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.3	3.3	ug/m3	N/A	May-04-13	
Acrylonitrile	< 0.33	0.33	ug/m3	N/A	May-04-13	
Allyl chloride	< 0.33	0.33	ug/m3	N/A	May-04-13	
Benzene	< 0.67	0.67	ug/m3	N/A	May-04-13	
Bromobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Bromodichloromethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Bromoform	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Butadiene	< 1.3	1.3	ug/m3	N/A	May-04-13	
2-Butanone (MEK)	< 1.7	1.7	ug/m3	N/A	May-04-13	
Carbon disulfide	< 3.3	3.3	ug/m3	N/A	May-04-13	
Carbon tetrachloride	**0.40**	0.33	ug/m3	N/A	May-04-13	
Chlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Chloroethane	< 1.7	1.7	ug/m3	N/A	May-04-13	
Chloroform	**3.3**	0.33	ug/m3	N/A	May-04-13	
2-Chlorotoluene	< 0.67	0.67	ug/m3	N/A	May-04-13	
n-Decane	**1.8**	1.0	ug/m3	N/A	May-04-13	
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Dibromochloromethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dibromoethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Dibromomethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Dichlorodifluoromethane	**4.3**	0.67	ug/m3	N/A	May-04-13	
1,1-Dichloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dichloroethane	< 0.20	0.20	ug/m3	N/A	May-04-13	
1,1-Dichloroethene	< 0.33	0.33	ug/m3	N/A	May-04-13	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-7B Deep Probe (3041469-04) [Air] Sampled: Apr-24-13 16:00 To Apr-24-13 16:15, Continued						
Sampling Flow: 200 mL/min	Sampling Time: 15 min					
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3	N/A	May-04-13	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dichloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Dichloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Dichloropropene	< 0.67	0.67	ug/m3	N/A	May-04-13	
Ethyl acetate	< 1.7	1.7	ug/m3	N/A	May-04-13	
Ethylbenzene	**0.43**	0.33	ug/m3	N/A	May-04-13	
Ethyl ether	< 0.67	0.67	ug/m3	N/A	May-04-13	
Hexachlorobutadiene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Ethyl methacrylate	< 0.33	0.33	ug/m3	N/A	May-04-13	
Hexachloroethane	< 1.3	1.3	ug/m3	N/A	May-04-13	
n-Hexane	< 3.3	3.3	ug/m3	N/A	May-04-13	
Isopropylbenzene (Cumene)	< 0.33	0.33	ug/m3	N/A	May-04-13	
Methacrylonitrile	< 0.33	0.33	ug/m3	N/A	May-04-13	
Methyl acrylate	< 1.7	1.7	ug/m3	N/A	May-04-13	
Methyl cyclohexane	< 0.67	0.67	ug/m3	N/A	May-04-13	
Methyl tert-butyl ether	< 0.67	0.67	ug/m3	N/A	May-04-13	
Methylene chloride	< 3.3	3.3	ug/m3	N/A	May-04-13	
Methyl methacrylate	< 0.67	0.67	ug/m3	N/A	May-04-13	
4-Methyl-2-Pentanone (MIBK)	< 0.67	0.67	ug/m3	N/A	May-04-13	
Naphthalene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Nitrobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Styrene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,1,1,2-Tetrachloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,1,2,2-Tetrachloroethane	< 0.23	0.23	ug/m3	N/A	May-04-13	
Tetrachloroethene	< 1.7	1.7	ug/m3	N/A	May-04-13	
Tetrahydrofuran	< 0.33	0.33	ug/m3	N/A	May-04-13	
Toluene	**14**	3.3	ug/m3	N/A	May-04-13	
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.67	0.67	ug/m3	N/A	May-04-13	
1,1,2-Trichloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Trichloroethene	< 0.17	0.17	ug/m3	N/A	May-04-13	
Trichlorofluoromethane	**1.0**	0.33	ug/m3	N/A	May-04-13	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2,4-Trimethylbenzene	**1.2**	0.67	ug/m3	N/A	May-04-13	
1,3,5-Trimethylbenzene	< 0.67	0.67	ug/m3	N/A	May-04-13	
Vinyl chloride	< 0.67	0.67	ug/m3	N/A	May-04-13	
Xylenes (total)	**2.6**	1.7	ug/m3	N/A	May-04-13	
Surrogate: Toluene-d8	*87 %*	*60-130*		*N/A*	*May-04-13*	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-6 Well A (3041469-05) [Air] Sampled: Apr-25-13 09:30 To Apr-25-13 09:45						
Sampling Flow: 201 mL/min	Sampling Time: 15 min					
Aggregate Organic Parameters						
nC6-nC8 (total)	< 17000	17000	ug/m3	May-04-13	May-05-13	
nC6-nC8 (aromatic)	**110**	3.3	ug/m3	N/A	N/A	
nC6-nC8 (non-aromatic)	< 17000	17000	ug/m3	N/A	N/A	
nC8-nC10 (total)	**170000**	17000	ug/m3	May-04-13	May-05-13	
nC8-nC10 (aromatic)	**76000**	330	ug/m3	N/A	N/A	
nC8-nC10 (non-aromatic)	**93000**	17000	ug/m3	N/A	N/A	
nC6-nC10 (total)	**180000**	33000	ug/m3	May-04-13	May-05-13	
nC10-nC12 (total)	**160000**	17000	ug/m3	May-04-13	May-05-13	
nC10-nC12 (aromatic)	**43000**	330	ug/m3	N/A	N/A	
nC10-nC12 (non-aromatic)	**120000**	17000	ug/m3	N/A	N/A	
nC12-nC16 (total)	**150000**	33000	ug/m3	May-04-13	May-05-13	
nC12-nC16 (aromatic)	**1200**	330	ug/m3	N/A	N/A	
nC12-nC16 (non-aromatic)	**150000**	33000	ug/m3	N/A	N/A	
nC10-nC16 (total)	**310000**	33000	ug/m3	May-04-13	May-05-13	
VHv (6-13)	**360000**	6600	ug/m3	N/A	May-04-13	
VPHv	**330000**	6600	ug/m3	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	**4.3**	3.3	ug/m3	N/A	May-04-13	
Acrylonitrile	< 0.33	0.33	ug/m3	N/A	May-04-13	
Allyl chloride	< 0.33	0.33	ug/m3	N/A	May-04-13	
Benzene	**1.2**	0.66	ug/m3	N/A	May-04-13	
Bromobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Bromodichloromethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Bromoform	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Butadiene	< 1.3	1.3	ug/m3	N/A	May-04-13	
2-Butanone (MEK)	< 1.7	1.7	ug/m3	N/A	May-04-13	
Carbon disulfide	< 3.3	3.3	ug/m3	N/A	May-04-13	
Carbon tetrachloride	< 0.33	0.33	ug/m3	N/A	May-04-13	
Chlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Chloroethane	< 1.7	1.7	ug/m3	N/A	May-04-13	
Chloroform	**150**	3.3	ug/m3	May-04-13	May-05-13	
2-Chlorotoluene	< 0.66	0.66	ug/m3	N/A	May-04-13	
n-Decane	**3600**	100	ug/m3	May-04-13	May-05-13	
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Dibromochloromethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dibromoethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Dibromomethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Dichlorodifluoromethane	**5.0**	0.66	ug/m3	N/A	May-04-13	
1,1-Dichloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dichloroethane	< 0.20	0.20	ug/m3	N/A	May-04-13	
1,1-Dichloroethene	< 0.33	0.33	ug/m3	N/A	May-04-13	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-6 Well A (3041469-05) [Air] Sampled: Apr-25-13 09:30 To Apr-25-13 09:45, Continued						
Sampling Flow: 201 mL/min	Sampling Time: 15 min					
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	**2.8**	0.33	ug/m3	N/A	May-04-13	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dichloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Dichloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Dichloropropene	< 0.66	0.66	ug/m3	N/A	May-04-13	
Ethyl acetate	< 1.7	1.7	ug/m3	N/A	May-04-13	
Ethylbenzene	**8600**	33	ug/m3	May-04-13	May-05-13	
Ethyl ether	< 0.66	0.66	ug/m3	N/A	May-04-13	
Hexachlorobutadiene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Ethyl methacrylate	< 0.33	0.33	ug/m3	N/A	May-04-13	
Hexachloroethane	< 1.3	1.3	ug/m3	N/A	May-04-13	
n-Hexane	**17**	3.3	ug/m3	N/A	May-04-13	
Isopropylbenzene (Cumene)	**90**	0.33	ug/m3	N/A	May-04-13	
Methacrylonitrile	< 0.33	0.33	ug/m3	N/A	May-04-13	
Methyl acrylate	< 1.7	1.7	ug/m3	N/A	May-04-13	
Methyl cyclohexane	**160**	6.6	ug/m3	May-04-13	May-05-13	
Methyl tert-butyl ether	< 0.66	0.66	ug/m3	N/A	May-04-13	
Methylene chloride	< 3.3	3.3	ug/m3	N/A	May-04-13	
Methyl methacrylate	< 0.66	0.66	ug/m3	N/A	May-04-13	
4-Methyl-2-Pentanone (MIBK)	< 0.66	0.66	ug/m3	N/A	May-04-13	
Naphthalene	**32000**	33	ug/m3	N/A	May-04-13	RA4
Nitrobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Styrene	**25**	0.33	ug/m3	N/A	May-04-13	
1,1,1,2-Tetrachloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,1,2,2-Tetrachloroethane	< 0.23	0.23	ug/m3	N/A	May-04-13	
Tetrachloroethene	**43**	1.7	ug/m3	N/A	May-04-13	
Tetrahydrofuran	< 0.33	0.33	ug/m3	N/A	May-04-13	
Toluene	**100**	3.3	ug/m3	N/A	May-04-13	
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.66	0.66	ug/m3	N/A	May-04-13	
1,1,2-Trichloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Trichloroethene	**3.7**	0.17	ug/m3	N/A	May-04-13	
Trichlorofluoromethane	**0.73**	0.33	ug/m3	N/A	May-04-13	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2,4-Trimethylbenzene	**12000**	66	ug/m3	May-04-13	May-05-13	RA4
1,3,5-Trimethylbenzene	**7300**	66	ug/m3	May-04-13	May-05-13	
Vinyl chloride	< 0.66	0.66	ug/m3	N/A	May-04-13	
Xylenes (total)	**33000**	170	ug/m3	May-04-13	May-05-13	RA4
Surrogate: Toluene-d8	*89 %*	*60-130*		*N/A*	*May-04-13*	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-15 Well (3041469-07) [Air] Sampled: Apr-25-13 13:00 To Apr-25-13 13:15						
Sampling Flow: 205 mL/min	Sampling Time: 15 min					
Aggregate Organic Parameters						
nC6-nC8 (total)	< 160	160	ug/m3	N/A	May-04-13	
nC6-nC8 (aromatic)	**4.9**	3.3	ug/m3	N/A	N/A	
nC6-nC8 (non-aromatic)	< 160	160	ug/m3	N/A	N/A	
nC8-nC10 (total)	**880**	160	ug/m3	N/A	May-04-13	
nC8-nC10 (aromatic)	**23**	3.3	ug/m3	N/A	N/A	
nC8-nC10 (non-aromatic)	**850**	160	ug/m3	N/A	N/A	
nC6-nC10 (total)	**980**	330	ug/m3	N/A	May-04-13	
nC10-nC12 (total)	**1200**	160	ug/m3	N/A	May-04-13	
nC10-nC12 (aromatic)	< 3.3	3.3	ug/m3	N/A	N/A	
nC10-nC12 (non-aromatic)	**1200**	160	ug/m3	N/A	N/A	
nC12-nC16 (total)	**750**	330	ug/m3	N/A	May-04-13	
nC12-nC16 (aromatic)	< 3.3	3.3	ug/m3	N/A	N/A	
nC12-nC16 (non-aromatic)	**750**	330	ug/m3	N/A	N/A	
nC10-nC16 (total)	**2000**	330	ug/m3	N/A	May-04-13	
VHv (6-13)	**2200**	650	ug/m3	N/A	May-04-13	
VPHv	**2200**	650	ug/m3	N/A	N/A	
Volatile Organic Compounds (VOC)						
Acetone	< 3.3	3.3	ug/m3	N/A	May-04-13	
Acrylonitrile	< 0.33	0.33	ug/m3	N/A	May-04-13	
Allyl chloride	< 0.33	0.33	ug/m3	N/A	May-04-13	
Benzene	< 0.65	0.65	ug/m3	N/A	May-04-13	
Bromobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Bromodichloromethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Bromoform	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Butadiene	< 1.3	1.3	ug/m3	N/A	May-04-13	
2-Butanone (MEK)	< 1.6	1.6	ug/m3	N/A	May-04-13	
Carbon disulfide	< 3.3	3.3	ug/m3	N/A	May-04-13	
Carbon tetrachloride	< 0.33	0.33	ug/m3	N/A	May-04-13	
Chlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Chloroethane	< 1.6	1.6	ug/m3	N/A	May-04-13	
Chloroform	**11**	0.33	ug/m3	N/A	May-04-13	
2-Chlorotoluene	< 0.65	0.65	ug/m3	N/A	May-04-13	
n-Decane	**4.6**	0.98	ug/m3	N/A	May-04-13	
1,2-Dibromo-3-chloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Dibromochloromethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dibromoethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Dibromomethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Dichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,4-Dichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Dichlorodifluoromethane	**4.2**	0.65	ug/m3	N/A	May-04-13	
1,1-Dichloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dichloroethane	< 0.20	0.20	ug/m3	N/A	May-04-13	
1,1-Dichloroethene	< 0.33	0.33	ug/m3	N/A	May-04-13	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result / *Recovery*	MRL / *Limit*	Units	Prepared	Analyzed	Notes
Sample ID: MW10-15 Well (3041469-07) [Air] Sampled: Apr-25-13 13:00 To Apr-25-13 13:15, Continued						
Sampling Flow: 205 mL/min	Sampling Time: 15 min					
Volatile Organic Compounds (VOC), Continued						
cis-1,2-Dichloroethene	< 0.33	0.33	ug/m3	N/A	May-04-13	
trans-1,2-Dichloroethene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2-Dichloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Dichloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,3-Dichloropropene	< 0.65	0.65	ug/m3	N/A	May-04-13	
Ethyl acetate	< 1.6	1.6	ug/m3	N/A	May-04-13	
Ethylbenzene	**1.4**	0.33	ug/m3	N/A	May-04-13	
Ethyl ether	< 0.65	0.65	ug/m3	N/A	May-04-13	
Hexachlorobutadiene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Ethyl methacrylate	< 0.33	0.33	ug/m3	N/A	May-04-13	
Hexachloroethane	< 1.3	1.3	ug/m3	N/A	May-04-13	
n-Hexane	< 3.3	3.3	ug/m3	N/A	May-04-13	
Isopropylbenzene (Cumene)	< 0.33	0.33	ug/m3	N/A	May-04-13	
Methacrylonitrile	< 0.33	0.33	ug/m3	N/A	May-04-13	
Methyl acrylate	< 1.6	1.6	ug/m3	N/A	May-04-13	
Methyl cyclohexane	< 0.65	0.65	ug/m3	N/A	May-04-13	
Methyl tert-butyl ether	< 0.65	0.65	ug/m3	N/A	May-04-13	
Methylene chloride	< 3.3	3.3	ug/m3	N/A	May-04-13	
Methyl methacrylate	< 0.65	0.65	ug/m3	N/A	May-04-13	
4-Methyl-2-Pentanone (MIBK)	< 0.65	0.65	ug/m3	N/A	May-04-13	
Naphthalene	**2.7**	0.33	ug/m3	N/A	May-04-13	
Nitrobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
Styrene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,1,1,2-Tetrachloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,1,2,2-Tetrachloroethane	< 0.23	0.23	ug/m3	N/A	May-04-13	
Tetrachloroethene	< 1.6	1.6	ug/m3	N/A	May-04-13	
Tetrahydrofuran	**0.36**	0.33	ug/m3	N/A	May-04-13	
Toluene	**4.9**	3.3	ug/m3	N/A	May-04-13	
1,2,4-Trichlorobenzene	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,1,1-Trichloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,1,2-Trichloro-1,2,2-trifluoroethane	**0.72**	0.65	ug/m3	N/A	May-04-13	
1,1,2-Trichloroethane	< 0.33	0.33	ug/m3	N/A	May-04-13	
Trichloroethene	< 0.16	0.16	ug/m3	N/A	May-04-13	
Trichlorofluoromethane	**0.94**	0.33	ug/m3	N/A	May-04-13	
1,2,3-Trichloropropane	< 0.33	0.33	ug/m3	N/A	May-04-13	
1,2,4-Trimethylbenzene	**9.1**	0.65	ug/m3	N/A	May-04-13	
1,3,5-Trimethylbenzene	**2.1**	0.65	ug/m3	N/A	May-04-13	
Vinyl chloride	< 0.65	0.65	ug/m3	N/A	May-04-13	
Xylenes (total)	**10**	1.6	ug/m3	N/A	May-04-13	
Surrogate: Toluene-d8	*86 %*	*60-130*		*N/A*	*May-04-13*	

Sample / Analysis Qualifiers:

RA4 This in an estimated value. The result was over the calibration range, and further dilution was not possible.

REPORTED TO	Golder Associates Ltd. (Calgary)	**WORK ORDER**	3041469
PROJECT	11-1324-0164	**REPORTED**	May-13-13

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: Laboratory reagent water is carried through sample preparation and analysis steps. Method Blanks indicate that results are free from contamination, i.e. not biased high from sources such as the sample container or the laboratory environment
- **Duplicate (Dup)**: Preparation and analysis of a replicate aliquot of a sample. Duplicates provide a measure of the analytical method's precision, i.e. how reproducible a result is. Duplicates are only reported if they are associated with your sample data.
- **Blank Spike (BS)**: A known amount of standard is carried through sample preparation and analysis steps. Blank Spikes, also known as laboratory control samples (LCS), are prepared from a different source of standard than used for the calibration. They ensure that the calibration is acceptable (i.e. not biased high or low) and also provide a measure of the analytical method's accuracy (i.e. closeness of the result to a target value).
- **Standard Reference Material (SRM)**: A material of similar matrix to the samples, externally certified for the parameter(s) listed. Standard Reference Materials ensure that the preparation steps in the method are adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Aggregate Organic Parameters, Batch B3D1097										
Blank (B3D1097-BLK1)				Prepared: May-04-13, Analyzed: May-04-13						
nC6-nC8 (total)	< 0.5	0.5	ug							
nC8-nC10 (total)	< 0.5	0.5	ug							
nC6-nC10 (total)	< 1.0	1.0	ug							
nC10-nC12 (total)	< 0.5	0.5	ug							
nC12-nC16 (total)	< 1.0	1.0	ug							
nC10-nC16 (total)	< 1.0	1.0	ug							
VHv (6-13)	< 2.0	2.0	ug							
LCS (B3D1097-BS2)				Prepared: May-04-13, Analyzed: May-04-13						
VHv (6-13)	8.1	2.0	ug	10.0		81	86-122			SPK
Duplicate (B3D1097-DUP1)		**Source: 3041469-01**		Prepared: May-04-13, Analyzed: May-04-13						
nC6-nC8 (total)	< 168	170	ug/m3 Air		< 168				30	
nC8-nC10 (total)	510	170	ug/m3 Air		440				30	
nC6-nC10 (total)	610	340	ug/m3 Air		540				30	
nC10-nC12 (total)	470	170	ug/m3 Air		400				30	
nC12-nC16 (total)	340	340	ug/m3 Air		< 337				30	
nC10-nC16 (total)	840	340	ug/m3 Air		610				30	
VHv (6-13)	1,200	670	ug/m3 Air		910				30	
Volatile Organic Compounds (VOC), Batch B3D1097										
Blank (B3D1097-BLK1)				Prepared: May-04-13, Analyzed: May-04-13						
Acetone	< 0.010	0.010	ug							
Acrylonitrile	< 0.0010	0.0010	ug							
Allyl chloride	< 0.0010	0.0010	ug							
Benzene	< 0.0020	0.0020	ug							
Bromobenzene	< 0.0010	0.0010	ug							
Bromodichloromethane	< 0.0010	0.0010	ug							
Bromoform	< 0.0010	0.0010	ug							
1,3-Butadiene	< 0.0040	0.0040	ug							
2-Butanone (MEK)	< 0.0050	0.0050	ug							
Carbon disulfide	< 0.010	0.010	ug							
Carbon tetrachloride	< 0.0010	0.0010	ug							

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes

Volatile Organic Compounds (VOC), Batch B3D1097, Continued

Blank (B3D1097-BLK1), Continued				Prepared: May-04-13, Analyzed: May-04-13						
Chlorobenzene	< 0.0010	0.0010	ug							
Chloroethane	< 0.0050	0.0050	ug							
Chloroform	< 0.0010	0.0010	ug							
2-Chlorotoluene	< 0.0020	0.0020	ug							
n-Decane	< 0.0030	0.0030	ug							
1,2-Dibromo-3-chloropropane	< 0.0010	0.0010	ug							
Dibromochloromethane	< 0.0010	0.0010	ug							
1,2-Dibromoethane	< 0.0010	0.0010	ug							
Dibromomethane	< 0.0010	0.0010	ug							
1,2-Dichlorobenzene	< 0.0010	0.0010	ug							
1,3-Dichlorobenzene	< 0.0010	0.0010	ug							
1,4-Dichlorobenzene	< 0.0010	0.0010	ug							
Dichlorodifluoromethane	< 0.0020	0.0020	ug							
1,1-Dichloroethane	< 0.0010	0.0010	ug							
1,2-Dichloroethane	< 0.0006	0.0006	ug							
1,1-Dichloroethene	< 0.0010	0.0010	ug							
cis-1,2-Dichloroethene	< 0.0010	0.0010	ug							
trans-1,2-Dichloroethene	< 0.0010	0.0010	ug							
1,2-Dichloropropane	< 0.0010	0.0010	ug							
1,3-Dichloropropane	< 0.0010	0.0010	ug							
1,3-Dichloropropene	< 0.0020	0.0020	ug							
Ethyl acetate	< 0.0050	0.0050	ug							
Ethylbenzene	< 0.0010	0.0010	ug							
Ethyl ether	< 0.0020	0.0020	ug							
Hexachlorobutadiene	< 0.0010	0.0010	ug							
Ethyl methacrylate	< 0.0010	0.0010	ug							
Hexachloroethane	< 0.0040	0.0040	ug							
n-Hexane	< 0.010	0.010	ug							
Isopropylbenzene (Cumene)	< 0.0010	0.0010	ug							
Methacrylonitrile	< 0.0010	0.0010	ug							
Methyl acrylate	< 0.0050	0.0050	ug							
Methyl cyclohexane	< 0.0020	0.0020	ug							
Methyl tert-butyl ether	< 0.0020	0.0020	ug							
Methylene chloride	< 0.010	0.010	ug							
Methyl methacrylate	< 0.0020	0.0020	ug							
4-Methyl-2-Pentanone (MIBK)	< 0.0020	0.0020	ug							
Naphthalene	< 0.0010	0.0010	ug							
Nitrobenzene	< 0.0010	0.0010	ug							
Styrene	< 0.0010	0.0010	ug							
1,1,1,2-Tetrachloroethane	< 0.0010	0.0010	ug							
1,1,2,2-Tetrachloroethane	< 0.0007	0.0007	ug							
Tetrachloroethene	< 0.0050	0.0050	ug							
Tetrahydrofuran	< 0.0010	0.0010	ug							
Toluene	< 0.010	0.010	ug							
1,2,4-Trichlorobenzene	< 0.0010	0.0010	ug							
1,1,1-Trichloroethane	< 0.0010	0.0010	ug							
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.0020	0.0020	ug							
1,1,2-Trichloroethane	< 0.0010	0.0010	ug							
Trichloroethene	< 0.0005	0.0005	ug							
Trichlorofluoromethane	< 0.0010	0.0010	ug							
1,2,3-Trichloropropane	< 0.0010	0.0010	ug							
1,2,4-Trimethylbenzene	< 0.0020	0.0020	ug							
1,3,5-Trimethylbenzene	< 0.0020	0.0020	ug							
Vinyl chloride	< 0.0020	0.0020	ug							
Xylenes (total)	< 0.0050	0.0050	ug							

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Volatile Organic Compounds (VOC), Batch B3D1097, Continued										
LCS (B3D1097-BS1)				Prepared: May-03-13, Analyzed: May-04-13						
Acetone	0.0633	0.010	ug	0.0500		127	60-140			
Acrylonitrile	0.0549	0.0010	ug	0.0500		110	60-140			
Allyl chloride	0.0524	0.0010	ug	0.0500		105	60-140			
Benzene	0.0548	0.0020	ug	0.0500		110	60-140			
Bromobenzene	0.0498	0.0010	ug	0.0500		100	60-140			
Bromodichloromethane	0.0493	0.0010	ug	0.0500		99	60-140			
Bromoform	0.0408	0.0010	ug	0.0500		82	60-140			
1,3-Butadiene	0.0230	0.0040	ug	0.0375		61	60-140			
2-Butanone (MEK)	0.0527	0.0050	ug	0.0500		105	60-140			
Carbon disulfide	0.0470	0.010	ug	0.0500		94	60-140			
Carbon tetrachloride	0.0230	0.0010	ug	0.0500		46	60-140			SPK
Chlorobenzene	0.0519	0.0010	ug	0.0500		104	60-140			
Chloroethane	0.0481	0.0050	ug	0.0500		96	60-140			
Chloroform	0.0543	0.0010	ug	0.0500		109	60-140			
2-Chlorotoluene	0.0507	0.0020	ug	0.0500		101	60-140			
n-Decane	0.0614	0.0030	ug	0.0500		123	60-140			
1,2-Dibromo-3-chloropropane	0.0452	0.0010	ug	0.0500		90	60-140			
Dibromochloromethane	0.0454	0.0010	ug	0.0500		91	60-140			
1,2-Dibromoethane	0.0574	0.0010	ug	0.0500		115	60-140			
Dibromomethane	0.0476	0.0010	ug	0.0500		95	60-140			
1,2-Dichlorobenzene	0.0495	0.0010	ug	0.0500		99	60-140			
1,3-Dichlorobenzene	0.0498	0.0010	ug	0.0500		100	60-140			
1,4-Dichlorobenzene	0.0493	0.0010	ug	0.0500		99	60-140			
Dichlorodifluoromethane	0.0244	0.0020	ug	0.0500		49	60-140			SPK
1,1-Dichloroethane	0.0559	0.0010	ug	0.0500		112	60-140			
1,2-Dichloroethane	0.0552	0.0006	ug	0.0500		110	60-140			
1,1-Dichloroethene	0.0518	0.0010	ug	0.0500		104	60-140			
cis-1,2-Dichloroethene	0.0540	0.0010	ug	0.0500		108	60-140			
trans-1,2-Dichloroethene	0.0518	0.0010	ug	0.0500		104	60-140			
1,2-Dichloropropane	0.0544	0.0010	ug	0.0500		109	60-140			
1,3-Dichloropropane	0.0562	0.0010	ug	0.0500		112	60-140			
1,3-Dichloropropene	0.106	0.0020	ug	0.100		106	60-140			
Ethyl acetate	0.0547	0.0050	ug	0.0500		109	60-140			
Ethylbenzene	0.0500	0.0010	ug	0.0500		100	60-140			
Ethyl ether	0.0560	0.0020	ug	0.0500		112	60-140			
Hexachlorobutadiene	0.0448	0.0010	ug	0.0500		90	60-140			
Ethyl methacrylate	0.0520	0.0010	ug	0.0500		104	60-140			
Hexachloroethane	0.0235	0.0040	ug	0.0500		47	60-140			SPK
n-Hexane	0.0505	0.010	ug	0.0500		101	60-140			
Isopropylbenzene (Cumene)	0.0516	0.0010	ug	0.0500		103	60-140			
Methacrylonitrile	0.0540	0.0010	ug	0.0500		108	60-140			
Methyl acrylate	0.0542	0.0050	ug	0.0500		108	60-140			
Methyl cyclohexane	0.0534	0.0020	ug	0.0500		107	60-140			
Methyl tert-butyl ether	0.0585	0.0020	ug	0.0500		117	60-140			
Methylene chloride	0.0533	0.010	ug	0.0500		107	60-140			
Methyl methacrylate	0.0497	0.0020	ug	0.0500		99	60-140			
4-Methyl-2-Pentanone (MIBK)	0.0538	0.0020	ug	0.0500		108	60-140			
Naphthalene	0.0489	0.0010	ug	0.0500		98	60-140			
Nitrobenzene	0.0551	0.0010	ug	0.0500		110	60-140			
Styrene	0.0500	0.0010	ug	0.0500		100	60-140			
1,1,1,2-Tetrachloroethane	0.0461	0.0010	ug	0.0500		92	60-140			
1,1,2,2-Tetrachloroethane	0.0542	0.0007	ug	0.0500		108	60-140			
Tetrachloroethene	0.0646	0.0050	ug	0.0500		129	60-140			
Tetrahydrofuran	0.0556	0.0010	ug	0.0500		111	60-140			
Toluene	0.0526	0.010	ug	0.0500		105	60-140			
1,2,4-Trichlorobenzene	0.0471	0.0010	ug	0.0500		94	60-140			

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Volatile Organic Compounds (VOC), Batch B3D1097, Continued										
LCS (B3D1097-BS1), Continued				Prepared: May-03-13, Analyzed: May-04-13						
1,1,1-Trichloroethane	0.0507	0.0010	ug	0.0500		101	60-140			
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0441	0.0020	ug	0.0500		88	60-140			
1,1,2-Trichloroethane	0.0544	0.0010	ug	0.0500		109	60-140			
Trichloroethene	0.0595	0.0005	ug	0.0500		119	60-140			
Trichlorofluoromethane	0.0465	0.0010	ug	0.0500		93	60-140			
1,2,3-Trichloropropane	0.0518	0.0010	ug	0.0500		104	60-140			
1,2,4-Trimethylbenzene	0.0529	0.0020	ug	0.0500		106	60-140			
1,3,5-Trimethylbenzene	0.0509	0.0020	ug	0.0500		102	60-140			
Vinyl chloride	0.0338	0.0020	ug	0.0500		68	60-140			
Xylenes (total)	0.159	0.0050	ug	0.150		106	60-140			
LCS Dup (B3D1097-BSD1)				Prepared: May-03-13, Analyzed: May-04-13						
Acetone	0.0674	0.010	ug	0.0500		135	60-140	6	40	
Acrylonitrile	0.0518	0.0010	ug	0.0500		104	60-140	6	30	
Allyl chloride	0.0411	0.0010	ug	0.0500		82	60-140	24	30	
Benzene	0.0564	0.0020	ug	0.0500		113	60-140	3	30	
Bromobenzene	0.0470	0.0010	ug	0.0500		94	60-140	6	30	
Bromodichloromethane	0.0308	0.0010	ug	0.0500		62	60-140	46	30	RPD
Bromoform	0.0260	0.0010	ug	0.0500		52	60-140	44	30	RPD, SPK
1,3-Butadiene	0.0309	0.0040	ug	0.0375		82	60-140	29	30	
2-Butanone (MEK)	0.0456	0.0050	ug	0.0500		91	60-140	14	30	
Carbon disulfide	0.0413	0.010	ug	0.0500		83	60-140	13	30	
Carbon tetrachloride	0.0012	0.0010	ug	0.0500		2	60-140	180	30	RPD, SPK
Chlorobenzene	0.0503	0.0010	ug	0.0500		101	60-140	3	30	
Chloroethane	0.0491	0.0050	ug	0.0500		98	60-140	2	30	
Chloroform	0.0505	0.0010	ug	0.0500		101	60-140	7	30	
2-Chlorotoluene	0.0481	0.0020	ug	0.0500		96	60-140	5	30	
n-Decane	0.0632	0.0030	ug	0.0500		126	60-140	3	30	
1,2-Dibromo-3-chloropropane	0.0372	0.0010	ug	0.0500		74	60-140	19	30	
Dibromochloromethane	0.0265	0.0010	ug	0.0500		53	60-140	53	30	RPD, SPK
1,2-Dibromoethane	0.0512	0.0010	ug	0.0500		102	60-140	11	30	
Dibromomethane	0.0413	0.0010	ug	0.0500		83	60-140	14	30	
1,2-Dichlorobenzene	0.0478	0.0010	ug	0.0500		96	60-140	3	30	
1,3-Dichlorobenzene	0.0476	0.0010	ug	0.0500		95	60-140	4	30	
1,4-Dichlorobenzene	0.0477	0.0010	ug	0.0500		95	60-140	3	30	
Dichlorodifluoromethane	0.0272	0.0020	ug	0.0500		54	60-140	11	30	SPK
1,1-Dichloroethane	0.0537	0.0010	ug	0.0500		107	60-140	4	30	
1,2-Dichloroethane	0.0512	0.0006	ug	0.0500		102	60-140	8	30	
1,1-Dichloroethene	0.0593	0.0010	ug	0.0500		119	60-140	14	30	
cis-1,2-Dichloroethene	0.0512	0.0010	ug	0.0500		102	60-140	5	30	
trans-1,2-Dichloroethene	0.0485	0.0010	ug	0.0500		97	60-140	7	30	
1,2-Dichloropropane	0.0513	0.0010	ug	0.0500		103	60-140	6	30	
1,3-Dichloropropane	0.0527	0.0010	ug	0.0500		105	60-140	6	30	
1,3-Dichloropropene	0.0797	0.0020	ug	0.100		80	60-140	28	30	
Ethyl acetate	0.0430	0.0050	ug	0.0500		86	60-140	24	30	
Ethylbenzene	0.0490	0.0010	ug	0.0500		98	60-140	2	30	
Ethyl ether	0.0513	0.0020	ug	0.0500		103	60-140	9	30	
Hexachlorobutadiene	0.0420	0.0010	ug	0.0500		84	60-140	6	30	
Ethyl methacrylate	0.0452	0.0010	ug	0.0500		90	60-140	14	30	
Hexachloroethane	< 0.0040	0.0040	ug	0.0500		4	60-140	171	30	RPD, SPK
n-Hexane	0.0497	0.010	ug	0.0500		99	60-140	1	30	
Isopropylbenzene (Cumene)	0.0504	0.0010	ug	0.0500		101	60-140	2	30	
Methacrylonitrile	0.0469	0.0010	ug	0.0500		94	60-140	14	30	
Methyl acrylate	0.0472	0.0050	ug	0.0500		94	60-140	14	30	
Methyl cyclohexane	0.0525	0.0020	ug	0.0500		105	60-140	2	30	
Methyl tert-butyl ether	0.0534	0.0020	ug	0.0500		107	60-140	9	30	
Methylene chloride	0.0556	0.010	ug	0.0500		111	60-140	4	30	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Volatile Organic Compounds (VOC), Batch B3D1097, Continued										
LCS Dup (B3D1097-BSD1), Continued				Prepared: May-03-13, Analyzed: May-04-13						
Methyl methacrylate	0.0445	0.0020	ug	0.0500		89	60-140	11	30	
4-Methyl-2-Pentanone (MIBK)	0.0491	0.0020	ug	0.0500		98	60-140	9	30	
Naphthalene	0.0547	0.0010	ug	0.0500		109	60-140	11	30	
Nitrobenzene	0.0466	0.0010	ug	0.0500		93	60-140	17	30	
Styrene	0.0440	0.0010	ug	0.0500		88	60-140	13	30	
1,1,1,2-Tetrachloroethane	0.0298	0.0010	ug	0.0500		60	60-140	43	30	RPD, SPK
1,1,2,2-Tetrachloroethane	0.0502	0.0007	ug	0.0500		100	60-140	8	30	
Tetrachloroethene	0.0778	0.0050	ug	0.0500		156	60-140	18	30	SPK
Tetrahydrofuran	0.0496	0.0010	ug	0.0500		99	60-140	11	30	
Toluene	0.0524	0.010	ug	0.0500		105	60-140	< 1	30	
1,2,4-Trichlorobenzene	0.0484	0.0010	ug	0.0500		97	60-140	3	30	
1,1,1-Trichloroethane	0.0442	0.0010	ug	0.0500		88	60-140	14	30	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0402	0.0020	ug	0.0500		80	60-140	9	30	
1,1,2-Trichloroethane	0.0513	0.0010	ug	0.0500		103	60-140	6	30	
Trichloroethene	0.0706	0.0005	ug	0.0500		141	60-140	17	30	SPK
Trichlorofluoromethane	0.0460	0.0010	ug	0.0500		92	60-140	1	30	
1,2,3-Trichloropropane	0.0496	0.0010	ug	0.0500		99	60-140	4	30	
1,2,4-Trimethylbenzene	0.0544	0.0020	ug	0.0500		109	60-140	3	30	
1,3,5-Trimethylbenzene	0.0518	0.0020	ug	0.0500		104	60-140	2	30	
Vinyl chloride	0.0289	0.0020	ug	0.0500		58	60-140	15	40	SPK
Xylenes (total)	0.154	0.0050	ug	0.150		103	60-140	3	30	
Duplicate (B3D1097-DUP1)	**Source: 3041469-01**			Prepared: May-04-13, Analyzed: May-04-13						
Acetone	< 3.4	3.4	ug/m3 Air		< 3.4				40	
Acrylonitrile	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Allyl chloride	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Benzene	1.3	0.67	ug/m3 Air		< 0.67				40	
Bromobenzene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Bromodichloromethane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Bromoform	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,3-Butadiene	< 1.3	1.3	ug/m3 Air		< 1.3				40	
2-Butanone (MEK)	< 1.7	1.7	ug/m3 Air		< 1.7				40	
Carbon disulfide	< 3.4	3.4	ug/m3 Air		< 3.4				40	
Carbon tetrachloride	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Chlorobenzene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Chloroethane	< 1.7	1.7	ug/m3 Air		< 1.7				40	
Chloroform	8.1	0.34	ug/m3 Air		8.4			4	40	
2-Chlorotoluene	< 0.67	0.67	ug/m3 Air		< 0.67				40	
n-Decane	< 1.0	1.0	ug/m3 Air		< 1.0				40	
1,2-Dibromo-3-chloropropane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Dibromochloromethane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,2-Dibromoethane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Dibromomethane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,2-Dichlorobenzene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,3-Dichlorobenzene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,4-Dichlorobenzene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Dichlorodifluoromethane	4.7	0.67	ug/m3 Air		4.7			3	40	
1,1-Dichloroethane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,2-Dichloroethane	< 0.20	0.20	ug/m3 Air		< 0.20				40	
1,1-Dichloroethene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
cis-1,2-Dichloroethene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
trans-1,2-Dichloroethene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,2-Dichloropropane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,3-Dichloropropane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,3-Dichloropropene	< 0.67	0.67	ug/m3 Air		< 0.67				40	
Ethyl acetate	< 1.7	1.7	ug/m3 Air		< 1.7				40	
Ethylbenzene	1.3	0.34	ug/m3 Air		1.0				40	

REPORTED TO Golder Associates Ltd. (Calgary)
PROJECT 11-1324-0164

WORK ORDER 3041469
REPORTED May-13-13

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	RPD	RPD Limit	Notes
Volatile Organic Compounds (VOC), Batch B3D1097, Continued										
Duplicate (B3D1097-DUP1), Continued		**Source: 3041469-01**		Prepared: May-04-13, Analyzed: May-04-13						
Ethyl ether	< 0.67	0.67	ug/m3 Air		< 0.67				40	
Hexachlorobutadiene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Ethyl methacrylate	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Hexachloroethane	< 1.3	1.3	ug/m3 Air		< 1.3				40	
n-Hexane	< 3.4	3.4	ug/m3 Air		< 3.4				40	
Isopropylbenzene (Cumene)	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Methacrylonitrile	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Methyl acrylate	< 1.7	1.7	ug/m3 Air		< 1.7				40	
Methyl cyclohexane	< 0.67	0.67	ug/m3 Air		< 0.67				40	
Methyl tert-butyl ether	< 0.67	0.67	ug/m3 Air		< 0.67				40	
Methylene chloride	< 3.4	3.4	ug/m3 Air		< 3.4				40	
Methyl methacrylate	< 0.67	0.67	ug/m3 Air		< 0.67				40	
4-Methyl-2-Pentanone (MIBK)	< 0.67	0.67	ug/m3 Air		< 0.67				40	
Naphthalene	1.3	0.34	ug/m3 Air		< 0.34				40	
Nitrobenzene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Styrene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,1,1,2-Tetrachloroethane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,1,2,2-Tetrachloroethane	< 0.24	0.24	ug/m3 Air		< 0.24				40	
Tetrachloroethene	< 1.7	1.7	ug/m3 Air		< 1.7				40	
Tetrahydrofuran	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Toluene	< 3.4	3.4	ug/m3 Air		< 3.4				40	
1,2,4-Trichlorobenzene	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,1,1-Trichloroethane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.67	0.67	ug/m3 Air		< 0.67				40	
1,1,2-Trichloroethane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
Trichloroethene	< 0.17	0.17	ug/m3 Air		< 0.17				40	
Trichlorofluoromethane	0.84	0.34	ug/m3 Air		0.88				40	
1,2,3-Trichloropropane	< 0.34	0.34	ug/m3 Air		< 0.34				40	
1,2,4-Trimethylbenzene	1.1	0.67	ug/m3 Air		0.88				40	
1,3,5-Trimethylbenzene	< 0.67	0.67	ug/m3 Air		< 0.67				40	
Vinyl chloride	< 0.67	0.67	ug/m3 Air		< 0.67				40	
Xylenes (total)	6.7	1.7	ug/m3 Air		5.4				40	
Surrogate: Toluene-d8	*0.0940*		*ug*	*0.125*		*75*	*60-130*			

QC Qualifiers:

RPD Relative percent difference (RPD) of duplicate analysis are outside of control limits for unknown reason(s).
SPK The recovery of this analyte was outside of established control limits.

Analytical Report

Work Order: AWD0187

Project Description

Westmount - Calgary

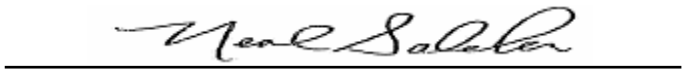
For:

Julie Burghardt

Golder Associates Ltd.

500-4260 Still Creek Drive

Burnaby, British Columbia, CANADA V5C6C6



Neal Salcher

Project Manager

Neal.Salcher@testamericainc.com

Thursday, May 16, 2013

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

14050 Summit Drive, Suite A100 Austin, TX 78728 * 512-244-0855 * Fax 512-244-0160

Golder Associates Ltd. 500-4260 Still Creek Drive Burnaby, British Columbia, CANADA V5C6C6 Julie Burghardt	Work Order: Project: Project Number:	AWD0187 AENV Canada Creosote 11-1324-0164	Received: Reported:	04/29/13 08:15 05/16/13 06:57

May 16, 2013

LABORATORY REPORT

Client:
Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Attn: Julie Burghardt

Work Order: AWD0187
Project Name: AENV Canada Creosote
Project Number: 11-1324-0164
Date Received: 04/29/13

TestAmerica Laboratories, Inc. certifies that the analytical results contained herein apply only to the specific sample(s) analyzed.

The Chain(s) of Custody, 2 pages, are included and are an integral part of this report. This entire report was reviewed and approved for release.

If you have any questions relating to this analytical report, please contact your Laboratory Project Manager at 512-244-0855.

Analyses included in this report were performed by the laboratory shown at the top of this report unless otherwise indicated.

11-1324-0164

This report contains results for the samples received under chain-of-custody by TestAmerica Laboratories, Inc. 4/29/2013 8:15:00 AM .

These samples are associated with your **AENV Canada Creosote** project.

All samples were received in good condition and within temperature requirements.

All applicable quality control procedures met method specified acceptance criteria except where flagged on the result pages, noted on the C-O-C Addendum, and/or detailed in the case narrative.

If you should have any questions, please feel free to contact me at neal.salcher@testamericainc.com or (512) 310-5215.

Note that if this report contains tests performed for the following methods, the associated method deviations are applicable.
EPA 624: The laboratory uses a different desorb time and purge volume than stated in the method.
EPA TO-12: Samples not analyzed in duplicate.
EPA TO-14A and TO-15: Zero humidified nitrogen is used in place of air for method blanks.

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Golder Associates Ltd.	Work Order:	AWD0187	Received: 04/29/13 08:15
500-4260 Still Creek Drive			Reported: 05/16/13 06:57
Burnaby, British Columbia, CANADA V5C6C6	Project:	AENV Canada Creosote	
Julie Burghardt	Project Number:	11-1324-0164	

Approved By:

Neal Salcher
Project Manager

NELAP Certification # T104704217-10-6

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

SAMPLE IDENTIFICATION	LAB NUMBER	COLLECTION	MATRIX	CONTAINER TYPE
MW10-11 WELL	AWD0187-01	04/24/13 13:03	Air	Passivated Canister
MW10-16 WELL	AWD0187-02	04/24/13 15:48	Air	Passivated Canister
MW10-7B DEEP PROBE	AWD0187-03	04/24/13 17:16	Air	Passivated Canister
MW10-6 WELL A	AWD0187-04	04/25/13 10:38	Air	Passivated Canister
MW10-6 WELL B	AWD0187-05	04/25/13 10:38	Air	Passivated Canister
MW10-15 WELL	AWD0187-06	04/25/13 14:13	Air	Passivated Canister

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-01 (MW10-11 WELL - Air) **Sampled: 04/24/13 13:03**

EPA TO15 - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Ethene	**1.03**	RA,J	ug/m³ Air	0.107	1.20	5.23	05/03/13 19:42	VMSC	KRW	13E0020
Acetylene	ND	RA,U	ug/m³ Air	0.158	1.11	5.23	05/03/13 19:42	VMSC	KRW	13E0020
Ethane	**0.658**	RA,J	ug/m³ Air	0.0899	1.29	5.23	05/03/13 19:42	VMSC	KRW	13E0020
Halocarbon 134A	ND	U	ug/m³ Air	1.11	4.36	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Propylene	ND	U	ug/m³ Air	0.247	1.80	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Chlorodifluoromethane	ND	U	ug/m³ Air	0.323	3.70	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Propane	**2.50**		ug/m³ Air	1.85	1.88	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Dichlorodifluoromethane	**2.65**	J	ug/m³ Air	0.605	5.17	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Chloromethane	ND	U	ug/m³ Air	0.155	2.16	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Isobutane	**4.00**		ug/m³ Air	0.315	2.48	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ug/m³ Air	2.68	7.31	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Acetaldehyde	ND	U	ug/m³ Air	0.388	1.88	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Vinyl chloride	ND	U	ug/m³ Air	0.387	2.67	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1-Butene/Isobutene	ND	U	ug/m³ Air	0.272	2.40	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,3-Butadiene	ND	U	ug/m³ Air	0.220	2.31	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Butane	**1.08**	J	ug/m³ Air	0.227	2.48	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Methanol	**11.2**		ug/m³ Air	0.401	1.37	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
trans-2-Butene	ND	U	ug/m³ Air	0.249	2.40	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Neopentane	ND	U	ug/m³ Air	0.379	3.08	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Dichlorofluoromethane	ND	U	ug/m³ Air	0.561	4.40	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Bromomethane	ND	U	ug/m³ Air	0.643	4.06	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
cis-2-Butene	ND	U	ug/m³ Air	0.210	2.40	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Chloroethane	ND	U	ug/m³ Air	0.342	2.76	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Vinyl bromide	ND	U	ug/m³ Air	1.18	4.57	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
3-Methyl-1-butene	ND	U	ug/m³ Air	0.333	3.00	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Ethanol	**0.985**	J	ug/m³ Air	0.508	1.97	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Acetonitrile	ND	U	ug/m³ Air	0.456	1.75	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Isopentane	**2.18**	J	ug/m³ Air	0.160	3.08	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Trichlorofluoromethane	**0.978**	J	ug/m³ Air	0.417	5.87	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1-Pentene	ND	U	ug/m³ Air	0.237	3.00	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Acetone	**2.66**	B	ug/m³ Air	0.184	2.48	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Isopropyl alcohol	**0.388**	J	ug/m³ Air	0.208	2.57	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Acrylonitrile	ND	U	ug/m³ Air	0.290	2.27	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
n-Pentane	**0.560**	J	ug/m³ Air	0.207	3.08	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Diethyl ether	ND	U	ug/m³ Air	0.252	3.17	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Isoprene	ND	U	ug/m³ Air	0.336	2.91	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
trans-2-Pentene	ND	U	ug/m³ Air	0.370	3.00	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,1-Dichloroethene	ND	U	ug/m³ Air	0.249	4.14	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
cis-2-Pentene	ND	U	ug/m³ Air	0.458	3.00	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Methylene chloride	ND	U	ug/m³ Air	0.332	3.63	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-01 (MW10-11 WELL - Air) - cont. **Sampled: 04/24/13 13:03**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
2-Methyl-2-butene	ND	U	ug/m³ Air	0.568	3.00	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Carbon disulfide	ND	U	ug/m³ Air	0.731	3.25	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Allyl chloride	ND	U	ug/m³ Air	0.499	3.27	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,1,2-Trichlorotrifluoroethane	ND	U	ug/m³ Air	1.05	8.01	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2,2-Dimethylbutane	ND	U	ug/m³ Air	0.425	3.68	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Cyclopentene	ND	U	ug/m³ Air	0.371	2.91	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
trans-1,2-Dichloroethene	ND	U	ug/m³ Air	0.532	4.14	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
4-Methyl-1-pentene	ND	U	ug/m³ Air	0.344	3.60	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Propanol	ND	U	ug/m³ Air	0.729	2.57	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,1-Dichloroethane	ND	U	ug/m³ Air	0.419	4.23	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Cyclopentane	ND	U	ug/m³ Air	0.346	3.00	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2,3-Dimethylbutane	ND	U	ug/m³ Air	0.361	3.68	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Methyl tert-Butyl Ether	ND	U	ug/m³ Air	0.413	3.77	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Isohexane	ND	U	ug/m³ Air	0.402	3.68	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Vinyl acetate	ND	U	ug/m³ Air	0.721	3.68	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
cis/trans-4-Methyl-2-pentene	ND	U	ug/m³ Air	0.425	7.20	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Butyraldehyde	ND	U	ug/m³ Air	0.356	3.08	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2-Butanone (MEK)	**3.68**		ug/m³ Air	0.410	3.08	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Chloroprene	ND	U	ug/m³ Air	0.376	3.78	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
3-Methylpentane	ND	U	ug/m³ Air	0.431	3.68	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2-Methyl-1-pentene	ND	U	ug/m³ Air	0.466	3.60	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1-Hexene	ND	U	ug/m³ Air	0.336	3.60	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
cis-1,2-Dichloroethene	ND	U	ug/m³ Air	0.375	4.14	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Bromochloromethane	ND	U	ug/m³ Air	0.730	5.53	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2-Ethyl-1-butene	ND	U	ug/m³ Air	0.900	3.60	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Hexane	ND	U	ug/m³ Air	0.403	3.68	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Chloroform	**8.72**		ug/m³ Air	0.421	5.10	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
cis-3-Hexene	ND	U	ug/m³ Air	0.927	3.60	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
trans-2-Hexene	ND	U	ug/m³ Air	0.326	3.60	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2-Methyl-2-pentene	ND	U	ug/m³ Air	0.241	3.60	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
cis-3-Methyl-2-pentene	ND	U	ug/m³ Air	0.252	3.60	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
cis-2-Hexene	ND	U	ug/m³ Air	0.356	3.60	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Methylcyclopentane	ND	U	ug/m³ Air	0.353	3.60	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,2-Dichloroethane	ND	U	ug/m³ Air	0.294	4.23	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2,4-Dimethylpentane	ND	U	ug/m³ Air	0.392	4.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,1,1-Trichloroethane	ND	U	ug/m³ Air	0.553	5.70	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1-Methylcyclopentene	ND	U	ug/m³ Air	0.0860	3.51	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Benzene	ND	U	ug/m³ Air	0.349	3.34	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Carbon tetrachloride	ND	U	ug/m³ Air	1.79	6.57	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
n-Butanol	ND	U	ug/m³ Air	0.790	3.17	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-01 (MW10-11 WELL - Air) - cont. **Sampled: 04/24/13 13:03**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Cyclohexane	ND	U	ug/m³ Air	0.446	3.60	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Isoheptane	ND	U	ug/m³ Air	0.291	4.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2,3-Dimethylpentane	ND	U	ug/m³ Air	0.353	4.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Cyclohexene	ND	U	ug/m³ Air	0.886	3.51	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
3-Methylhexane	ND	U	ug/m³ Air	0.370	4.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,2-Dichloropropane	ND	U	ug/m³ Air	0.384	4.83	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Bromodichloromethane	ND	U	ug/m³ Air	1.64	7.00	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Trichloroethene	**11.8**		ug/m³ Air	0.379	5.62	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,4-Dioxane	ND	U	ug/m³ Air	0.748	3.77	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1-Heptene	ND	U	ug/m³ Air	0.478	4.20	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2,2,4-Trimethylpentane	ND	U	ug/m³ Air	0.481	4.88	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
trans-3-Heptene	ND	U	ug/m³ Air	0.630	4.20	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Heptane	ND	U	ug/m³ Air	0.351	4.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
cis-3-Heptene	ND	U	ug/m³ Air	0.818	4.20	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
trans-2-Heptene	ND	U	ug/m³ Air	1.08	4.20	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-1-pentene	ND	U	ug/m³ Air	1.22	4.80	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
cis-1,3-Dichloropropene	ND	U	ug/m³ Air	0.500	4.74	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
4-Methyl-2-pentanone (MIBK)	ND	U	ug/m³ Air	0.813	4.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Methylcyclohexane	ND	U	ug/m³ Air	0.504	4.20	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-2-pentene	ND	U	ug/m³ Air	0.489	4.80	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2,5-Dimethylhexane	ND	U	ug/m³ Air	0.349	4.88	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2,2,3-Trimethylpentane	ND	U	ug/m³ Air	0.539	4.88	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
trans-1,3-Dichloropropene	ND	U	ug/m³ Air	0.714	4.74	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,1,2-Trichloroethane	ND	U	ug/m³ Air	0.576	5.70	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2,3,4-Trimethylpentane	ND	U	ug/m³ Air	0.288	4.88	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Toluene	**1.81**	J	ug/m³ Air	0.303	3.94	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2-Hexanone	ND	U	ug/m³ Air	1.09	4.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2-Methylheptane	ND	U	ug/m³ Air	0.422	4.88	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1-Methylcyclohexene	ND	U	ug/m³ Air	1.10	4.11	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Chlorodibromomethane	ND	U	ug/m³ Air	2.18	8.90	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
3-Methylheptane	ND	U	ug/m³ Air	0.329	4.88	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Hexanal	ND	U	ug/m³ Air	1.25	4.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,2-Dibromoethane (EDB)	ND	U	ug/m³ Air	0.803	8.03	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2,2,5-Trimethylhexane	ND	U	ug/m³ Air	0.419	5.48	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1-Octene	ND	U	ug/m³ Air	1.20	4.80	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
n-Octane	ND	U	ug/m³ Air	0.500	4.88	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Tetrachloroethene	ND	U	ug/m³ Air	0.592	7.09	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
cis-2-Octene	ND	U	ug/m³ Air	1.26	4.80	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Chlorobenzene	ND	U	ug/m³ Air	0.349	4.81	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Ethylbenzene	ND	U	ug/m³ Air	0.635	4.54	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024

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Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-01 (MW10-11 WELL - Air) - cont. **Sampled: 04/24/13 13:03**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
m-Xylene & p-Xylene	ND	U	ug/m³ Air	1.39	9.07	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Bromoform	ND	U	ug/m³ Air	1.57	10.8	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Butyl acrylate	ND	U	ug/m³ Air	2.46	5.48	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Heptanal	ND	U	ug/m³ Air	1.47	4.88	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Styrene	ND	U	ug/m³ Air	1.19	4.45	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,1,2,2-Tetrachloroethane	ND	U	ug/m³ Air	2.32	7.17	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
o-Xylene	ND	U	ug/m³ Air	0.699	4.54	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Xylenes, total	ND	U	ug/m³ Air	2.08	13.6	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1-Nonene	ND	U	ug/m³ Air	0.785	5.39	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
4-Nonene	ND	U	ug/m³ Air	4.46	10.8	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
n-Nonane	**0.839**	J	ug/m³ Air	0.781	5.48	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Isopropylbenzene	ND	U	ug/m³ Air	0.663	5.14	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Benzaldehyde	ND	U	ug/m³ Air	1.14	4.54	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
alpha-Pinene	ND	U	ug/m³ Air	0.728	5.82	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2 & 3-Chlorotoluene	ND	U	ug/m³ Air	2.89	10.8	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
4-Chlorotoluene	ND	U	ug/m³ Air	1.46	5.41	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
n-Propylbenzene	ND	U	ug/m³ Air	1.04	5.14	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
3-Ethyltoluene	ND	U	ug/m³ Air	0.943	5.14	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
4-Ethyltoluene	ND	U	ug/m³ Air	1.10	5.14	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,3,5-Trimethylbenzene	ND	U	ug/m³ Air	0.845	5.14	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
2-Ethyltoluene	ND	U	ug/m³ Air	0.814	5.14	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
beta-Pinene	ND	U	ug/m³ Air	1.87	5.82	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,2,4-Trimethylbenzene	ND	U	ug/m³ Air	0.948	5.14	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
tert-Butylbenzene	ND	U	ug/m³ Air	0.450	5.74	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1-Decene	ND	U	ug/m³ Air	1.47	6.00	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Benzyl chloride	ND	U	ug/m³ Air	1.49	5.41	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,3-Dichlorobenzene	ND	U	ug/m³ Air	1.65	6.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
n-Decane	**2.13**	J	ug/m³ Air	1.04	6.08	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,4-Dichlorobenzene	ND	U	ug/m³ Air	1.34	6.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Isobutylbenzene	ND	U	ug/m³ Air	0.932	5.74	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,2,3-Trimethylbenzene	ND	U	ug/m³ Air	0.722	5.14	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
4-Isopropyltoluene	ND	U	ug/m³ Air	1.96	5.74	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,2-Dichlorobenzene	ND	U	ug/m³ Air	2.09	6.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Limonene	ND	U	ug/m³ Air	0.725	5.82	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Indan	ND	U	ug/m³ Air	1.15	5.05	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Indene	ND	U	ug/m³ Air	0.710	4.97	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,3-Diethylbenzene	ND	U	ug/m³ Air	1.40	5.74	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,4-Diethylbenzene	ND	U	ug/m³ Air	1.43	5.74	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
n-Butylbenzene	ND	U	ug/m³ Air	0.407	5.74	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1-Undecene	ND	U	ug/m³ Air	0.907	6.59	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AWD0187-01 (MW10-11 WELL - Air) - cont.							**Sampled: 04/24/13 13:03**			
EPA TO15 - Volatile Organic Compounds by GC/MS - cont.										
n-Undecane	ND	U	ug/m³ Air	0.838	6.68	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,2,4-Trichlorobenzene	ND	U	ug/m³ Air	0.900	7.76	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Naphthalene	ND	U	ug/m³ Air	1.15	5.48	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Hexachlorobutadiene	ND	U	ug/m³ Air	1.73	11.1	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
1,2-Dichloroethene, Total	ND	U	ug/m³ Air	0.890	8.28	5.23	05/06/13 13:59	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*89 %*						05/06/13 13:59	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*94 %*	*RA*					05/03/13 19:42	VMSC	KRW	13E0020
Surr: Fluorobenzene (46-118%)	*73 %*						05/06/13 13:59	GCMSR1	KRW	13E0024
Surr: Fluorobenzene (46-118%)	*92 %*	*RA*					05/03/13 19:42	VMSC	KRW	13E0020
Surr: Toluene-d8 (70-136%)	*105 %*						05/06/13 13:59	GCMSR1	KRW	13E0024
Surr: Toluene-d8 (70-136%)	*96 %*	*RA*					05/03/13 19:42	VMSC	KRW	13E0020
Surr: 1,4-Dichlorobutane (38-135%)	*100 %*						05/06/13 13:59	GCMSR1	KRW	13E0024
Surr: 1,4-Dichlorobutane (38-135%)	*95 %*	*RA*					05/03/13 19:42	VMSC	KRW	13E0020
Surr: 4-Bromofluorobenzene (51-128%)	*95 %*						05/06/13 13:59	GCMSR1	KRW	13E0024
Surr: 4-Bromofluorobenzene (51-128%)	*95 %*	*RA*					05/03/13 19:42	VMSC	KRW	13E0020

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AWD0187-02 (MW10-16 WELL - Air)							**Sampled: 04/24/13 15:48**			
EPA TO15 - Volatile Organic Compounds by GC/MS										
Ethene	**1.38**	RA	ug/m³ Air	0.116	1.30	5.66	05/03/13 21:48	VMSC	KRW	13E0020
Acetylene	ND	RA,U	ug/m³ Air	0.171	1.21	5.66	05/03/13 21:48	VMSC	KRW	13E0020
Ethane	**0.672**	RA,J	ug/m³ Air	0.0974	1.39	5.66	05/03/13 21:48	VMSC	KRW	13E0020
Halocarbon 134A	**1.72**	J	ug/m³ Air	1.20	4.72	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Propylene	ND	U	ug/m³ Air	0.268	1.95	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Chlorodifluoromethane	ND	U	ug/m³ Air	0.350	4.00	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Propane	**3.29**		ug/m³ Air	2.00	2.04	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Dichlorodifluoromethane	**2.52**	J	ug/m³ Air	0.655	5.60	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Chloromethane	ND	U	ug/m³ Air	0.168	2.34	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Isobutane	**2.48**	J	ug/m³ Air	0.342	2.69	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ug/m³ Air	2.91	7.91	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Acetaldehyde	**2.11**		ug/m³ Air	0.420	2.04	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Vinyl chloride	ND	U	ug/m³ Air	0.420	2.89	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1-Butene/Isobutene	ND	U	ug/m³ Air	0.295	2.60	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,3-Butadiene	ND	U	ug/m³ Air	0.238	2.50	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Butane	**1.22**	J	ug/m³ Air	0.246	2.69	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Methanol	**9.12**		ug/m³ Air	0.434	1.48	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
trans-2-Butene	ND	U	ug/m³ Air	0.270	2.60	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Neopentane	ND	U	ug/m³ Air	0.411	3.34	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Dichlorofluoromethane	ND	U	ug/m³ Air	0.607	4.76	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Bromomethane	ND	U	ug/m³ Air	0.697	4.40	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
cis-2-Butene	ND	U	ug/m³ Air	0.227	2.60	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Chloroethane	ND	U	ug/m³ Air	0.370	2.99	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Vinyl bromide	ND	U	ug/m³ Air	1.27	4.95	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
3-Methyl-1-butene	ND	U	ug/m³ Air	0.360	3.25	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Ethanol	**0.708**	J	ug/m³ Air	0.550	2.13	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Acetonitrile	ND	U	ug/m³ Air	0.494	1.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Isopentane	**4.32**		ug/m³ Air	0.174	3.34	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Trichlorofluoromethane	**1.04**	J	ug/m³ Air	0.452	6.36	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1-Pentene	ND	U	ug/m³ Air	0.256	3.25	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Acetone	**3.83**	B	ug/m³ Air	0.199	2.69	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Isopropyl alcohol	**0.499**	J	ug/m³ Air	0.225	2.78	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Acrylonitrile	ND	U	ug/m³ Air	0.314	2.46	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
n-Pentane	**0.621**	J	ug/m³ Air	0.224	3.34	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Diethyl ether	ND	U	ug/m³ Air	0.273	3.43	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Isoprene	ND	U	ug/m³ Air	0.364	3.15	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
trans-2-Pentene	ND	U	ug/m³ Air	0.401	3.25	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,1-Dichloroethene	ND	U	ug/m³ Air	0.269	4.49	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
cis-2-Pentene	ND	U	ug/m³ Air	0.497	3.25	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Methylene chloride	ND	U	ug/m³ Air	0.360	3.93	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-02 (MW10-16 WELL - Air) - cont. **Sampled: 04/24/13 15:48**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
2-Methyl-2-butene	ND	U	ug/m³ Air	0.615	3.25	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Carbon disulfide	ND	U	ug/m³ Air	0.791	3.52	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Allyl chloride	ND	U	ug/m³ Air	0.540	3.54	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,1,2-Trichlorotrifluoroethane	ND	U	ug/m³ Air	1.14	8.67	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2,2-Dimethylbutane	ND	U	ug/m³ Air	0.461	3.99	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Cyclopentene	ND	U	ug/m³ Air	0.402	3.15	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
trans-1,2-Dichloroethene	ND	U	ug/m³ Air	0.577	4.49	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
4-Methyl-1-pentene	ND	U	ug/m³ Air	0.372	3.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Propanol	ND	U	ug/m³ Air	0.790	2.78	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,1-Dichloroethane	ND	U	ug/m³ Air	0.454	4.58	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Cyclopentane	ND	U	ug/m³ Air	0.375	3.25	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2,3-Dimethylbutane	ND	U	ug/m³ Air	0.391	3.99	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Methyl tert-Butyl Ether	ND	U	ug/m³ Air	0.447	4.08	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Isohexane	ND	U	ug/m³ Air	0.435	3.99	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Vinyl acetate	ND	U	ug/m³ Air	0.781	3.99	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
cis/trans-4-Methyl-2-pentene	ND	U	ug/m³ Air	0.460	7.80	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Butyraldehyde	**0.778**	J	ug/m³ Air	0.386	3.34	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2-Butanone (MEK)	**3.31**	J	ug/m³ Air	0.444	3.34	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Chloroprene	ND	U	ug/m³ Air	0.408	4.10	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
3-Methylpentane	ND	U	ug/m³ Air	0.467	3.99	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2-Methyl-1-pentene	ND	U	ug/m³ Air	0.505	3.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1-Hexene	ND	U	ug/m³ Air	0.364	3.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
cis-1,2-Dichloroethene	ND	U	ug/m³ Air	0.406	4.49	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Bromochloromethane	ND	U	ug/m³ Air	0.791	5.99	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2-Ethyl-1-butene	ND	U	ug/m³ Air	0.974	3.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Hexane	ND	U	ug/m³ Air	0.437	3.99	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Chloroform	**1.40**	J	ug/m³ Air	0.456	5.53	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
cis-3-Hexene	ND	U	ug/m³ Air	1.00	3.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
trans-2-Hexene	ND	U	ug/m³ Air	0.353	3.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2-Methyl-2-pentene	ND	U	ug/m³ Air	0.261	3.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
cis-3-Methyl-2-pentene	ND	U	ug/m³ Air	0.273	3.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
cis-2-Hexene	ND	U	ug/m³ Air	0.386	3.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Methylcyclopentane	ND	U	ug/m³ Air	0.382	3.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,2-Dichloroethane	ND	U	ug/m³ Air	0.318	4.58	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2,4-Dimethylpentane	ND	U	ug/m³ Air	0.424	4.64	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,1,1-Trichloroethane	ND	U	ug/m³ Air	0.599	6.18	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1-Methylcyclopentene	ND	U	ug/m³ Air	0.0932	3.80	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Benzene	ND	U	ug/m³ Air	0.378	3.62	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Carbon tetrachloride	ND	U	ug/m³ Air	1.94	7.12	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
n-Butanol	ND	U	ug/m³ Air	0.856	3.43	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024

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Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-02 (MW10-16 WELL - Air) - cont. **Sampled: 04/24/13 15:48**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Cyclohexane	ND	U	ug/m³ Air	0.483	3.90	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Isoheptane	ND	U	ug/m³ Air	0.315	4.64	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2,3-Dimethylpentane	ND	U	ug/m³ Air	0.383	4.64	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Cyclohexene	ND	U	ug/m³ Air	0.960	3.80	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
3-Methylhexane	ND	U	ug/m³ Air	0.401	4.64	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,2-Dichloropropane	ND	U	ug/m³ Air	0.416	5.23	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Bromodichloromethane	ND	U	ug/m³ Air	1.78	7.58	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Trichloroethene	**17.1**		ug/m³ Air	0.411	6.08	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,4-Dioxane	ND	U	ug/m³ Air	0.810	4.08	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1-Heptene	ND	U	ug/m³ Air	0.518	4.55	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2,2,4-Trimethylpentane	ND	U	ug/m³ Air	0.521	5.29	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
trans-3-Heptene	ND	U	ug/m³ Air	0.682	4.55	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Heptane	ND	U	ug/m³ Air	0.380	4.64	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
cis-3-Heptene	ND	U	ug/m³ Air	0.886	4.55	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
trans-2-Heptene	ND	U	ug/m³ Air	1.17	4.55	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-1-pentene	ND	U	ug/m³ Air	1.32	5.19	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
cis-1,3-Dichloropropene	ND	U	ug/m³ Air	0.542	5.14	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
4-Methyl-2-pentanone (MIBK)	ND	U	ug/m³ Air	0.881	4.64	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Methylcyclohexane	ND	U	ug/m³ Air	0.545	4.55	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-2-pentene	ND	U	ug/m³ Air	0.530	5.19	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2,5-Dimethylhexane	ND	U	ug/m³ Air	0.378	5.29	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2,2,3-Trimethylpentane	ND	U	ug/m³ Air	0.584	5.29	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
trans-1,3-Dichloropropene	ND	U	ug/m³ Air	0.773	5.14	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,1,2-Trichloroethane	ND	U	ug/m³ Air	0.624	6.18	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2,3,4-Trimethylpentane	ND	U	ug/m³ Air	0.312	5.29	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Toluene	**2.28**	J	ug/m³ Air	0.328	4.27	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2-Hexanone	ND	U	ug/m³ Air	1.18	4.64	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2-Methylheptane	ND	U	ug/m³ Air	0.457	5.29	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1-Methylcyclohexene	ND	U	ug/m³ Air	1.19	4.45	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Chlorodibromomethane	ND	U	ug/m³ Air	2.36	9.64	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
3-Methylheptane	ND	U	ug/m³ Air	0.357	5.29	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Hexanal	ND	U	ug/m³ Air	1.35	4.64	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,2-Dibromoethane (EDB)	ND	U	ug/m³ Air	0.870	8.70	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2,2,5-Trimethylhexane	ND	U	ug/m³ Air	0.454	5.94	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1-Octene	ND	U	ug/m³ Air	1.30	5.19	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
n-Octane	ND	U	ug/m³ Air	0.542	5.29	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Tetrachloroethene	**6.47**	J	ug/m³ Air	0.641	7.68	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
cis-2-Octene	ND	U	ug/m³ Air	1.36	5.19	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Chlorobenzene	ND	U	ug/m³ Air	0.378	5.21	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Ethylbenzene	ND	U	ug/m³ Air	0.688	4.91	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-02 (MW10-16 WELL - Air) - cont. **Sampled: 04/24/13 15:48**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
m-Xylene & p-Xylene	ND	U	ug/m³ Air	1.51	9.83	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Bromoform	ND	U	ug/m³ Air	1.70	11.7	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Butyl acrylate	ND	U	ug/m³ Air	2.66	5.93	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Heptanal	ND	U	ug/m³ Air	1.59	5.29	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Styrene	ND	U	ug/m³ Air	1.29	4.82	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,1,2,2-Tetrachloroethane	ND	U	ug/m³ Air	2.51	7.77	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
o-Xylene	ND	U	ug/m³ Air	0.757	4.91	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Xylenes, total	ND	U	ug/m³ Air	2.25	14.7	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1-Nonene	ND	U	ug/m³ Air	0.850	5.84	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
4-Nonene	ND	U	ug/m³ Air	4.83	11.7	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
n-Nonane	ND	U	ug/m³ Air	0.846	5.94	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Isopropylbenzene	ND	U	ug/m³ Air	0.718	5.56	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Benzaldehyde	ND	U	ug/m³ Air	1.23	4.91	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
alpha-Pinene	ND	U	ug/m³ Air	0.788	6.31	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2 & 3-Chlorotoluene	ND	U	ug/m³ Air	3.14	11.7	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
4-Chlorotoluene	ND	U	ug/m³ Air	1.58	5.86	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
n-Propylbenzene	ND	U	ug/m³ Air	1.12	5.56	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
3-Ethyltoluene	ND	U	ug/m³ Air	1.02	5.56	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
4-Ethyltoluene	ND	U	ug/m³ Air	1.20	5.56	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,3,5-Trimethylbenzene	ND	U	ug/m³ Air	0.915	5.56	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
2-Ethyltoluene	ND	U	ug/m³ Air	0.882	5.56	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
beta-Pinene	ND	U	ug/m³ Air	2.03	6.31	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,2,4-Trimethylbenzene	ND	U	ug/m³ Air	1.03	5.56	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
tert-Butylbenzene	ND	U	ug/m³ Air	0.488	6.21	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1-Decene	ND	U	ug/m³ Air	1.59	6.50	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Benzyl chloride	ND	U	ug/m³ Air	1.61	5.86	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,3-Dichlorobenzene	ND	U	ug/m³ Air	1.78	6.81	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
n-Decane	**1.62**	J	ug/m³ Air	1.13	6.59	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,4-Dichlorobenzene	ND	U	ug/m³ Air	1.45	6.81	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Isobutylbenzene	ND	U	ug/m³ Air	1.01	6.21	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,2,3-Trimethylbenzene	ND	U	ug/m³ Air	0.782	5.56	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
4-Isopropyltoluene	ND	U	ug/m³ Air	2.12	6.21	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,2-Dichlorobenzene	ND	U	ug/m³ Air	2.27	6.81	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Limonene	ND	U	ug/m³ Air	0.785	6.31	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Indan	ND	U	ug/m³ Air	1.25	5.47	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Indene	ND	U	ug/m³ Air	0.769	5.38	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,3-Diethylbenzene	ND	U	ug/m³ Air	1.52	6.21	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,4-Diethylbenzene	ND	U	ug/m³ Air	1.55	6.21	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
n-Butylbenzene	ND	U	ug/m³ Air	0.441	6.21	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1-Undecene	ND	U	ug/m³ Air	0.982	7.14	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AWD0187-02 (MW10-16 WELL - Air) - cont.								**Sampled: 04/24/13 15:48**		
EPA TO15 - Volatile Organic Compounds by GC/MS - cont.										
n-Undecane	ND	U	ug/m³ Air	0.908	7.24	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,2,4-Trichlorobenzene	ND	U	ug/m³ Air	0.974	8.40	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Naphthalene	ND	U	ug/m³ Air	1.25	5.93	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Hexachlorobutadiene	ND	U	ug/m³ Air	1.87	12.1	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
1,2-Dichloroethene, Total	ND	U	ug/m³ Air	0.964	8.97	5.66	05/06/13 14:58	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*90 %*						05/06/13 14:58	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*95 %*	*RA*					05/03/13 21:48	VMSC	KRW	13E0020
Surr: Fluorobenzene (46-118%)	*71 %*						05/06/13 14:58	GCMSR1	KRW	13E0024
Surr: Fluorobenzene (46-118%)	*86 %*	*RA*					05/03/13 21:48	VMSC	KRW	13E0020
Surr: Toluene-d8 (70-136%)	*100 %*						05/06/13 14:58	GCMSR1	KRW	13E0024
Surr: Toluene-d8 (70-136%)	*91 %*	*RA*					05/03/13 21:48	VMSC	KRW	13E0020
Surr: 1,4-Dichlorobutane (38-135%)	*98 %*						05/06/13 14:58	GCMSR1	KRW	13E0024
Surr: 1,4-Dichlorobutane (38-135%)	*89 %*	*RA*					05/03/13 21:48	VMSC	KRW	13E0020
Surr: 4-Bromofluorobenzene (51-128%)	*88 %*						05/06/13 14:58	GCMSR1	KRW	13E0024
Surr: 4-Bromofluorobenzene (51-128%)	*89 %*	*RA*					05/03/13 21:48	VMSC	KRW	13E0020

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Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AWD0187-03 (MW10-7B DEEP PROBE - Air)							**Sampled: 04/24/13 17:16**			
EPA TO15 - Volatile Organic Compounds by GC/MS										
Ethene	**0.440**	RA,J	ug/m³ Air	0.106	1.19	5.2	05/03/13 23:53	VMSC	KRW	13E0020
Acetylene	ND	RA,U	ug/m³ Air	0.157	1.11	5.2	05/03/13 23:53	VMSC	KRW	13E0020
Ethane	**0.370**	RA,J	ug/m³ Air	0.0895	1.28	5.2	05/03/13 23:53	VMSC	KRW	13E0020
Halocarbon 134A	**3.89**	J	ug/m³ Air	1.11	4.34	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Propylene	ND	U	ug/m³ Air	0.246	1.79	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Chlorodifluoromethane	ND	U	ug/m³ Air	0.322	3.68	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Propane	ND	U	ug/m³ Air	1.84	1.88	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Dichlorodifluoromethane	**2.49**	J	ug/m³ Air	0.602	5.14	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Chloromethane	ND	U	ug/m³ Air	0.155	2.15	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Isobutane	**0.675**	J	ug/m³ Air	0.314	2.47	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ug/m³ Air	2.67	7.27	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Acetaldehyde	ND	U	ug/m³ Air	0.386	1.87	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Vinyl chloride	ND	U	ug/m³ Air	0.385	2.66	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1-Butene/Isobutene	ND	U	ug/m³ Air	0.271	2.39	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,3-Butadiene	ND	U	ug/m³ Air	0.219	2.30	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Butane	**0.243**	J	ug/m³ Air	0.226	2.47	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Methanol	**1.59**		ug/m³ Air	0.399	1.36	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
trans-2-Butene	ND	U	ug/m³ Air	0.248	2.39	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Neopentane	ND	U	ug/m³ Air	0.377	3.07	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Dichlorofluoromethane	ND	U	ug/m³ Air	0.558	4.38	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Bromomethane	ND	U	ug/m³ Air	0.640	4.04	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
cis-2-Butene	ND	U	ug/m³ Air	0.209	2.39	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Chloroethane	ND	U	ug/m³ Air	0.340	2.74	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Vinyl bromide	ND	U	ug/m³ Air	1.17	4.55	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
3-Methyl-1-butene	ND	U	ug/m³ Air	0.331	2.98	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Ethanol	ND	U	ug/m³ Air	0.506	1.96	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Acetonitrile	ND	U	ug/m³ Air	0.454	1.75	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Isopentane	**1.12**	J	ug/m³ Air	0.160	3.07	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Trichlorofluoromethane	**1.19**	J	ug/m³ Air	0.415	5.84	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1-Pentene	ND	U	ug/m³ Air	0.236	2.98	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Acetone	**2.04**	J, B	ug/m³ Air	0.183	2.47	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Isopropyl alcohol	ND	U	ug/m³ Air	0.207	2.56	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Acrylonitrile	ND	U	ug/m³ Air	0.289	2.26	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
n-Pentane	ND	U	ug/m³ Air	0.206	3.07	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Diethyl ether	ND	U	ug/m³ Air	0.251	3.15	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Isoprene	ND	U	ug/m³ Air	0.335	2.90	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
trans-2-Pentene	ND	U	ug/m³ Air	0.368	2.98	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,1-Dichloroethene	ND	U	ug/m³ Air	0.247	4.12	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
cis-2-Pentene	ND	U	ug/m³ Air	0.456	2.98	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Methylene chloride	ND	U	ug/m³ Air	0.330	3.61	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-03 (MW10-7B DEEP PROBE - Air) - cont. **Sampled: 04/24/13 17:16**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
2-Methyl-2-butene	ND	U	ug/m³ Air	0.565	2.98	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Carbon disulfide	ND	U	ug/m³ Air	0.727	3.24	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Allyl chloride	ND	U	ug/m³ Air	0.496	3.25	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,1,2-Trichlorotrifluoroethane	ND	U	ug/m³ Air	1.05	7.97	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2,2-Dimethylbutane	ND	U	ug/m³ Air	0.423	3.67	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Cyclopentene	ND	U	ug/m³ Air	0.369	2.90	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
trans-1,2-Dichloroethene	ND	U	ug/m³ Air	0.530	4.12	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
4-Methyl-1-pentene	ND	U	ug/m³ Air	0.342	3.58	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Propanol	ND	U	ug/m³ Air	0.726	2.56	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,1-Dichloroethane	ND	U	ug/m³ Air	0.417	4.21	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Cyclopentane	ND	U	ug/m³ Air	0.344	2.98	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2,3-Dimethylbutane	ND	U	ug/m³ Air	0.359	3.67	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Methyl tert-Butyl Ether	ND	U	ug/m³ Air	0.411	3.75	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Isohexane	ND	U	ug/m³ Air	0.400	3.67	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Vinyl acetate	ND	U	ug/m³ Air	0.718	3.66	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
cis/trans-4-Methyl-2-pentene	ND	U	ug/m³ Air	0.423	7.16	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Butyraldehyde	ND	U	ug/m³ Air	0.354	3.07	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2-Butanone (MEK)	**0.531**	J	ug/m³ Air	0.408	3.07	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Chloroprene	ND	U	ug/m³ Air	0.375	3.76	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
3-Methylpentane	ND	U	ug/m³ Air	0.429	3.67	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2-Methyl-1-pentene	ND	U	ug/m³ Air	0.464	3.58	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1-Hexene	ND	U	ug/m³ Air	0.335	3.58	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
cis-1,2-Dichloroethene	ND	U	ug/m³ Air	0.373	4.12	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Bromochloromethane	ND	U	ug/m³ Air	0.726	5.50	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2-Ethyl-1-butene	ND	U	ug/m³ Air	0.895	3.58	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Hexane	ND	U	ug/m³ Air	0.401	3.67	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Chloroform	**3.87**	J	ug/m³ Air	0.419	5.08	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
cis-3-Hexene	ND	U	ug/m³ Air	0.922	3.58	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
trans-2-Hexene	ND	U	ug/m³ Air	0.324	3.58	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2-Methyl-2-pentene	ND	U	ug/m³ Air	0.240	3.58	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
cis-3-Methyl-2-pentene	ND	U	ug/m³ Air	0.251	3.58	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
cis-2-Hexene	ND	U	ug/m³ Air	0.355	3.58	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Methylcyclopentane	ND	U	ug/m³ Air	0.351	3.58	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,2-Dichloroethane	ND	U	ug/m³ Air	0.293	4.21	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2,4-Dimethylpentane	ND	U	ug/m³ Air	0.390	4.26	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,1,1-Trichloroethane	ND	U	ug/m³ Air	0.550	5.67	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1-Methylcyclopentene	ND	U	ug/m³ Air	0.0856	3.49	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Benzene	ND	U	ug/m³ Air	0.347	3.32	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Carbon tetrachloride	ND	U	ug/m³ Air	1.78	6.54	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
n-Butanol	ND	U	ug/m³ Air	0.786	3.15	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-03 (MW10-7B DEEP PROBE - Air) - cont. **Sampled: 04/24/13 17:16**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Cyclohexane	ND	U	ug/m³ Air	0.444	3.58	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Isoheptane	ND	U	ug/m³ Air	0.290	4.26	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2,3-Dimethylpentane	ND	U	ug/m³ Air	0.352	4.26	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Cyclohexene	ND	U	ug/m³ Air	0.882	3.49	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
3-Methylhexane	ND	U	ug/m³ Air	0.369	4.26	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,2-Dichloropropane	ND	U	ug/m³ Air	0.382	4.81	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Bromodichloromethane	ND	U	ug/m³ Air	1.63	6.97	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Trichloroethene	**3.20**	J	ug/m³ Air	0.377	5.59	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,4-Dioxane	ND	U	ug/m³ Air	0.744	3.75	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1-Heptene	ND	U	ug/m³ Air	0.476	4.18	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2,2,4-Trimethylpentane	ND	U	ug/m³ Air	0.479	4.86	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
trans-3-Heptene	ND	U	ug/m³ Air	0.626	4.18	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Heptane	ND	U	ug/m³ Air	0.349	4.26	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
cis-3-Heptene	ND	U	ug/m³ Air	0.814	4.18	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
trans-2-Heptene	ND	U	ug/m³ Air	1.08	4.18	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-1-pentene	ND	U	ug/m³ Air	1.22	4.77	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
cis-1,3-Dichloropropene	ND	U	ug/m³ Air	0.498	4.72	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
4-Methyl-2-pentanone (MIBK)	ND	U	ug/m³ Air	0.809	4.26	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Methylcyclohexane	ND	U	ug/m³ Air	0.501	4.18	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-2-pentene	ND	U	ug/m³ Air	0.487	4.77	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2,5-Dimethylhexane	ND	U	ug/m³ Air	0.347	4.86	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2,2,3-Trimethylpentane	ND	U	ug/m³ Air	0.537	4.86	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
trans-1,3-Dichloropropene	ND	U	ug/m³ Air	0.710	4.72	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,1,2-Trichloroethane	ND	U	ug/m³ Air	0.573	5.67	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2,3,4-Trimethylpentane	ND	U	ug/m³ Air	0.287	4.86	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Toluene	**23.0**		ug/m³ Air	0.302	3.92	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2-Hexanone	ND	U	ug/m³ Air	1.09	4.26	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2-Methylheptane	ND	U	ug/m³ Air	0.420	4.86	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1-Methylcyclohexene	ND	U	ug/m³ Air	1.09	4.09	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Chlorodibromomethane	ND	U	ug/m³ Air	2.17	8.86	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
3-Methylheptane	ND	U	ug/m³ Air	0.328	4.86	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Hexanal	ND	U	ug/m³ Air	1.24	4.26	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,2-Dibromoethane (EDB)	ND	U	ug/m³ Air	0.799	7.99	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2,2,5-Trimethylhexane	ND	U	ug/m³ Air	0.417	5.46	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1-Octene	ND	U	ug/m³ Air	1.19	4.77	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
n-Octane	ND	U	ug/m³ Air	0.498	4.86	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Tetrachloroethene	ND	U	ug/m³ Air	0.589	7.05	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
cis-2-Octene	ND	U	ug/m³ Air	1.25	4.77	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Chlorobenzene	ND	U	ug/m³ Air	0.347	4.79	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Ethylbenzene	ND	U	ug/m³ Air	0.632	4.51	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-03 (MW10-7B DEEP PROBE - Air) - cont. **Sampled: 04/24/13 17:16**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
m-Xylene & p-Xylene	ND	U	ug/m³ Air	1.39	9.03	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Bromoform	ND	U	ug/m³ Air	1.56	10.7	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Butyl acrylate	ND	U	ug/m³ Air	2.45	5.45	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Heptanal	ND	U	ug/m³ Air	1.46	4.86	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Styrene	ND	U	ug/m³ Air	1.18	4.43	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,1,2,2-Tetrachloroethane	ND	U	ug/m³ Air	2.31	7.14	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
o-Xylene	ND	U	ug/m³ Air	0.695	4.51	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Xylenes, total	ND	U	ug/m³ Air	2.07	13.5	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1-Nonene	ND	U	ug/m³ Air	0.781	5.37	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
4-Nonene	ND	U	ug/m³ Air	4.44	10.7	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
n-Nonane	ND	U	ug/m³ Air	0.777	5.45	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Isopropylbenzene	ND	U	ug/m³ Air	0.659	5.11	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Benzaldehyde	ND	U	ug/m³ Air	1.13	4.51	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
alpha-Pinene	ND	U	ug/m³ Air	0.724	5.79	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2 & 3-Chlorotoluene	ND	U	ug/m³ Air	2.88	10.8	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
4-Chlorotoluene	ND	U	ug/m³ Air	1.45	5.38	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
n-Propylbenzene	ND	U	ug/m³ Air	1.03	5.11	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
3-Ethyltoluene	ND	U	ug/m³ Air	0.938	5.11	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
4-Ethyltoluene	ND	U	ug/m³ Air	1.10	5.11	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,3,5-Trimethylbenzene	ND	U	ug/m³ Air	0.841	5.11	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
2-Ethyltoluene	ND	U	ug/m³ Air	0.810	5.11	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
beta-Pinene	ND	U	ug/m³ Air	1.86	5.79	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,2,4-Trimethylbenzene	ND	U	ug/m³ Air	0.943	5.11	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
tert-Butylbenzene	ND	U	ug/m³ Air	0.448	5.71	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1-Decene	ND	U	ug/m³ Air	1.46	5.97	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Benzyl chloride	ND	U	ug/m³ Air	1.48	5.38	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,3-Dichlorobenzene	ND	U	ug/m³ Air	1.64	6.25	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
n-Decane	ND	U	ug/m³ Air	1.03	6.05	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,4-Dichlorobenzene	ND	U	ug/m³ Air	1.33	6.25	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Isobutylbenzene	ND	U	ug/m³ Air	0.927	5.71	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,2,3-Trimethylbenzene	ND	U	ug/m³ Air	0.718	5.11	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
4-Isopropyltoluene	ND	U	ug/m³ Air	1.95	5.71	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,2-Dichlorobenzene	ND	U	ug/m³ Air	2.08	6.25	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Limonene	ND	U	ug/m³ Air	0.721	5.79	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Indan	ND	U	ug/m³ Air	1.15	5.03	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Indene	ND	U	ug/m³ Air	0.707	4.94	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,3-Diethylbenzene	ND	U	ug/m³ Air	1.40	5.71	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,4-Diethylbenzene	ND	U	ug/m³ Air	1.42	5.71	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
n-Butylbenzene	ND	U	ug/m³ Air	0.405	5.71	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1-Undecene	ND	U	ug/m³ Air	0.902	6.56	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AWD0187-03 (MW10-7B DEEP PROBE - Air) - cont.							**Sampled: 04/24/13 17:16**			
EPA TO15 - Volatile Organic Compounds by GC/MS - cont.										
n-Undecane	ND	U	ug/m³ Air	0.834	6.65	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,2,4-Trichlorobenzene	ND	U	ug/m³ Air	0.895	7.72	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Naphthalene	ND	U	ug/m³ Air	1.14	5.45	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Hexachlorobutadiene	ND	U	ug/m³ Air	1.72	11.1	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
1,2-Dichloroethene, Total	ND	U	ug/m³ Air	0.886	8.24	5.2	05/06/13 15:57	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*89 %*						05/06/13 15:57	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*95 %*	*RA*					05/03/13 23:53	VMSC	KRW	13E0020
Surr: Fluorobenzene (46-118%)	*72 %*						05/06/13 15:57	GCMSR1	KRW	13E0024
Surr: Fluorobenzene (46-118%)	*85 %*	*RA*					05/03/13 23:53	VMSC	KRW	13E0020
Surr: Toluene-d8 (70-136%)	*106 %*						05/06/13 15:57	GCMSR1	KRW	13E0024
Surr: Toluene-d8 (70-136%)	*96 %*	*RA*					05/03/13 23:53	VMSC	KRW	13E0020
Surr: 1,4-Dichlorobutane (38-135%)	*100 %*						05/06/13 15:57	GCMSR1	KRW	13E0024
Surr: 1,4-Dichlorobutane (38-135%)	*95 %*	*RA*					05/03/13 23:53	VMSC	KRW	13E0020
Surr: 4-Bromofluorobenzene (51-128%)	*93 %*						05/06/13 15:57	GCMSR1	KRW	13E0024
Surr: 4-Bromofluorobenzene (51-128%)	*94 %*	*RA*					05/03/13 23:53	VMSC	KRW	13E0020

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Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AWD0187-04 (MW10-6 WELL A - Air)								**Sampled: 04/25/13 10:38**		
EPA TO15 - Volatile Organic Compounds by GC/MS										
Ethene	**1.55**	RA,J	ug/m³ Air	0.763	8.56	37.3	05/04/13 01:55	VMSC	KRW	13E0020
Acetylene	ND	RA,U	ug/m³ Air	1.13	7.95	37.3	05/04/13 01:55	VMSC	KRW	13E0020
Ethane	**2.06**	RA,J	ug/m³ Air	0.642	9.18	37.3	05/04/13 01:55	VMSC	KRW	13E0020
Halocarbon 134A	ND	U	ug/m³ Air	7.94	31.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Propylene	ND	U	ug/m³ Air	1.77	12.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Chlorodifluoromethane	ND	U	ug/m³ Air	2.31	26.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Propane	ND	U	ug/m³ Air	13.2	13.5	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Dichlorodifluoromethane	ND	U	ug/m³ Air	4.32	36.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Chloromethane	ND	U	ug/m³ Air	1.11	15.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Isobutane	ND	U	ug/m³ Air	2.25	17.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ug/m³ Air	19.2	52.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Acetaldehyde	ND	U	ug/m³ Air	2.77	13.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Vinyl chloride	ND	U	ug/m³ Air	2.77	19.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1-Butene/Isobutene	ND	U	ug/m³ Air	1.94	17.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,3-Butadiene	ND	U	ug/m³ Air	1.57	16.5	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Butane	ND	U	ug/m³ Air	1.62	17.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Methanol	**5.09**	J	ug/m³ Air	2.86	9.78	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
trans-2-Butene	ND	U	ug/m³ Air	1.78	17.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Neopentane	ND	U	ug/m³ Air	2.71	22.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Dichlorofluoromethane	ND	U	ug/m³ Air	4.00	31.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Bromomethane	ND	U	ug/m³ Air	4.59	29.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
cis-2-Butene	ND	U	ug/m³ Air	1.50	17.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Chloroethane	ND	U	ug/m³ Air	2.44	19.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Vinyl bromide	ND	U	ug/m³ Air	8.40	32.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
3-Methyl-1-butene	ND	U	ug/m³ Air	2.37	21.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Ethanol	ND	U	ug/m³ Air	3.63	14.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Acetonitrile	ND	U	ug/m³ Air	3.26	12.5	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Isopentane	**1.38**	J	ug/m³ Air	1.14	22.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Trichlorofluoromethane	ND	U	ug/m³ Air	2.98	41.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1-Pentene	ND	U	ug/m³ Air	1.69	21.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Acetone	**5.11**	B, J	ug/m³ Air	1.31	17.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Isopropyl alcohol	ND	U	ug/m³ Air	1.49	18.3	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Acrylonitrile	ND	U	ug/m³ Air	2.07	16.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
n-Pentane	ND	U	ug/m³ Air	1.48	22.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Diethyl ether	ND	U	ug/m³ Air	1.80	22.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Isoprene	ND	U	ug/m³ Air	2.40	20.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
trans-2-Pentene	ND	U	ug/m³ Air	2.64	21.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,1-Dichloroethene	ND	U	ug/m³ Air	1.77	29.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
cis-2-Pentene	ND	U	ug/m³ Air	3.27	21.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Methylene chloride	ND	U	ug/m³ Air	2.37	25.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024

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500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-04 (MW10-6 WELL A - Air) - cont. **Sampled: 04/25/13 10:38**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
2-Methyl-2-butene	ND	U	ug/m³ Air	4.05	21.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Carbon disulfide	ND	U	ug/m³ Air	5.22	23.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Allyl chloride	ND	U	ug/m³ Air	3.56	23.3	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,1,2-Trichlorotrifluoroethane	ND	U	ug/m³ Air	7.52	57.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2,2-Dimethylbutane	ND	U	ug/m³ Air	3.04	26.3	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Cyclopentene	ND	U	ug/m³ Air	2.65	20.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
trans-1,2-Dichloroethene	ND	U	ug/m³ Air	3.80	29.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
4-Methyl-1-pentene	ND	U	ug/m³ Air	2.45	25.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Propanol	ND	U	ug/m³ Air	5.21	18.3	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,1-Dichloroethane	ND	U	ug/m³ Air	2.99	30.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Cyclopentane	ND	U	ug/m³ Air	2.47	21.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2,3-Dimethylbutane	ND	U	ug/m³ Air	2.58	26.3	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Methyl tert-Butyl Ether	ND	U	ug/m³ Air	2.95	26.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Isohexane	**5.75**	J	ug/m³ Air	2.87	26.3	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Vinyl acetate	ND	U	ug/m³ Air	5.15	26.3	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
cis/trans-4-Methyl-2-pentene	ND	U	ug/m³ Air	3.03	51.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Butyraldehyde	ND	U	ug/m³ Air	2.54	22.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2-Butanone (MEK)	ND	U	ug/m³ Air	2.93	22.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Chloroprene	ND	U	ug/m³ Air	2.69	27.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
3-Methylpentane	**3.42**	J	ug/m³ Air	3.08	26.3	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2-Methyl-1-pentene	ND	U	ug/m³ Air	3.33	25.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1-Hexene	ND	U	ug/m³ Air	2.40	25.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
cis-1,2-Dichloroethene	ND	U	ug/m³ Air	2.68	29.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Bromochloromethane	ND	U	ug/m³ Air	5.21	39.5	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2-Ethyl-1-butene	ND	U	ug/m³ Air	6.42	25.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Hexane	**5.79**	J	ug/m³ Air	2.88	26.3	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Chloroform	**79.6**		ug/m³ Air	3.01	36.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
cis-3-Hexene	ND	U	ug/m³ Air	6.62	25.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
trans-2-Hexene	ND	U	ug/m³ Air	2.33	25.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2-Methyl-2-pentene	ND	U	ug/m³ Air	1.72	25.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
cis-3-Methyl-2-pentene	ND	U	ug/m³ Air	1.80	25.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
cis-2-Hexene	ND	U	ug/m³ Air	2.54	25.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Methylcyclopentane	ND	U	ug/m³ Air	2.52	25.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,2-Dichloroethane	ND	U	ug/m³ Air	2.10	30.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2,4-Dimethylpentane	ND	U	ug/m³ Air	2.80	30.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,1,1-Trichloroethane	ND	U	ug/m³ Air	3.95	40.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1-Methylcyclopentene	ND	U	ug/m³ Air	0.614	25.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Benzene	ND	U	ug/m³ Air	2.49	23.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Carbon tetrachloride	ND	U	ug/m³ Air	12.8	46.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
n-Butanol	ND	U	ug/m³ Air	5.64	22.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-04 (MW10-6 WELL A - Air) - cont. **Sampled: 04/25/13 10:38**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Cyclohexane	ND	U	ug/m³ Air	3.18	25.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Isoheptane	**4.74**	J	ug/m³ Air	2.08	30.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2,3-Dimethylpentane	ND	U	ug/m³ Air	2.52	30.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Cyclohexene	ND	U	ug/m³ Air	6.33	25.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
3-Methylhexane	**4.65**	J	ug/m³ Air	2.64	30.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,2-Dichloropropane	ND	U	ug/m³ Air	2.74	34.5	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Bromodichloromethane	ND	U	ug/m³ Air	11.7	50.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Trichloroethene	ND	U	ug/m³ Air	2.71	40.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,4-Dioxane	ND	U	ug/m³ Air	5.34	26.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1-Heptene	**4.46**	J	ug/m³ Air	3.42	30.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2,2,4-Trimethylpentane	ND	U	ug/m³ Air	3.43	34.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
trans-3-Heptene	ND	U	ug/m³ Air	4.49	30.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Heptane	**18.6**	J	ug/m³ Air	2.51	30.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
cis-3-Heptene	ND	U	ug/m³ Air	5.84	30.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
trans-2-Heptene	ND	U	ug/m³ Air	7.72	30.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-1-pentene	ND	U	ug/m³ Air	8.73	34.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
cis-1,3-Dichloropropene	ND	U	ug/m³ Air	3.57	33.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
4-Methyl-2-pentanone (MIBK)	ND	U	ug/m³ Air	5.81	30.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Methylcyclohexane	**24.5**	J	ug/m³ Air	3.60	30.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-2-pentene	ND	U	ug/m³ Air	3.49	34.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2,5-Dimethylhexane	**3.62**	J	ug/m³ Air	2.49	34.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2,2,3-Trimethylpentane	ND	U	ug/m³ Air	3.85	34.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
trans-1,3-Dichloropropene	ND	U	ug/m³ Air	5.10	33.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,1,2-Trichloroethane	ND	U	ug/m³ Air	4.11	40.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2,3,4-Trimethylpentane	ND	U	ug/m³ Air	2.06	34.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Toluene	**1040**		ug/m³ Air	2.16	28.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2-Hexanone	ND	U	ug/m³ Air	7.79	30.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2-Methylheptane	**466**		ug/m³ Air	3.01	34.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1-Methylcyclohexene	ND	U	ug/m³ Air	7.85	29.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Chlorodibromomethane	ND	U	ug/m³ Air	15.5	63.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
3-Methylheptane	**193**		ug/m³ Air	2.35	34.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Hexanal	ND	U	ug/m³ Air	8.91	30.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,2-Dibromoethane (EDB)	ND	U	ug/m³ Air	5.73	57.3	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
2,2,5-Trimethylhexane	ND	U	ug/m³ Air	2.99	39.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1-Octene	**236**		ug/m³ Air	8.56	34.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
n-Octane	**3140**	RA	ug/m³ Air	65.2	636	680	05/09/13 15:22	GCMSR1	KRW	13E0036
Tetrachloroethene	**25.9**	J	ug/m³ Air	4.23	50.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
cis-2-Octene	**96.9**		ug/m³ Air	8.99	34.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Chlorobenzene	ND	U	ug/m³ Air	2.49	34.3	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Ethylbenzene	**7640**	RA	ug/m³ Air	82.7	591	680	05/09/13 15:22	GCMSR1	KRW	13E0036

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-04 (MW10-6 WELL A - Air) - cont. **Sampled: 04/25/13 10:38**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
m-Xylene & p-Xylene	**20700**	RA	ug/m³ Air	181	1180	680	05/09/13 15:22	GCMSR1	KRW	13E0036
Bromoform	ND	U	ug/m³ Air	11.2	77.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Butyl acrylate	ND	U	ug/m³ Air	17.5	39.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Heptanal	ND	U	ug/m³ Air	10.5	34.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Styrene	**15.1**	J	ug/m³ Air	8.50	31.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,1,2,2-Tetrachloroethane	ND	U	ug/m³ Air	16.6	51.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
o-Xylene	**8260**	RA	ug/m³ Air	91.0	591	680	05/09/13 15:22	GCMSR1	KRW	13E0036
Xylenes, total	**28900**	RA	ug/m³ Air	270	1770	680	05/09/13 15:22	GCMSR1	KRW	13E0036
1-Nonene	**498**		ug/m³ Air	5.60	38.5	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
4-Nonene	ND	U	ug/m³ Air	31.8	77.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
n-Nonane	**4500**	RA	ug/m³ Air	102	714	680	05/09/13 15:22	GCMSR1	KRW	13E0036
Isopropylbenzene	**1540**		ug/m³ Air	4.73	36.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Benzaldehyde	ND	U	ug/m³ Air	8.13	32.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
alpha-Pinene	**13000**	RA	ug/m³ Air	94.7	758	680	05/09/13 15:22	GCMSR1	KRW	13E0036
2 & 3-Chlorotoluene	ND	U	ug/m³ Air	20.7	77.2	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
4-Chlorotoluene	ND	U	ug/m³ Air	10.4	38.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
n-Propylbenzene	**590**		ug/m³ Air	7.39	36.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
3-Ethyltoluene	**6790**	RA	ug/m³ Air	123	669	680	05/09/13 15:22	GCMSR1	KRW	13E0036
4-Ethyltoluene	**3910**	RA	ug/m³ Air	144	669	680	05/09/13 15:22	GCMSR1	KRW	13E0036
1,3,5-Trimethylbenzene	**6470**	RA	ug/m³ Air	110	669	680	05/09/13 15:22	GCMSR1	KRW	13E0036
2-Ethyltoluene	**1270**		ug/m³ Air	5.81	36.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
beta-Pinene	**510**		ug/m³ Air	13.4	41.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,2,4-Trimethylbenzene	**10700**	RA	ug/m³ Air	123	669	680	05/09/13 15:22	GCMSR1	KRW	13E0036
tert-Butylbenzene	ND	U	ug/m³ Air	3.22	41.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1-Decene	ND	U	ug/m³ Air	10.5	42.8	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Benzyl chloride	ND	U	ug/m³ Air	10.6	38.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,3-Dichlorobenzene	ND	U	ug/m³ Air	11.8	44.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
n-Decane	**2960**	RA	ug/m³ Air	135	792	680	05/09/13 15:22	GCMSR1	KRW	13E0036
1,4-Dichlorobenzene	ND	U	ug/m³ Air	9.58	44.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Isobutylbenzene	**57.7**		ug/m³ Air	6.65	40.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,2,3-Trimethylbenzene	**2140**	RA	ug/m³ Air	94.0	669	680	05/09/13 15:22	GCMSR1	KRW	13E0036
4-Isopropyltoluene	**2020**		ug/m³ Air	14.0	41.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,2-Dichlorobenzene	ND	U	ug/m³ Air	14.9	44.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Limonene	**716**		ug/m³ Air	5.17	41.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Indan	**14400**	RA	ug/m³ Air	150	658	680	05/09/13 15:22	GCMSR1	KRW	13E0036
Indene	**3640**	RA	ug/m³ Air	92.5	647	680	05/09/13 15:22	GCMSR1	KRW	13E0036
1,3-Diethylbenzene	**456**		ug/m³ Air	10.0	40.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,4-Diethylbenzene	**209**		ug/m³ Air	10.2	40.9	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
n-Butylbenzene	ND	U	ug/m³ Air	2.91	41.0	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1-Undecene	ND	U	ug/m³ Air	6.47	47.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-04 (MW10-6 WELL A - Air) - cont. **Sampled: 04/25/13 10:38**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
n-Undecane	**1440**		ug/m³ Air	5.99	47.7	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,2,4-Trichlorobenzene	ND	U	ug/m³ Air	6.42	55.4	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Naphthalene	**29100**	RA,B	ug/m³ Air	150	713	680	05/09/13 15:22	GCMSR1	KRW	13E0036
Hexachlorobutadiene	ND	U	ug/m³ Air	12.3	79.6	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
1,2-Dichloroethene, Total	ND	U	ug/m³ Air	6.36	59.1	37.3	05/06/13 19:51	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*91 %*						05/06/13 19:51	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*105 %*	*RA*					05/04/13 01:55	VMSC	KRW	13E0020
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*87 %*	*RA*					05/09/13 15:22	GCMSR1	KRW	13E0036
Surr: Fluorobenzene (46-118%)	*74 %*						05/06/13 19:51	GCMSR1	KRW	13E0024
Surr: Fluorobenzene (46-118%)	*97 %*	*RA*					05/04/13 01:55	VMSC	KRW	13E0020
Surr: Fluorobenzene (46-118%)	*73 %*	*RA*					05/09/13 15:22	GCMSR1	KRW	13E0036
Surr: Toluene-d8 (70-136%)	*90 %*						05/06/13 19:51	GCMSR1	KRW	13E0024
Surr: Toluene-d8 (70-136%)	*83 %*	*RA*					05/04/13 01:55	VMSC	KRW	13E0020
Surr: Toluene-d8 (70-136%)	*96 %*	*RA*					05/09/13 15:22	GCMSR1	KRW	13E0036
Surr: 1,4-Dichlorobutane (38-135%)	*112 %*						05/06/13 19:51	GCMSR1	KRW	13E0024
Surr: 1,4-Dichlorobutane (38-135%)	*115 %*	*RA*					05/04/13 01:55	VMSC	KRW	13E0020
Surr: 1,4-Dichlorobutane (38-135%)	*84 %*	*RA*					05/09/13 15:22	GCMSR1	KRW	13E0036
Surr: 4-Bromofluorobenzene (51-128%)	*117 %*						05/06/13 19:51	GCMSR1	KRW	13E0024
Surr: 4-Bromofluorobenzene (51-128%)	*126 %*	*RA*					05/04/13 01:55	VMSC	KRW	13E0020
Surr: 4-Bromofluorobenzene (51-128%)	*97 %*	*RA*					05/09/13 15:22	GCMSR1	KRW	13E0036

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AWD0187-05 (MW10-6 WELL B - Air)								**Sampled: 04/25/13 10:38**		
EPA TO15 - Volatile Organic Compounds by GC/MS										
Ethene	**2.10**	RA,J	ug/m³ Air	0.761	8.53	37.2	05/04/13 02:55	VMSC	KRW	13E0020
Acetylene	ND	RA,U	ug/m³ Air	1.13	7.92	37.2	05/04/13 02:55	VMSC	KRW	13E0020
Ethane	**2.43**	RA,J	ug/m³ Air	0.640	9.15	37.2	05/04/13 02:55	VMSC	KRW	13E0020
Halocarbon 134A	ND	U	ug/m³ Air	7.91	31.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Propylene	ND	U	ug/m³ Air	1.76	12.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Chlorodifluoromethane	ND	U	ug/m³ Air	2.30	26.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Propane	ND	U	ug/m³ Air	13.1	13.4	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Dichlorodifluoromethane	ND	U	ug/m³ Air	4.30	36.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Chloromethane	ND	U	ug/m³ Air	1.11	15.4	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Isobutane	ND	U	ug/m³ Air	2.25	17.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ug/m³ Air	19.1	52.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Acetaldehyde	ND	U	ug/m³ Air	2.76	13.4	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Vinyl chloride	ND	U	ug/m³ Air	2.76	19.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1-Butene/Isobutene	ND	U	ug/m³ Air	1.94	17.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,3-Butadiene	ND	U	ug/m³ Air	1.56	16.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Butane	ND	U	ug/m³ Air	1.62	17.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Methanol	**5.89**	J	ug/m³ Air	2.85	9.75	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
trans-2-Butene	ND	U	ug/m³ Air	1.77	17.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Neopentane	ND	U	ug/m³ Air	2.70	21.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Dichlorofluoromethane	ND	U	ug/m³ Air	3.99	31.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Bromomethane	ND	U	ug/m³ Air	4.58	28.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
cis-2-Butene	ND	U	ug/m³ Air	1.49	17.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Chloroethane	ND	U	ug/m³ Air	2.43	19.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Vinyl bromide	ND	U	ug/m³ Air	8.38	32.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
3-Methyl-1-butene	ND	U	ug/m³ Air	2.37	21.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Ethanol	ND	U	ug/m³ Air	3.62	14.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Acetonitrile	ND	U	ug/m³ Air	3.25	12.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Isopentane	ND	U	ug/m³ Air	1.14	21.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Trichlorofluoromethane	ND	U	ug/m³ Air	2.97	41.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1-Pentene	ND	U	ug/m³ Air	1.68	21.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Acetone	**4.54**	J, B	ug/m³ Air	1.31	17.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Isopropyl alcohol	ND	U	ug/m³ Air	1.48	18.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Acrylonitrile	ND	U	ug/m³ Air	2.07	16.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
n-Pentane	ND	U	ug/m³ Air	1.47	21.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Diethyl ether	ND	U	ug/m³ Air	1.79	22.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Isoprene	ND	U	ug/m³ Air	2.39	20.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
trans-2-Pentene	ND	U	ug/m³ Air	2.63	21.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,1-Dichloroethene	ND	U	ug/m³ Air	1.77	29.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
cis-2-Pentene	ND	U	ug/m³ Air	3.26	21.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Methylene chloride	ND	U	ug/m³ Air	2.36	25.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-05 (MW10-6 WELL B - Air) - cont. **Sampled: 04/25/13 10:38**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
2-Methyl-2-butene	ND	U	ug/m³ Air	4.04	21.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Carbon disulfide	ND	U	ug/m³ Air	5.20	23.2	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Allyl chloride	ND	U	ug/m³ Air	3.55	23.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,1,2-Trichlorotrifluoroethane	ND	U	ug/m³ Air	7.49	57.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2,2-Dimethylbutane	ND	U	ug/m³ Air	3.03	26.2	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Cyclopentene	ND	U	ug/m³ Air	2.64	20.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
trans-1,2-Dichloroethene	ND	U	ug/m³ Air	3.79	29.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
4-Methyl-1-pentene	ND	U	ug/m³ Air	2.45	25.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Propanol	ND	U	ug/m³ Air	5.19	18.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,1-Dichloroethane	ND	U	ug/m³ Air	2.98	30.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Cyclopentane	ND	U	ug/m³ Air	2.46	21.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2,3-Dimethylbutane	ND	U	ug/m³ Air	2.57	26.2	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Methyl tert-Butyl Ether	ND	U	ug/m³ Air	2.94	26.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Isohexane	**5.40**	J	ug/m³ Air	2.86	26.2	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Vinyl acetate	ND	U	ug/m³ Air	5.13	26.2	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
cis/trans-4-Methyl-2-pentene	ND	U	ug/m³ Air	3.02	51.2	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Butyraldehyde	ND	U	ug/m³ Air	2.53	21.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2-Butanone (MEK)	ND	U	ug/m³ Air	2.92	21.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Chloroprene	ND	U	ug/m³ Air	2.68	26.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
3-Methylpentane	**3.17**	J	ug/m³ Air	3.07	26.2	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2-Methyl-1-pentene	ND	U	ug/m³ Air	3.32	25.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1-Hexene	ND	U	ug/m³ Air	2.39	25.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
cis-1,2-Dichloroethene	ND	U	ug/m³ Air	2.67	29.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Bromochloromethane	ND	U	ug/m³ Air	5.19	39.4	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2-Ethyl-1-butene	ND	U	ug/m³ Air	6.40	25.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Hexane	**5.94**	J	ug/m³ Air	2.87	26.2	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Chloroform	**73.2**		ug/m³ Air	3.00	36.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
cis-3-Hexene	ND	U	ug/m³ Air	6.59	25.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
trans-2-Hexene	ND	U	ug/m³ Air	2.32	25.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2-Methyl-2-pentene	ND	U	ug/m³ Air	1.72	25.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
cis-3-Methyl-2-pentene	ND	U	ug/m³ Air	1.79	25.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
cis-2-Hexene	ND	U	ug/m³ Air	2.54	25.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Methylcyclopentane	ND	U	ug/m³ Air	2.51	25.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,2-Dichloroethane	ND	U	ug/m³ Air	2.09	30.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2,4-Dimethylpentane	ND	U	ug/m³ Air	2.79	30.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,1,1-Trichloroethane	ND	U	ug/m³ Air	3.94	40.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1-Methylcyclopentene	ND	U	ug/m³ Air	0.612	25.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Benzene	ND	U	ug/m³ Air	2.48	23.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Carbon tetrachloride	ND	U	ug/m³ Air	12.7	46.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
n-Butanol	ND	U	ug/m³ Air	5.62	22.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-05 (MW10-6 WELL B - Air) - cont. **Sampled: 04/25/13 10:38**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Cyclohexane	ND	U	ug/m³ Air	3.17	25.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Isoheptane	**3.89**	J	ug/m³ Air	2.07	30.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2,3-Dimethylpentane	ND	U	ug/m³ Air	2.51	30.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Cyclohexene	ND	U	ug/m³ Air	6.31	25.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
3-Methylhexane	**4.31**	J	ug/m³ Air	2.64	30.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,2-Dichloropropane	ND	U	ug/m³ Air	2.73	34.4	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Bromodichloromethane	ND	U	ug/m³ Air	11.7	49.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Trichloroethene	ND	U	ug/m³ Air	2.70	40.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,4-Dioxane	ND	U	ug/m³ Air	5.32	26.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1-Heptene	**3.79**	J	ug/m³ Air	3.41	29.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2,2,4-Trimethylpentane	ND	U	ug/m³ Air	3.42	34.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
trans-3-Heptene	ND	U	ug/m³ Air	4.48	29.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Heptane	**18.0**	J	ug/m³ Air	2.50	30.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
cis-3-Heptene	ND	U	ug/m³ Air	5.82	29.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
trans-2-Heptene	ND	U	ug/m³ Air	7.69	29.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-1-pentene	ND	U	ug/m³ Air	8.70	34.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
cis-1,3-Dichloropropene	ND	U	ug/m³ Air	3.56	33.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
4-Methyl-2-pentanone (MIBK)	ND	U	ug/m³ Air	5.79	30.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Methylcyclohexane	**21.7**	J	ug/m³ Air	3.58	29.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-2-pentene	ND	U	ug/m³ Air	3.48	34.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2,5-Dimethylhexane	**2.78**	J	ug/m³ Air	2.48	34.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2,2,3-Trimethylpentane	ND	U	ug/m³ Air	3.84	34.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
trans-1,3-Dichloropropene	ND	U	ug/m³ Air	5.08	33.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,1,2-Trichloroethane	ND	U	ug/m³ Air	4.10	40.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2,3,4-Trimethylpentane	ND	U	ug/m³ Air	2.05	34.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Toluene	**903**		ug/m³ Air	2.16	28.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2-Hexanone	ND	U	ug/m³ Air	7.77	30.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2-Methylheptane	**347**		ug/m³ Air	3.00	34.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1-Methylcyclohexene	ND	U	ug/m³ Air	7.83	29.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Chlorodibromomethane	ND	U	ug/m³ Air	15.5	63.4	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
3-Methylheptane	**157**		ug/m³ Air	2.34	34.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Hexanal	ND	U	ug/m³ Air	8.88	30.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,2-Dibromoethane (EDB)	ND	U	ug/m³ Air	5.71	57.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
2,2,5-Trimethylhexane	ND	U	ug/m³ Air	2.99	39.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1-Octene	**188**		ug/m³ Air	8.53	34.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
n-Octane	**2770**	RA	ug/m³ Air	61.0	595	636	05/09/13 16:19	GCMSR1	KRW	13E0036
Tetrachloroethene	**22.5**	J	ug/m³ Air	4.21	50.4	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
cis-2-Octene	**78.7**		ug/m³ Air	8.96	34.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Chlorobenzene	ND	U	ug/m³ Air	2.48	34.2	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Ethylbenzene	**6850**	RA	ug/m³ Air	77.4	553	636	05/09/13 16:19	GCMSR1	KRW	13E0036

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Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-05 (MW10-6 WELL B - Air) - cont. **Sampled: 04/25/13 10:38**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
m-Xylene & p-Xylene	**18200**	RA	ug/m³ Air	170	1110	636	05/09/13 16:19	GCMSR1	KRW	13E0036
Bromoform	ND	U	ug/m³ Air	11.2	76.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Butyl acrylate	ND	U	ug/m³ Air	17.5	39.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Heptanal	ND	U	ug/m³ Air	10.5	34.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Styrene	**13.3**	J	ug/m³ Air	8.47	31.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,1,2,2-Tetrachloroethane	ND	U	ug/m³ Air	16.5	51.1	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
o-Xylene	**7230**	RA	ug/m³ Air	85.1	553	636	05/09/13 16:19	GCMSR1	KRW	13E0036
Xylenes, total	**25400**	RA	ug/m³ Air	253	1660	636	05/09/13 16:19	GCMSR1	KRW	13E0036
1-Nonene	**587**		ug/m³ Air	5.59	38.4	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
4-Nonene	ND	U	ug/m³ Air	31.7	76.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
n-Nonane	**3820**	RA	ug/m³ Air	95.2	668	636	05/09/13 16:19	GCMSR1	KRW	13E0036
Isopropylbenzene	**1240**		ug/m³ Air	4.72	36.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Benzaldehyde	ND	U	ug/m³ Air	8.10	32.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
alpha-Pinene	**11200**	RA	ug/m³ Air	88.6	709	636	05/09/13 16:19	GCMSR1	KRW	13E0036
2 & 3-Chlorotoluene	ND	U	ug/m³ Air	20.6	77.0	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
4-Chlorotoluene	ND	U	ug/m³ Air	10.4	38.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
n-Propylbenzene	**461**		ug/m³ Air	7.37	36.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
3-Ethyltoluene	**5820**	RA	ug/m³ Air	115	626	636	05/09/13 16:19	GCMSR1	KRW	13E0036
4-Ethyltoluene	**3370**	RA	ug/m³ Air	135	626	636	05/09/13 16:19	GCMSR1	KRW	13E0036
1,3,5-Trimethylbenzene	**5530**	RA	ug/m³ Air	103	626	636	05/09/13 16:19	GCMSR1	KRW	13E0036
2-Ethyltoluene	**998**		ug/m³ Air	5.79	36.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
beta-Pinene	**455**		ug/m³ Air	13.3	41.4	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,2,4-Trimethylbenzene	**9270**	RA	ug/m³ Air	115	626	636	05/09/13 16:19	GCMSR1	KRW	13E0036
tert-Butylbenzene	ND	U	ug/m³ Air	3.20	40.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1-Decene	ND	U	ug/m³ Air	10.5	42.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Benzyl chloride	ND	U	ug/m³ Air	10.6	38.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,3-Dichlorobenzene	ND	U	ug/m³ Air	11.7	44.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
n-Decane	**2080**		ug/m³ Air	7.40	43.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,4-Dichlorobenzene	ND	U	ug/m³ Air	9.55	44.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Isobutylbenzene	**41.0**		ug/m³ Air	6.63	40.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,2,3-Trimethylbenzene	**1590**		ug/m³ Air	5.14	36.6	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
4-Isopropyltoluene	**1580**		ug/m³ Air	14.0	40.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,2-Dichlorobenzene	ND	U	ug/m³ Air	14.9	44.7	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Limonene	**519**		ug/m³ Air	5.16	41.4	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Indan	**12300**	RA	ug/m³ Air	140	615	636	05/09/13 16:19	GCMSR1	KRW	13E0036
Indene	**3260**	RA	ug/m³ Air	86.5	605	636	05/09/13 16:19	GCMSR1	KRW	13E0036
1,3-Diethylbenzene	**347**		ug/m³ Air	9.98	40.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,4-Diethylbenzene	**152**		ug/m³ Air	10.2	40.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
n-Butylbenzene	ND	U	ug/m³ Air	2.90	40.8	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1-Undecene	ND	U	ug/m³ Air	6.45	46.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-05 (MW10-6 WELL B - Air) - cont. **Sampled: 04/25/13 10:38**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
n-Undecane	**1080**		ug/m³ Air	5.97	47.5	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,2,4-Trichlorobenzene	ND	U	ug/m³ Air	6.40	55.2	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Naphthalene	**20500**	RA,B	ug/m³ Air	140	667	636	05/09/13 16:19	GCMSR1	KRW	13E0036
Hexachlorobutadiene	ND	U	ug/m³ Air	12.3	79.3	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
1,2-Dichloroethene, Total	ND	U	ug/m³ Air	6.34	58.9	37.2	05/06/13 20:48	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*94 %*						05/06/13 20:48	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*104 %*	*RA*					05/04/13 02:55	VMSC	KRW	13E0020
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*88 %*	*RA*					05/09/13 16:19	GCMSR1	KRW	13E0036
Surr: Fluorobenzene (46-118%)	*78 %*						05/06/13 20:48	GCMSR1	KRW	13E0024
Surr: Fluorobenzene (46-118%)	*108 %*	*RA*					05/04/13 02:55	VMSC	KRW	13E0020
Surr: Fluorobenzene (46-118%)	*77 %*	*RA*					05/09/13 16:19	GCMSR1	KRW	13E0036
Surr: Toluene-d8 (70-136%)	*92 %*						05/06/13 20:48	GCMSR1	KRW	13E0024
Surr: Toluene-d8 (70-136%)	*88 %*	*RA*					05/04/13 02:55	VMSC	KRW	13E0020
Surr: Toluene-d8 (70-136%)	*98 %*	*RA*					05/09/13 16:19	GCMSR1	KRW	13E0036
Surr: 1,4-Dichlorobutane (38-135%)	*111 %*						05/06/13 20:48	GCMSR1	KRW	13E0024
Surr: 1,4-Dichlorobutane (38-135%)	*105 %*	*RA*					05/04/13 02:55	VMSC	KRW	13E0020
Surr: 1,4-Dichlorobutane (38-135%)	*90 %*	*RA*					05/09/13 16:19	GCMSR1	KRW	13E0036
Surr: 4-Bromofluorobenzene (51-128%)	*114 %*						05/06/13 20:48	GCMSR1	KRW	13E0024
Surr: 4-Bromofluorobenzene (51-128%)	*114 %*	*RA*					05/04/13 02:55	VMSC	KRW	13E0020
Surr: 4-Bromofluorobenzene (51-128%)	*99 %*	*RA*					05/09/13 16:19	GCMSR1	KRW	13E0036

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: AWD0187-06 (MW10-15 WELL - Air)								**Sampled: 04/25/13 14:13**		
EPA TO15 - Volatile Organic Compounds by GC/MS										
Ethene	**1.01**	RA,J	ug/m³ Air	0.115	1.29	5.62	05/04/13 00:56	VMSC	KRW	13E0020
Acetylene	ND	RA,U	ug/m³ Air	0.170	1.20	5.62	05/04/13 00:56	VMSC	KRW	13E0020
Ethane	**1.01**	RA,J	ug/m³ Air	0.0967	1.38	5.62	05/04/13 00:56	VMSC	KRW	13E0020
Halocarbon 134A	**23.2**		ug/m³ Air	1.20	4.69	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Propylene	ND	U	ug/m³ Air	0.266	1.93	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Chlorodifluoromethane	ND	U	ug/m³ Air	0.348	3.97	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Propane	ND	U	ug/m³ Air	1.99	2.03	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Dichlorodifluoromethane	**2.84**	J	ug/m³ Air	0.650	5.56	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Chloromethane	**0.258**	J	ug/m³ Air	0.167	2.32	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Isobutane	ND	U	ug/m³ Air	0.339	2.67	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ug/m³ Air	2.89	7.86	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Acetaldehyde	**2.90**		ug/m³ Air	0.417	2.02	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Vinyl chloride	ND	U	ug/m³ Air	0.417	2.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1-Butene/Isobutene	**7.53**		ug/m³ Air	0.293	2.58	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,3-Butadiene	ND	U	ug/m³ Air	0.236	2.49	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Butane	**0.458**	J	ug/m³ Air	0.244	2.67	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Methanol	**17.2**		ug/m³ Air	0.431	1.47	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
trans-2-Butene	ND	U	ug/m³ Air	0.268	2.58	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Neopentane	ND	U	ug/m³ Air	0.408	3.32	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Dichlorofluoromethane	ND	U	ug/m³ Air	0.603	4.73	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Bromomethane	ND	U	ug/m³ Air	0.692	4.36	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
cis-2-Butene	ND	U	ug/m³ Air	0.226	2.58	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Chloroethane	ND	U	ug/m³ Air	0.368	2.97	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Vinyl bromide	ND	U	ug/m³ Air	1.27	4.92	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
3-Methyl-1-butene	ND	U	ug/m³ Air	0.358	3.22	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Ethanol	**2.15**		ug/m³ Air	0.546	2.12	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Acetonitrile	ND	U	ug/m³ Air	0.491	1.89	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Isopentane	ND	U	ug/m³ Air	0.172	3.32	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Trichlorofluoromethane	**1.22**	J	ug/m³ Air	0.448	6.31	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1-Pentene	ND	U	ug/m³ Air	0.255	3.22	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Acetone	**4.40**	B	ug/m³ Air	0.198	2.67	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Isopropyl alcohol	**1.62**	J	ug/m³ Air	0.224	2.76	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Acrylonitrile	ND	U	ug/m³ Air	0.312	2.44	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
n-Pentane	**0.584**	J	ug/m³ Air	0.222	3.32	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Diethyl ether	ND	U	ug/m³ Air	0.271	3.41	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Isoprene	ND	U	ug/m³ Air	0.362	3.13	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
trans-2-Pentene	ND	U	ug/m³ Air	0.398	3.22	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,1-Dichloroethene	ND	U	ug/m³ Air	0.267	4.46	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
cis-2-Pentene	ND	U	ug/m³ Air	0.493	3.22	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Methylene chloride	ND	U	ug/m³ Air	0.357	3.90	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-06 (MW10-15 WELL - Air) - cont. **Sampled: 04/25/13 14:13**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
2-Methyl-2-butene	ND	U	ug/m³ Air	0.611	3.22	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Carbon disulfide	ND	U	ug/m³ Air	0.786	3.50	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Allyl chloride	ND	U	ug/m³ Air	0.536	3.52	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,1,2-Trichlorotrifluoroethane	ND	U	ug/m³ Air	1.13	8.61	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2,2-Dimethylbutane	ND	U	ug/m³ Air	0.458	3.96	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Cyclopentene	ND	U	ug/m³ Air	0.399	3.13	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
trans-1,2-Dichloroethene	ND	U	ug/m³ Air	0.573	4.46	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
4-Methyl-1-pentene	ND	U	ug/m³ Air	0.370	3.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Propanol	**4.01**		ug/m³ Air	0.784	2.76	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,1-Dichloroethane	ND	U	ug/m³ Air	0.450	4.55	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Cyclopentane	ND	U	ug/m³ Air	0.372	3.22	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2,3-Dimethylbutane	ND	U	ug/m³ Air	0.388	3.96	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Methyl tert-Butyl Ether	ND	U	ug/m³ Air	0.444	4.05	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Isohexane	ND	U	ug/m³ Air	0.432	3.96	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Vinyl acetate	ND	U	ug/m³ Air	0.776	3.96	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
cis/trans-4-Methyl-2-pentene	ND	U	ug/m³ Air	0.457	7.74	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Butyraldehyde	ND	U	ug/m³ Air	0.383	3.31	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2-Butanone (MEK)	**1.36**	J	ug/m³ Air	0.441	3.31	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Chloroprene	ND	U	ug/m³ Air	0.405	4.07	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
3-Methylpentane	ND	U	ug/m³ Air	0.464	3.96	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2-Methyl-1-pentene	ND	U	ug/m³ Air	0.501	3.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1-Hexene	ND	U	ug/m³ Air	0.362	3.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
cis-1,2-Dichloroethene	ND	U	ug/m³ Air	0.403	4.46	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Bromochloromethane	ND	U	ug/m³ Air	0.785	5.95	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2-Ethyl-1-butene	ND	U	ug/m³ Air	0.968	3.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Hexane	ND	U	ug/m³ Air	0.434	3.96	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Chloroform	**20.7**		ug/m³ Air	0.453	5.49	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
cis-3-Hexene	ND	U	ug/m³ Air	0.997	3.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
trans-2-Hexene	ND	U	ug/m³ Air	0.350	3.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2-Methyl-2-pentene	ND	U	ug/m³ Air	0.259	3.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
cis-3-Methyl-2-pentene	ND	U	ug/m³ Air	0.271	3.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
cis-2-Hexene	ND	U	ug/m³ Air	0.383	3.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Methylcyclopentane	ND	U	ug/m³ Air	0.379	3.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,2-Dichloroethane	ND	U	ug/m³ Air	0.316	4.55	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2,4-Dimethylpentane	ND	U	ug/m³ Air	0.421	4.61	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,1,1-Trichloroethane	ND	U	ug/m³ Air	0.595	6.13	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1-Methylcyclopentene	ND	U	ug/m³ Air	0.0925	3.78	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Benzene	ND	U	ug/m³ Air	0.375	3.59	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Carbon tetrachloride	ND	U	ug/m³ Air	1.92	7.07	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
n-Butanol	ND	U	ug/m³ Air	0.850	3.41	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-06 (MW10-15 WELL - Air) - cont. **Sampled: 04/25/13 14:13**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Cyclohexane	ND	U	ug/m³ Air	0.480	3.87	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Isoheptane	ND	U	ug/m³ Air	0.313	4.61	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2,3-Dimethylpentane	ND	U	ug/m³ Air	0.380	4.61	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Cyclohexene	ND	U	ug/m³ Air	0.953	3.78	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
3-Methylhexane	**0.412**	J	ug/m³ Air	0.398	4.61	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,2-Dichloropropane	ND	U	ug/m³ Air	0.413	5.19	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Bromodichloromethane	ND	U	ug/m³ Air	1.77	7.53	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Trichloroethene	ND	U	ug/m³ Air	0.408	6.04	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,4-Dioxane	ND	U	ug/m³ Air	0.804	4.05	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1-Heptene	ND	U	ug/m³ Air	0.515	4.51	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2,2,4-Trimethylpentane	ND	U	ug/m³ Air	0.517	5.25	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
trans-3-Heptene	ND	U	ug/m³ Air	0.677	4.51	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Heptane	ND	U	ug/m³ Air	0.378	4.61	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
cis-3-Heptene	ND	U	ug/m³ Air	0.880	4.51	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
trans-2-Heptene	ND	U	ug/m³ Air	1.16	4.51	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-1-pentene	ND	U	ug/m³ Air	1.32	5.16	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
cis-1,3-Dichloropropene	ND	U	ug/m³ Air	0.538	5.10	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
4-Methyl-2-pentanone (MIBK)	ND	U	ug/m³ Air	0.875	4.60	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Methylcyclohexane	ND	U	ug/m³ Air	0.542	4.51	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-2-pentene	ND	U	ug/m³ Air	0.526	5.16	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2,5-Dimethylhexane	ND	U	ug/m³ Air	0.375	5.25	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2,2,3-Trimethylpentane	ND	U	ug/m³ Air	0.580	5.25	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
trans-1,3-Dichloropropene	ND	U	ug/m³ Air	0.768	5.10	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,1,2-Trichloroethane	ND	U	ug/m³ Air	0.619	6.13	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2,3,4-Trimethylpentane	ND	U	ug/m³ Air	0.310	5.25	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Toluene	**5.98**		ug/m³ Air	0.326	4.24	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2-Hexanone	ND	U	ug/m³ Air	1.17	4.60	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2-Methylheptane	ND	U	ug/m³ Air	0.454	5.25	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1-Methylcyclohexene	ND	U	ug/m³ Air	1.18	4.42	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Chlorodibromomethane	ND	U	ug/m³ Air	2.34	9.57	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
3-Methylheptane	ND	U	ug/m³ Air	0.354	5.25	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Hexanal	**2.75**	J	ug/m³ Air	1.34	4.61	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,2-Dibromoethane (EDB)	ND	U	ug/m³ Air	0.863	8.63	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2,2,5-Trimethylhexane	ND	U	ug/m³ Air	0.451	5.90	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1-Octene	ND	U	ug/m³ Air	1.29	5.16	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
n-Octane	ND	U	ug/m³ Air	0.538	5.25	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Tetrachloroethene	ND	U	ug/m³ Air	0.636	7.62	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
cis-2-Octene	ND	U	ug/m³ Air	1.35	5.16	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Chlorobenzene	ND	U	ug/m³ Air	0.375	5.17	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Ethylbenzene	**1.08**	J	ug/m³ Air	0.683	4.88	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-06 (MW10-15 WELL - Air) - cont. **Sampled: 04/25/13 14:13**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
m-Xylene & p-Xylene	**4.97**	J	ug/m³ Air	1.50	9.76	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Bromoform	ND	U	ug/m³ Air	1.69	11.6	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Butyl acrylate	ND	U	ug/m³ Air	2.64	5.89	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Heptanal	ND	U	ug/m³ Air	1.58	5.25	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Styrene	ND	U	ug/m³ Air	1.28	4.79	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,1,2,2-Tetrachloroethane	ND	U	ug/m³ Air	2.50	7.72	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
o-Xylene	**2.87**	J	ug/m³ Air	0.751	4.88	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Xylenes, total	**7.84**	J	ug/m³ Air	2.23	14.6	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1-Nonene	ND	U	ug/m³ Air	0.844	5.80	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
4-Nonene	ND	U	ug/m³ Air	4.79	11.6	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
n-Nonane	**1.15**	J	ug/m³ Air	0.840	5.90	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Isopropylbenzene	ND	U	ug/m³ Air	0.713	5.52	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Benzaldehyde	ND	U	ug/m³ Air	1.22	4.88	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
alpha-Pinene	ND	U	ug/m³ Air	0.783	6.26	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2 & 3-Chlorotoluene	ND	U	ug/m³ Air	3.11	11.6	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
4-Chlorotoluene	ND	U	ug/m³ Air	1.57	5.82	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
n-Propylbenzene	ND	U	ug/m³ Air	1.11	5.52	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
3-Ethyltoluene	**2.63**	J	ug/m³ Air	1.01	5.52	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
4-Ethyltoluene	**1.44**	J	ug/m³ Air	1.19	5.52	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,3,5-Trimethylbenzene	**1.47**	J	ug/m³ Air	0.909	5.52	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
2-Ethyltoluene	**0.975**	J	ug/m³ Air	0.876	5.52	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
beta-Pinene	ND	U	ug/m³ Air	2.01	6.26	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,2,4-Trimethylbenzene	**6.55**		ug/m³ Air	1.02	5.52	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
tert-Butylbenzene	ND	U	ug/m³ Air	0.484	6.17	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1-Decene	ND	U	ug/m³ Air	1.58	6.45	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Benzyl chloride	ND	U	ug/m³ Air	1.60	5.82	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,3-Dichlorobenzene	ND	U	ug/m³ Air	1.77	6.76	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
n-Decane	**7.35**		ug/m³ Air	1.12	6.54	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,4-Dichlorobenzene	ND	U	ug/m³ Air	1.44	6.76	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Isobutylbenzene	ND	U	ug/m³ Air	1.00	6.17	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,2,3-Trimethylbenzene	**1.87**	J	ug/m³ Air	0.776	5.52	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
4-Isopropyltoluene	ND	U	ug/m³ Air	2.11	6.17	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,2-Dichlorobenzene	ND	U	ug/m³ Air	2.25	6.76	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Limonene	ND	U	ug/m³ Air	0.779	6.26	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Indan	**1.62**	J	ug/m³ Air	1.24	5.43	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Indene	ND	U	ug/m³ Air	0.764	5.34	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,3-Diethylbenzene	ND	U	ug/m³ Air	1.51	6.17	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,4-Diethylbenzene	ND	U	ug/m³ Air	1.54	6.17	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
n-Butylbenzene	ND	U	ug/m³ Air	0.438	6.17	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1-Undecene	ND	U	ug/m³ Air	0.975	7.09	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024

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Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

ANALYTICAL REPORT

Sample ID: AWD0187-06 (MW10-15 WELL - Air) - cont. **Sampled: 04/25/13 14:13**

EPA TO15 - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
n-Undecane	**3.07**	J	ug/m³ Air	0.902	7.18	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,2,4-Trichlorobenzene	ND	U	ug/m³ Air	0.967	8.34	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Naphthalene	**2.14**	J	ug/m³ Air	1.24	5.89	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Hexachlorobutadiene	ND	U	ug/m³ Air	1.86	12.0	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
1,2-Dichloroethene, Total	ND	U	ug/m³ Air	0.958	8.91	5.62	05/06/13 17:55	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*89 %*						05/06/13 17:55	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*98 %*	*RA*					05/04/13 00:56	VMSC	KRW	13E0020
Surr: Fluorobenzene (46-118%)	*71 %*						05/06/13 17:55	GCMSR1	KRW	13E0024
Surr: Fluorobenzene (46-118%)	*97 %*	*RA*					05/04/13 00:56	VMSC	KRW	13E0020
Surr: Toluene-d8 (70-136%)	*93 %*						05/06/13 17:55	GCMSR1	KRW	13E0024
Surr: Toluene-d8 (70-136%)	*88 %*	*RA*					05/04/13 00:56	VMSC	KRW	13E0020
Surr: 1,4-Dichlorobutane (38-135%)	*97 %*						05/06/13 17:55	GCMSR1	KRW	13E0024
Surr: 1,4-Dichlorobutane (38-135%)	*92 %*	*RA*					05/04/13 00:56	VMSC	KRW	13E0020
Surr: 4-Bromofluorobenzene (51-128%)	*89 %*						05/06/13 17:55	GCMSR1	KRW	13E0024
Surr: 4-Bromofluorobenzene (51-128%)	*92 %*	*RA*					05/04/13 00:56	VMSC	KRW	13E0020

Golder Associates Ltd.
500-4260 Still Creek Drive
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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Blank

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 13E0020-BLK1 (Blank - Air)										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Ethene	ND	U	ug/m³ Air	0.0409	0.459	2.00	05/03/13 16:34	VMSC	KRW	13E0020
Acetylene	ND	U	ug/m³ Air	0.0606	0.426	2.00	05/03/13 16:34	VMSC	KRW	13E0020
Ethane	ND	U	ug/m³ Air	0.0344	0.492	2.00	05/03/13 16:34	VMSC	KRW	13E0020
Benzene	ND	U	ug/m³ Air	0.0716	1.28	2.00	05/03/13 16:34	VMSC	KRW	13E0020
Toluene	ND	U	ug/m³ Air	0.112	1.51	2.00	05/03/13 16:34	VMSC	KRW	13E0020
Ethylbenzene	ND	U	ug/m³ Air	0.129	1.74	2.00	05/03/13 16:34	VMSC	KRW	13E0020
m-Xylene & p-Xylene	ND	U	ug/m³ Air	0.258	3.47	2.00	05/03/13 16:34	VMSC	KRW	13E0020
o-Xylene	ND	U	ug/m³ Air	0.129	1.74	2.00	05/03/13 16:34	VMSC	KRW	13E0020
Xylenes, total	ND	U	ug/m³ Air	0.191	5.21	2.00	05/03/13 16:34	VMSC	KRW	13E0020
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*97%*						05/03/13 16:34	VMSC	KRW	13E0020
Surr: Fluorobenzene (46-118%)	*91%*						05/03/13 16:34	VMSC	KRW	13E0020
Surr: Toluene-d8 (70-136%)	*95%*						05/03/13 16:34	VMSC	KRW	13E0020
Surr: 1,4-Dichlorobutane (38-135%)	*88%*						05/03/13 16:34	VMSC	KRW	13E0020
Surr: 4-Bromofluorobenzene (51-128%)	*93%*						05/03/13 16:34	VMSC	KRW	13E0020
Sample ID: 13E0024-BLK1 (Blank - Air)										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Halocarbon 134A	ND	U	ug/m³ Air	0.426	1.67	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Propylene	ND	U	ug/m³ Air	0.0947	0.688	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Chlorodifluoromethane	ND	U	ug/m³ Air	0.124	1.41	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Propane	ND	U	ug/m³ Air	0.707	0.721	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Dichlorodifluoromethane	ND	U	ug/m³ Air	0.231	1.98	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Chloromethane	ND	U	ug/m³ Air	0.0595	0.826	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Isobutane	ND	U	ug/m³ Air	0.121	0.951	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ug/m³ Air	1.03	2.80	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Acetaldehyde	ND	U	ug/m³ Air	0.148	0.721	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Vinyl chloride	ND	U	ug/m³ Air	0.148	1.02	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1-Butene/Isobutene	ND	U	ug/m³ Air	0.104	0.918	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,3-Butadiene	ND	U	ug/m³ Air	0.0841	0.885	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Butane	ND	U	ug/m³ Air	0.0870	0.951	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Methanol	ND	U	ug/m³ Air	0.153	0.524	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
trans-2-Butene	ND	U	ug/m³ Air	0.0955	0.918	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Neopentane	ND	U	ug/m³ Air	0.145	1.18	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Dichlorofluoromethane	ND	U	ug/m³ Air	0.215	1.68	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024

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Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 13E0024-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Bromomethane	ND	U	ug/m³ Air	0.246	1.55	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
cis-2-Butene	ND	U	ug/m³ Air	0.0803	0.918	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Chloroethane	ND	U	ug/m³ Air	0.131	1.06	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Vinyl bromide	ND	U	ug/m³ Air	0.451	1.75	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
3-Methyl-1-butene	ND	U	ug/m³ Air	0.127	1.15	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Ethanol	ND	U	ug/m³ Air	0.194	0.754	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Acetonitrile	ND	U	ug/m³ Air	0.175	0.672	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Isopentane	ND	U	ug/m³ Air	0.0614	1.18	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Trichlorofluoromethane	ND	U	ug/m³ Air	0.160	2.25	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1-Pentene	ND	U	ug/m³ Air	0.0906	1.15	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Acetone	**0.126**	**J**	ug/m³ Air	0.0703	0.950	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Isopropyl alcohol	ND	U	ug/m³ Air	0.0796	0.983	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Acrylonitrile	ND	U	ug/m³ Air	0.111	0.868	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
n-Pentane	ND	U	ug/m³ Air	0.0791	1.18	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Diethyl ether	ND	U	ug/m³ Air	0.0964	1.21	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Isoprene	ND	U	ug/m³ Air	0.129	1.11	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
trans-2-Pentene	ND	U	ug/m³ Air	0.142	1.15	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,1-Dichloroethene	ND	U	ug/m³ Air	0.0952	1.59	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
cis-2-Pentene	ND	U	ug/m³ Air	0.175	1.15	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Methylene chloride	ND	U	ug/m³ Air	0.127	1.39	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2-Methyl-2-butene	ND	U	ug/m³ Air	0.217	1.15	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Carbon disulfide	ND	U	ug/m³ Air	0.280	1.25	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Allyl chloride	ND	U	ug/m³ Air	0.191	1.25	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,1,2-Trichlorotrifluoroethane	ND	U	ug/m³ Air	0.403	3.07	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2,2-Dimethylbutane	ND	U	ug/m³ Air	0.163	1.41	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Cyclopentene	ND	U	ug/m³ Air	0.142	1.11	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
trans-1,2-Dichloroethene	ND	U	ug/m³ Air	0.204	1.59	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
4-Methyl-1-pentene	ND	U	ug/m³ Air	0.132	1.38	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Propanol	ND	U	ug/m³ Air	0.279	0.983	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,1-Dichloroethane	ND	U	ug/m³ Air	0.160	1.62	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Cyclopentane	ND	U	ug/m³ Air	0.132	1.15	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2,3-Dimethylbutane	ND	U	ug/m³ Air	0.138	1.41	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Methyl tert-Butyl Ether	ND	U	ug/m³ Air	0.158	1.44	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Isohexane	ND	U	ug/m³ Air	0.154	1.41	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Vinyl acetate	ND	U	ug/m³ Air	0.276	1.41	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
cis/trans-4-Methyl-2-pentene	ND	U	ug/m³ Air	0.163	2.76	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024

Golder Associates Ltd.
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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
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Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 13E0024-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Butyraldehyde	ND	U	ug/m³ Air	0.136	1.18	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2-Butanone (MEK)	ND	U	ug/m³ Air	0.157	1.18	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Chloroprene	ND	U	ug/m³ Air	0.144	1.45	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
3-Methylpentane	ND	U	ug/m³ Air	0.165	1.41	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2-Methyl-1-pentene	ND	U	ug/m³ Air	0.178	1.38	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1-Hexene	ND	U	ug/m³ Air	0.129	1.38	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
cis-1,2-Dichloroethene	ND	U	ug/m³ Air	0.144	1.59	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Bromochloromethane	ND	U	ug/m³ Air	0.279	2.12	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2-Ethyl-1-butene	ND	U	ug/m³ Air	0.344	1.38	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Hexane	ND	U	ug/m³ Air	0.154	1.41	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Chloroform	ND	U	ug/m³ Air	0.161	1.95	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
cis-3-Hexene	ND	U	ug/m³ Air	0.355	1.38	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
trans-2-Hexene	ND	U	ug/m³ Air	0.125	1.38	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2-Methyl-2-pentene	ND	U	ug/m³ Air	0.0923	1.38	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
cis-3-Methyl-2-pentene	ND	U	ug/m³ Air	0.0964	1.38	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
cis-2-Hexene	ND	U	ug/m³ Air	0.136	1.38	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Methylcyclopentane	ND	U	ug/m³ Air	0.135	1.38	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,2-Dichloroethane	ND	U	ug/m³ Air	0.113	1.62	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2,4-Dimethylpentane	ND	U	ug/m³ Air	0.150	1.64	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,1,1-Trichloroethane	ND	U	ug/m³ Air	0.212	2.18	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1-Methylcyclopentene	ND	U	ug/m³ Air	0.0329	1.34	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Benzene	ND	U	ug/m³ Air	0.134	1.28	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Carbon tetrachloride	ND	U	ug/m³ Air	0.684	2.52	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
n-Butanol	ND	U	ug/m³ Air	0.302	1.21	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Cyclohexane	ND	U	ug/m³ Air	0.171	1.38	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Isoheptane	ND	U	ug/m³ Air	0.111	1.64	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2,3-Dimethylpentane	ND	U	ug/m³ Air	0.135	1.64	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Cyclohexene	ND	U	ug/m³ Air	0.339	1.34	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
3-Methylhexane	ND	U	ug/m³ Air	0.142	1.64	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,2-Dichloropropane	ND	U	ug/m³ Air	0.147	1.85	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Bromodichloromethane	ND	U	ug/m³ Air	0.629	2.68	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Trichloroethene	ND	U	ug/m³ Air	0.145	2.15	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,4-Dioxane	ND	U	ug/m³ Air	0.286	1.44	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1-Heptene	ND	U	ug/m³ Air	0.183	1.61	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2,2,4-Trimethylpentane	ND	U	ug/m³ Air	0.184	1.87	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
trans-3-Heptene	ND	U	ug/m³ Air	0.241	1.61	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 13E0024-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Heptane	ND	U	ug/m³ Air	0.134	1.64	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
cis-3-Heptene	ND	U	ug/m³ Air	0.313	1.61	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
trans-2-Heptene	ND	U	ug/m³ Air	0.414	1.61	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-1-pentene	ND	U	ug/m³ Air	0.468	1.84	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
cis-1,3-Dichloropropene	ND	U	ug/m³ Air	0.192	1.82	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
4-Methyl-2-pentanone (MIBK)	ND	U	ug/m³ Air	0.311	1.64	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Methylcyclohexane	ND	U	ug/m³ Air	0.193	1.61	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2,4,4-Trimethyl-2-pentene	ND	U	ug/m³ Air	0.187	1.84	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2,5-Dimethylhexane	ND	U	ug/m³ Air	0.134	1.87	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2,2,3-Trimethylpentane	ND	U	ug/m³ Air	0.206	1.87	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
trans-1,3-Dichloropropene	ND	U	ug/m³ Air	0.273	1.82	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,1,2-Trichloroethane	ND	U	ug/m³ Air	0.220	2.18	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2,3,4-Trimethylpentane	ND	U	ug/m³ Air	0.110	1.87	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Toluene	ND	U	ug/m³ Air	0.116	1.51	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2-Hexanone	ND	U	ug/m³ Air	0.418	1.64	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2-Methylheptane	ND	U	ug/m³ Air	0.162	1.87	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1-Methylcyclohexene	ND	U	ug/m³ Air	0.421	1.57	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Chlorodibromomethane	ND	U	ug/m³ Air	0.833	3.41	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
3-Methylheptane	ND	U	ug/m³ Air	0.126	1.87	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Hexanal	ND	U	ug/m³ Air	0.478	1.64	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,2-Dibromoethane (EDB)	ND	U	ug/m³ Air	0.307	3.07	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2,2,5-Trimethylhexane	ND	U	ug/m³ Air	0.161	2.10	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1-Octene	ND	U	ug/m³ Air	0.459	1.84	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
n-Octane	ND	U	ug/m³ Air	0.192	1.87	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Tetrachloroethene	ND	U	ug/m³ Air	0.227	2.71	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
cis-2-Octene	ND	U	ug/m³ Air	0.482	1.84	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Chlorobenzene	ND	U	ug/m³ Air	0.134	1.84	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Ethylbenzene	ND	U	ug/m³ Air	0.243	1.74	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
m-Xylene & p-Xylene	ND	U	ug/m³ Air	0.533	3.47	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Bromoform	ND	U	ug/m³ Air	0.602	4.13	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Butyl acrylate	ND	U	ug/m³ Air	0.941	2.10	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Heptanal	ND	U	ug/m³ Air	0.562	1.87	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Styrene	ND	U	ug/m³ Air	0.456	1.70	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,1,2,2-Tetrachloroethane	ND	U	ug/m³ Air	0.888	2.75	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
o-Xylene	ND	U	ug/m³ Air	0.267	1.74	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Xylenes, total	ND	U	ug/m³ Air	0.795	5.21	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 13E0024-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
1-Nonene	ND	U	ug/m³ Air	0.300	2.06	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
4-Nonene	ND	U	ug/m³ Air	1.71	2.06	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
n-Nonane	ND	U	ug/m³ Air	0.299	2.10	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Isopropylbenzene	ND	U	ug/m³ Air	0.254	1.97	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Benzaldehyde	ND	U	ug/m³ Air	0.436	1.74	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
alpha-Pinene	ND	U	ug/m³ Air	0.279	2.23	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2 & 3-Chlorotoluene	ND	U	ug/m³ Air	1.11	4.14	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
4-Chlorotoluene	ND	U	ug/m³ Air	0.559	2.07	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
n-Propylbenzene	ND	U	ug/m³ Air	0.396	1.97	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
3-Ethyltoluene	ND	U	ug/m³ Air	0.361	1.97	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
4-Ethyltoluene	ND	U	ug/m³ Air	0.423	1.97	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,3,5-Trimethylbenzene	ND	U	ug/m³ Air	0.323	1.97	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
2-Ethyltoluene	ND	U	ug/m³ Air	0.312	1.97	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
beta-Pinene	ND	U	ug/m³ Air	0.716	2.23	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,2,4-Trimethylbenzene	ND	U	ug/m³ Air	0.363	1.97	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
tert-Butylbenzene	ND	U	ug/m³ Air	0.172	2.20	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1-Decene	ND	U	ug/m³ Air	0.562	2.30	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Benzyl chloride	ND	U	ug/m³ Air	0.569	2.07	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,3-Dichlorobenzene	ND	U	ug/m³ Air	0.630	2.40	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
n-Decane	ND	U	ug/m³ Air	0.398	2.33	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,4-Dichlorobenzene	ND	U	ug/m³ Air	0.513	2.40	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Isobutylbenzene	ND	U	ug/m³ Air	0.357	2.20	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,2,3-Trimethylbenzene	ND	U	ug/m³ Air	0.276	1.97	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
4-Isopropyltoluene	ND	U	ug/m³ Air	0.751	2.20	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,2-Dichlorobenzene	ND	U	ug/m³ Air	0.801	2.40	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Limonene	ND	U	ug/m³ Air	0.277	2.23	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Indan	ND	U	ug/m³ Air	0.441	1.93	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Indene	ND	U	ug/m³ Air	0.272	1.90	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,3-Diethylbenzene	ND	U	ug/m³ Air	0.537	2.20	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,4-Diethylbenzene	ND	U	ug/m³ Air	0.548	2.20	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
n-Butylbenzene	ND	U	ug/m³ Air	0.156	2.20	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1-Undecene	ND	U	ug/m³ Air	0.347	2.52	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
n-Undecane	ND	U	ug/m³ Air	0.321	2.56	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
1,2,4-Trichlorobenzene	**0.689**	**J**	ug/m³ Air	0.344	2.97	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Naphthalene	ND	U	ug/m³ Air	0.440	2.10	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Hexachlorobutadiene	ND	U	ug/m³ Air	0.661	4.27	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 13E0024-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
1,2-Dichloroethene, Total	ND	U	ug/m³ Air	0.341	3.17	2.00	05/06/13 12:02	GCMSR1	KRW	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*92%*						05/06/13 12:02	GCMSR1	KRW	13E0024
Surr: Fluorobenzene (46-118%)	*83%*						05/06/13 12:02	GCMSR1	KRW	13E0024
Surr: Toluene-d8 (70-136%)	*103%*						05/06/13 12:02	GCMSR1	KRW	13E0024
Surr: 1,4-Dichlorobutane (38-135%)	*96%*						05/06/13 12:02	GCMSR1	KRW	13E0024
Surr: 4-Bromofluorobenzene (51-128%)	*92%*						05/06/13 12:02	GCMSR1	KRW	13E0024
Sample ID: 13E0036-BLK1 (Blank - Air)										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Halocarbon 134A	ND	U	ug/m³ Air	0.426	1.67	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Propylene	ND	U	ug/m³ Air	0.0947	0.688	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Chlorodifluoromethane	ND	U	ug/m³ Air	0.124	1.41	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Propane	ND	U	ug/m³ Air	0.707	0.721	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Dichlorodifluoromethane	ND	U	ug/m³ Air	0.231	1.98	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Chloromethane	ND	U	ug/m³ Air	0.0595	0.826	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Isobutane	ND	U	ug/m³ Air	0.121	0.951	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ug/m³ Air	1.03	2.80	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Acetaldehyde	**0.326**	**J**	ug/m³ Air	0.148	0.721	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Vinyl chloride	ND	U	ug/m³ Air	0.148	1.02	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1-Butene/Isobutene	ND	U	ug/m³ Air	0.104	0.918	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,3-Butadiene	ND	U	ug/m³ Air	0.0841	0.885	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Butane	ND	U	ug/m³ Air	0.0870	0.951	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Methanol	**0.188**	**J**	ug/m³ Air	0.153	0.524	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
trans-2-Butene	ND	U	ug/m³ Air	0.0955	0.918	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Neopentane	ND	U	ug/m³ Air	0.145	1.18	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Dichlorofluoromethane	ND	U	ug/m³ Air	0.215	1.68	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Bromomethane	ND	U	ug/m³ Air	0.246	1.55	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
cis-2-Butene	ND	U	ug/m³ Air	0.0803	0.918	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Chloroethane	ND	U	ug/m³ Air	0.131	1.06	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Vinyl bromide	ND	U	ug/m³ Air	0.451	1.75	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
3-Methyl-1-butene	ND	U	ug/m³ Air	0.127	1.15	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Ethanol	ND	U	ug/m³ Air	0.194	0.754	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Acetonitrile	ND	U	ug/m³ Air	0.175	0.672	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Isopentane	ND	U	ug/m³ Air	0.0614	1.18	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 13E0036-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
Trichlorofluoromethane	ND	U	ug/m³ Air	0.160	2.25	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1-Pentene	ND	U	ug/m³ Air	0.0906	1.15	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Acetone	**0.134**	**J**	ug/m³ Air	0.0703	0.950	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Isopropyl alcohol	ND	U	ug/m³ Air	0.0796	0.983	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Acrylonitrile	ND	U	ug/m³ Air	0.111	0.868	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
n-Pentane	ND	U	ug/m³ Air	0.0791	1.18	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Diethyl ether	ND	U	ug/m³ Air	0.0964	1.21	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Isoprene	ND	U	ug/m³ Air	0.129	1.11	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
trans-2-Pentene	ND	U	ug/m³ Air	0.142	1.15	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,1-Dichloroethene	ND	U	ug/m³ Air	0.0952	1.59	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
cis-2-Pentene	ND	U	ug/m³ Air	0.175	1.15	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Methylene chloride	ND	U	ug/m³ Air	0.127	1.39	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2-Methyl-2-butene	ND	U	ug/m³ Air	0.217	1.15	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Carbon disulfide	ND	U	ug/m³ Air	0.280	1.25	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Allyl chloride	ND	U	ug/m³ Air	0.191	1.25	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,1,2-Trichlorotrifluoroethane	ND	U	ug/m³ Air	0.403	3.07	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2,2-Dimethylbutane	ND	U	ug/m³ Air	0.163	1.41	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Cyclopentene	ND	U	ug/m³ Air	0.142	1.11	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
trans-1,2-Dichloroethene	ND	U	ug/m³ Air	0.204	1.59	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
4-Methyl-1-pentene	ND	U	ug/m³ Air	0.132	1.38	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Propanol	ND	U	ug/m³ Air	0.279	0.983	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,1-Dichloroethane	ND	U	ug/m³ Air	0.160	1.62	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Cyclopentane	ND	U	ug/m³ Air	0.132	1.15	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2,3-Dimethylbutane	ND	U	ug/m³ Air	0.138	1.41	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Methyl tert-Butyl Ether	ND	U	ug/m³ Air	0.158	1.44	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Isohexane	ND	U	ug/m³ Air	0.154	1.41	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Vinyl acetate	ND	U	ug/m³ Air	0.276	1.41	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
cis/trans-4-Methyl-2-pentene	ND	U	ug/m³ Air	0.163	2.76	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Butyraldehyde	ND	U	ug/m³ Air	0.136	1.18	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2-Butanone (MEK)	ND	U	ug/m³ Air	0.157	1.18	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Chloroprene	ND	U	ug/m³ Air	0.144	1.45	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
3-Methylpentane	ND	U	ug/m³ Air	0.165	1.41	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2-Methyl-1-pentene	ND	U	ug/m³ Air	0.178	1.38	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1-Hexene	ND	U	ug/m³ Air	0.129	1.38	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
cis-1,2-Dichloroethene	ND	U	ug/m³ Air	0.144	1.59	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Bromochloromethane	ND	U	ug/m³ Air	0.279	2.12	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 13E0036-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
2-Ethyl-1-butene	ND	U	ug/m³ Air	0.344	1.38	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Hexane	ND	U	ug/m³ Air	0.154	1.41	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Chloroform	ND	U	ug/m³ Air	0.161	1.95	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
cis-3-Hexene	ND	U	ug/m³ Air	0.355	1.38	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
trans-2-Hexene	ND	U	ug/m³ Air	0.125	1.38	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2-Methyl-2-pentene	ND	U	ug/m³ Air	0.0923	1.38	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
cis-3-Methyl-2-pentene	ND	U	ug/m³ Air	0.0964	1.38	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
cis-2-Hexene	ND	U	ug/m³ Air	0.136	1.38	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Methylcyclopentane	ND	U	ug/m³ Air	0.135	1.38	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,2-Dichloroethane	ND	U	ug/m³ Air	0.113	1.62	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2,4-Dimethylpentane	ND	U	ug/m³ Air	0.150	1.64	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,1,1-Trichloroethane	ND	U	ug/m³ Air	0.212	2.18	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1-Methylcyclopentene	ND	U	ug/m³ Air	0.0329	1.34	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Benzene	ND	U	ug/m³ Air	0.134	1.28	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Carbon tetrachloride	ND	U	ug/m³ Air	0.684	2.52	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
n-Butanol	ND	U	ug/m³ Air	0.302	1.21	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Cyclohexane	ND	U	ug/m³ Air	0.171	1.38	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Isoheptane	ND	U	ug/m³ Air	0.111	1.64	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2,3-Dimethylpentane	ND	U	ug/m³ Air	0.135	1.64	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Cyclohexene	ND	U	ug/m³ Air	0.339	1.34	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
3-Methylhexane	ND	U	ug/m³ Air	0.142	1.64	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,2-Dichloropropane	ND	U	ug/m³ Air	0.147	1.85	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Bromodichloromethane	ND	U	ug/m³ Air	0.629	2.68	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Trichloroethene	ND	U	ug/m³ Air	0.145	2.15	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,4-Dioxane	ND	U	ug/m³ Air	0.286	1.44	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1-Heptene	ND	U	ug/m³ Air	0.183	1.61	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2,2,4-Trimethylpentane	ND	U	ug/m³ Air	0.184	1.87	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
trans-3-Heptene	ND	U	ug/m³ Air	0.241	1.61	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Heptane	ND	U	ug/m³ Air	0.134	1.64	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
cis-3-Heptene	ND	U	ug/m³ Air	0.313	1.61	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
trans-2-Heptene	ND	U	ug/m³ Air	0.414	1.61	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2,4,4-Trimethyl-1-pentene	ND	U	ug/m³ Air	0.468	1.84	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
cis-1,3-Dichloropropene	ND	U	ug/m³ Air	0.192	1.82	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
4-Methyl-2-pentanone (MIBK)	ND	U	ug/m³ Air	0.311	1.64	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Methylcyclohexane	ND	U	ug/m³ Air	0.193	1.61	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2,4,4-Trimethyl-2-pentene	ND	U	ug/m³ Air	0.187	1.84	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 13E0036-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
2,5-Dimethylhexane	ND	U	ug/m³ Air	0.134	1.87	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2,2,3-Trimethylpentane	ND	U	ug/m³ Air	0.206	1.87	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
trans-1,3-Dichloropropene	ND	U	ug/m³ Air	0.273	1.82	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,1,2-Trichloroethane	ND	U	ug/m³ Air	0.220	2.18	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2,3,4-Trimethylpentane	ND	U	ug/m³ Air	0.110	1.87	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Toluene	ND	U	ug/m³ Air	0.116	1.51	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2-Hexanone	ND	U	ug/m³ Air	0.418	1.64	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2-Methylheptane	ND	U	ug/m³ Air	0.162	1.87	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1-Methylcyclohexene	ND	U	ug/m³ Air	0.421	1.57	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Chlorodibromomethane	ND	U	ug/m³ Air	0.833	3.41	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
3-Methylheptane	ND	U	ug/m³ Air	0.126	1.87	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Hexanal	ND	U	ug/m³ Air	0.478	1.64	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,2-Dibromoethane (EDB)	ND	U	ug/m³ Air	0.307	3.07	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2,2,5-Trimethylhexane	ND	U	ug/m³ Air	0.161	2.10	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1-Octene	ND	U	ug/m³ Air	0.459	1.84	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
n-Octane	ND	U	ug/m³ Air	0.192	1.87	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Tetrachloroethene	ND	U	ug/m³ Air	0.227	2.71	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
cis-2-Octene	ND	U	ug/m³ Air	0.482	1.84	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Chlorobenzene	ND	U	ug/m³ Air	0.134	1.84	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Ethylbenzene	ND	U	ug/m³ Air	0.243	1.74	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
m-Xylene & p-Xylene	ND	U	ug/m³ Air	0.533	3.47	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Bromoform	ND	U	ug/m³ Air	0.602	4.13	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Butyl acrylate	ND	U	ug/m³ Air	0.941	2.10	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Heptanal	ND	U	ug/m³ Air	0.562	1.87	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Styrene	ND	U	ug/m³ Air	0.456	1.70	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,1,2,2-Tetrachloroethane	ND	U	ug/m³ Air	0.888	2.75	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
o-Xylene	ND	U	ug/m³ Air	0.267	1.74	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Xylenes, total	ND	U	ug/m³ Air	0.795	5.21	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1-Nonene	ND	U	ug/m³ Air	0.300	2.06	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
4-Nonene	ND	U	ug/m³ Air	1.71	2.06	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
n-Nonane	ND	U	ug/m³ Air	0.299	2.10	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Isopropylbenzene	ND	U	ug/m³ Air	0.254	1.97	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Benzaldehyde	ND	U	ug/m³ Air	0.436	1.74	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
alpha-Pinene	ND	U	ug/m³ Air	0.279	2.23	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2 & 3-Chlorotoluene	ND	U	ug/m³ Air	1.11	4.14	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
4-Chlorotoluene	ND	U	ug/m³ Air	0.559	2.07	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Blank - Cont.

Analyte	Result	Data Qualifier	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: 13E0036-BLK1 (Blank - Air) - cont.										
EPA TO15 - Volatile Organic Compounds by GC/MS										
n-Propylbenzene	ND	**U**	ug/m³ Air	0.396	1.97	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
3-Ethyltoluene	ND	**U**	ug/m³ Air	0.361	1.97	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
4-Ethyltoluene	ND	**U**	ug/m³ Air	0.423	1.97	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,3,5-Trimethylbenzene	ND	**U**	ug/m³ Air	0.323	1.97	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
2-Ethyltoluene	ND	**U**	ug/m³ Air	0.312	1.97	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
beta-Pinene	ND	**U**	ug/m³ Air	0.716	2.23	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,2,4-Trimethylbenzene	ND	**U**	ug/m³ Air	0.363	1.97	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
tert-Butylbenzene	ND	**U**	ug/m³ Air	0.172	2.20	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1-Decene	ND	**U**	ug/m³ Air	0.562	2.30	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Benzyl chloride	ND	**U**	ug/m³ Air	0.569	2.07	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,3-Dichlorobenzene	ND	**U**	ug/m³ Air	0.630	2.40	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
n-Decane	ND	**U**	ug/m³ Air	0.398	2.33	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,4-Dichlorobenzene	ND	**U**	ug/m³ Air	0.513	2.40	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Isobutylbenzene	ND	**U**	ug/m³ Air	0.357	2.20	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,2,3-Trimethylbenzene	ND	**U**	ug/m³ Air	0.276	1.97	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
4-Isopropyltoluene	ND	**U**	ug/m³ Air	0.751	2.20	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,2-Dichlorobenzene	ND	**U**	ug/m³ Air	0.801	2.40	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Limonene	ND	**U**	ug/m³ Air	0.277	2.23	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Indan	ND	**U**	ug/m³ Air	0.441	1.93	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Indene	ND	**U**	ug/m³ Air	0.272	1.90	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,3-Diethylbenzene	ND	**U**	ug/m³ Air	0.537	2.20	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,4-Diethylbenzene	ND	**U**	ug/m³ Air	0.548	2.20	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
n-Butylbenzene	ND	**U**	ug/m³ Air	0.156	2.20	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1-Undecene	ND	**U**	ug/m³ Air	0.347	2.52	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
n-Undecane	ND	**U**	ug/m³ Air	0.321	2.56	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,2,4-Trichlorobenzene	**0.776**	**J**	ug/m³ Air	0.344	2.97	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Naphthalene	**0.551**	**J**	ug/m³ Air	0.440	2.10	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Hexachlorobutadiene	**0.717**	**J**	ug/m³ Air	0.661	4.27	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
1,2-Dichloroethene, Total	ND	**U**	ug/m³ Air	0.341	3.17	2.00	05/09/13 12:32	GCMSR1	KRW	13E0036
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*89%*						05/09/13 12:32	GCMSR1	KRW	13E0036
Surr: Fluorobenzene (46-118%)	*81%*						05/09/13 12:32	GCMSR1	KRW	13E0036
Surr: Toluene-d8 (70-136%)	*105%*						05/09/13 12:32	GCMSR1	KRW	13E0036
Surr: 1,4-Dichlorobutane (38-135%)	*98%*						05/09/13 12:32	GCMSR1	KRW	13E0036
Surr: 4-Bromofluorobenzene (51-128%)	*93%*						05/09/13 12:32	GCMSR1	KRW	13E0036

TestAmerica
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Golder Associates Ltd.	Work Order:	AWD0187	Received: 04/29/13 08:15
500-4260 Still Creek Drive			Reported: 05/16/13 06:57
Burnaby, British Columbia, CANADA V5C6C6	Project:	AENV Canada Creosote	
Julie Burghardt	Project Number:	11-1324-0164	

PROJECT QUALITY CONTROL DATA

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Calibration Check

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0020-CCV1 (Calibration Check - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Ethene	12.7		ug/m³ Air	0.459	2.00	12.8	99%	70 - 130	VMSC	05/03/13 13:12	13E0020
Acetylene	8.11	C4	ug/m³ Air	0.426	2.00	11.9	68%	70 - 130	VMSC	05/03/13 13:12	13E0020
Ethane	13.1		ug/m³ Air	0.492	2.00	13.7	95%	50 - 150	VMSC	05/03/13 13:12	13E0020
Benzene	31.0		ug/m³ Air	1.28	2.00	36.0	86%	70 - 130	VMSC	05/03/13 13:12	13E0020
Toluene	39.8		ug/m³ Air	1.51	2.00	43.2	92%	70 - 130	VMSC	05/03/13 13:12	13E0020
Ethylbenzene	45.3		ug/m³ Air	1.74	2.00	49.3	92%	70 - 130	VMSC	05/03/13 13:12	13E0020
m-Xylene & p-Xylene	92.4		ug/m³ Air	3.47	2.00	96.8	95%	70 - 130	VMSC	05/03/13 13:12	13E0020
o-Xylene	48.2		ug/m³ Air	1.74	2.00	48.9	99%	70 - 130	VMSC	05/03/13 13:12	13E0020
Xylenes, total	141		ug/m³ Air	5.21	2.00	146	96%	70 - 130	VMSC	05/03/13 13:12	13E0020
Surr: 2-Bromo-1,1,1-trifluoroethane (70-130%)	*96%*								VMSC	05/03/13 13:12	13E0020
Surr: Fluorobenzene (70-130%)	*104%*								VMSC	05/03/13 13:12	13E0020
Surr: Toluene-d8 (70-130%)	*108%*								VMSC	05/03/13 13:12	13E0020
Surr: 1,4-Dichlorobutane (70-130%)	*107%*								VMSC	05/03/13 13:12	13E0020
Surr: 4-Bromofluorobenzene (70-130%)	*102%*								VMSC	05/03/13 13:12	13E0020
Sample ID: 13E0024-CCV1 (Calibration Check - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Propylene	19.6		ug/m³ Air	0.688	2.00	18.7	104%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Propane	20.7		ug/m³ Air	0.721	2.00	19.3	108%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Dichlorodifluoromethane	48.8		ug/m³ Air	1.98	2.00	51.2	95%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Chloromethane	23.2		ug/m³ Air	0.826	2.00	21.6	107%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Isobutane	26.4		ug/m³ Air	0.951	2.00	25.4	104%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,2-Dichloro-1,1,2,2-tetrafluoroethane	63.5		ug/m³ Air	2.80	2.00	71.7	89%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Acetaldehyde	16.0		ug/m³ Air	0.721	2.00	19.0	84%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
Vinyl chloride	26.0		ug/m³ Air	1.02	2.00	26.5	98%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1-Butene/Isobutene	25.1		ug/m³ Air	0.918	2.00	24.2	104%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,3-Butadiene	25.6		ug/m³ Air	0.885	2.00	24.3	106%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Butane	26.7		ug/m³ Air	0.951	2.00	25.1	106%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Methanol	14.0		ug/m³ Air	0.524	2.00	14.3	98%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
trans-2-Butene	25.2		ug/m³ Air	0.918	2.00	24.0	105%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Bromomethane	35.4		ug/m³ Air	1.55	2.00	40.2	88%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
cis-2-Butene	27.2		ug/m³ Air	0.918	2.00	25.9	105%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Chloroethane	26.1		ug/m³ Air	1.06	2.00	27.3	95%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Vinyl bromide	41.6		ug/m³ Air	1.75	2.00	47.1	88%	50 - 150	GCMSR1	05/06/13 08:50	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0024-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
3-Methyl-1-butene	32.4		ug/m³ Air	1.15	2.00	33.0	98%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Ethanol	19.4		ug/m³ Air	0.754	2.00	18.9	103%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
Acetonitrile	20.7		ug/m³ Air	0.672	2.00	17.7	117%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
Isopentane	32.5		ug/m³ Air	1.18	2.00	31.8	102%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Trichlorofluoromethane	55.9		ug/m³ Air	2.25	2.00	60.5	92%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1-Pentene	35.2		ug/m³ Air	1.15	2.00	32.4	109%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Acetone	28.9	B	ug/m³ Air	0.950	2.00	26.6	109%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Acrylonitrile	26.7		ug/m³ Air	0.868	2.00	23.6	113%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
n-Pentane	35.5		ug/m³ Air	1.18	2.00	33.0	107%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Isoprene	27.0		ug/m³ Air	1.11	2.00	30.6	88%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
trans-2-Pentene	31.9		ug/m³ Air	1.15	2.00	33.0	97%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,1-Dichloroethene	40.5		ug/m³ Air	1.59	2.00	43.1	94%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
cis-2-Pentene	31.7		ug/m³ Air	1.15	2.00	32.4	98%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Methylene chloride	40.0		ug/m³ Air	1.39	2.00	37.1	108%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
2-Methyl-2-butene	32.6		ug/m³ Air	1.15	2.00	33.3	98%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Carbon disulfide	29.9		ug/m³ Air	1.25	2.00	33.2	90%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
Allyl chloride	39.5		ug/m³ Air	1.25	2.00	34.7	114%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,1,2-Trichlorotrifluoroethane	67.0		ug/m³ Air	3.07	2.00	82.5	81%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
2,2-Dimethylbutane	41.7		ug/m³ Air	1.41	2.00	39.1	107%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Cyclopentene	27.3		ug/m³ Air	1.11	2.00	30.3	90%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
trans-1,2-Dichloroethene	42.2		ug/m³ Air	1.59	2.00	43.1	98%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
4-Methyl-1-pentene	43.1		ug/m³ Air	1.38	2.00	38.5	112%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,1-Dichloroethane	42.2		ug/m³ Air	1.62	2.00	44.9	94%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Cyclopentane	32.7		ug/m³ Air	1.15	2.00	31.8	103%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
2,3-Dimethylbutane	39.8		ug/m³ Air	1.41	2.00	38.7	103%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Methyl tert-Butyl Ether	34.1		ug/m³ Air	1.44	2.00	38.5	89%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Isohexane	41.9		ug/m³ Air	1.41	2.00	39.8	105%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Vinyl acetate	46.8		ug/m³ Air	1.41	2.00	40.5	115%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
2-Butanone (MEK)	34.3		ug/m³ Air	1.18	2.00	33.0	104%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
Chloroprene	36.8		ug/m³ Air	1.45	2.00	38.2	96%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
3-Methylpentane	37.2		ug/m³ Air	1.41	2.00	39.8	93%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
2-Methyl-1-pentene	33.9		ug/m³ Air	1.38	2.00	38.2	89%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1-Hexene	40.3		ug/m³ Air	1.38	2.00	36.4	111%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
cis-1,2-Dichloroethene	40.3		ug/m³ Air	1.59	2.00	43.5	93%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Bromochloromethane	46.8		ug/m³ Air	2.12	2.00	56.5	83%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Hexane	37.6		ug/m³ Air	1.41	2.00	40.6	93%	70 - 130	GCMSR1	05/06/13 08:50	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0024-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Chloroform	48.3		ug/m³ Air	1.95	2.00	53.1	91%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
trans-2-Hexene	37.2		ug/m³ Air	1.38	2.00	39.3	95%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
cis-2-Hexene	34.0		ug/m³ Air	1.38	2.00	36.4	93%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Methylcyclopentane	34.6		ug/m³ Air	1.38	2.00	37.8	91%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,2-Dichloroethane	44.7		ug/m³ Air	1.62	2.00	44.9	99%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
2,4-Dimethylpentane	47.7		ug/m³ Air	1.64	2.00	45.9	104%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,1,1-Trichloroethane	57.0		ug/m³ Air	2.18	2.00	60.5	94%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Benzene	37.2		ug/m³ Air	1.28	2.00	35.8	104%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Carbon tetrachloride	**90.5**	**C8**	**ug/m³ Air**	**2.52**	**2.00**	**69.1**	**131%**	**70 - 130**	**GCMSR1**	**05/06/13 08:50**	**13E0024**
n-Butanol	41.2		ug/m³ Air	1.21	2.00	33.9	122%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
Cyclohexane	43.4		ug/m³ Air	1.38	2.00	39.6	110%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Isoheptane	55.3		ug/m³ Air	1.64	2.00	45.5	122%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
2,3-Dimethylpentane	51.6		ug/m³ Air	1.64	2.00	45.5	114%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
3-Methylhexane	55.2		ug/m³ Air	1.64	2.00	45.5	122%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,2-Dichloropropane	59.3		ug/m³ Air	1.85	2.00	51.3	116%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Bromodichloromethane	80.6		ug/m³ Air	2.68	2.00	70.8	114%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Trichloroethene	54.2		ug/m³ Air	2.15	2.00	56.8	96%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,4-Dioxane	45.0		ug/m³ Air	1.44	2.00	40.0	113%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
2,2,4-Trimethylpentane	59.1		ug/m³ Air	1.87	2.00	51.8	114%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Heptane	47.3		ug/m³ Air	1.64	2.00	45.9	103%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
cis-1,3-Dichloropropene	52.9		ug/m³ Air	1.82	2.00	49.4	107%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
4-Methyl-2-pentanone (MIBK)	58.7		ug/m³ Air	1.64	2.00	44.1	133%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
Methylcyclohexane	46.2		ug/m³ Air	1.61	2.00	44.9	103%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
trans-1,3-Dichloropropene	59.0		ug/m³ Air	1.82	2.00	52.2	113%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,1,2-Trichloroethane	65.8		ug/m³ Air	2.18	2.00	61.1	108%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
2,3,4-Trimethylpentane	63.5		ug/m³ Air	1.87	2.00	52.8	120%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Toluene	44.8		ug/m³ Air	1.51	2.00	43.0	104%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
2-Methylheptane	65.4		ug/m³ Air	1.87	2.00	52.3	125%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Chlorodibromomethane	109		ug/m³ Air	3.41	2.00	92.7	117%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
3-Methylheptane	53.0		ug/m³ Air	1.87	2.00	52.3	101%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,2-Dibromoethane (EDB)	92.1		ug/m³ Air	3.07	2.00	86.8	106%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
n-Octane	65.5		ug/m³ Air	1.87	2.00	52.3	125%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Tetrachloroethene	73.3		ug/m³ Air	2.71	2.00	75.2	97%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Chlorobenzene	54.6		ug/m³ Air	1.84	2.00	52.0	105%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Ethylbenzene	53.3		ug/m³ Air	1.74	2.00	49.1	109%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
m-Xylene & p-Xylene	108		ug/m³ Air	3.47	2.00	96.3	112%	70 - 130	GCMSR1	05/06/13 08:50	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0024-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Bromoform	143		ug/m³ Air	4.13	2.00	115	125%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Styrene	51.8		ug/m³ Air	1.70	2.00	48.6	107%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,1,2,2-Tetrachloroethane	93.6		ug/m³ Air	2.75	2.00	76.8	122%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
o-Xylene	54.2		ug/m³ Air	1.74	2.00	48.6	112%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Xylenes, total	162		ug/m³ Air	5.21	2.00	145	112%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
n-Nonane	**77.0**	**C8**	**ug/m³ Air**	**2.10**	**2.00**	**57.6**	**134%**	**70 - 130**	**GCMSR1**	**05/06/13 08:50**	**13E0024**
Isopropylbenzene	57.6		ug/m³ Air	1.97	2.00	52.5	110%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
alpha-Pinene	63.1		ug/m³ Air	2.23	2.00	61.2	103%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
n-Propylbenzene	61.3		ug/m³ Air	1.97	2.00	52.9	116%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
3-Ethyltoluene	57.2		ug/m³ Air	1.97	2.00	51.4	111%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
4-Ethyltoluene	59.7		ug/m³ Air	1.97	2.00	51.9	115%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,3,5-Trimethylbenzene	61.4		ug/m³ Air	1.97	2.00	56.0	110%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
2-Ethyltoluene	56.0		ug/m³ Air	1.97	2.00	50.9	110%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
beta-Pinene	48.0		ug/m³ Air	2.23	2.00	46.6	103%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,2,4-Trimethylbenzene	62.9		ug/m³ Air	1.97	2.00	56.0	112%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Benzyl chloride	**97.7**	**C8**	**ug/m³ Air**	**2.07**	**2.00**	**59.0**	**166%**	**70 - 130**	**GCMSR1**	**05/06/13 08:50**	**13E0024**
1,3-Dichlorobenzene	78.1		ug/m³ Air	2.40	2.00	68.5	114%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
n-Decane	81.4		ug/m³ Air	2.33	2.00	65.1	125%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,4-Dichlorobenzene	77.8		ug/m³ Air	2.40	2.00	67.9	115%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,2,3-Trimethylbenzene	55.3		ug/m³ Air	1.97	2.00	50.4	110%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,2-Dichlorobenzene	76.4		ug/m³ Air	2.40	2.00	67.9	112%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Limonene	70.2		ug/m³ Air	2.23	2.00	61.2	115%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
Indan	62.8		ug/m³ Air	1.93	2.00	53.1	118%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
Indene	59.5		ug/m³ Air	1.90	2.00	51.7	115%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
1,3-Diethylbenzene	60.8		ug/m³ Air	2.20	2.00	55.7	109%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
1,4-Diethylbenzene	61.0		ug/m³ Air	2.20	2.00	56.9	107%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
n-Undecane	84.4		ug/m³ Air	2.56	2.00	66.2	127%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
1,2,4-Trichlorobenzene	101	B	ug/m³ Air	2.97	2.00	84.6	119%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
Naphthalene	70.8		ug/m³ Air	2.10	2.00	54.8	129%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
Hexachlorobutadiene	133		ug/m³ Air	4.27	2.00	121	110%	50 - 150	GCMSR1	05/06/13 08:50	13E0024
1,2-Dichloroethene, Total	82.5		ug/m³ Air	3.17	2.00	86.6	95%	70 - 130	GCMSR1	05/06/13 08:50	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (70-130%)	*93%*								GCMSR1	05/06/13 8:50	13E0024
Surr: Fluorobenzene (70-130%)	*89%*								GCMSR1	05/06/13 8:50	13E0024
Surr: Toluene-d8 (70-130%)	*103%*								GCMSR1	05/06/13 8:50	13E0024
Surr: 1,4-Dichlorobutane (70-130%)	*110%*								GCMSR1	05/06/13 8:50	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0024-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Surr: 4-Bromofluorobenzene (70-130%)	*107%*								GCMSR1	05/06/13 8:50	13E0024
Sample ID: 13E0036-CCV1 (Calibration Check - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Propylene	19.5		ug/m³ Air	0.688	2.00	18.7	104%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Propane	20.8		ug/m³ Air	0.721	2.00	19.3	108%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Dichlorodifluoromethane	48.4		ug/m³ Air	1.98	2.00	51.2	94%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Chloromethane	23.0		ug/m³ Air	0.826	2.00	21.6	106%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Isobutane	26.3		ug/m³ Air	0.951	2.00	25.4	104%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,2-Dichloro-1,1,2,2-tetrafluoroethane	63.0		ug/m³ Air	2.80	2.00	71.7	88%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Acetaldehyde	16.7	B	ug/m³ Air	0.721	2.00	19.0	88%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
Vinyl chloride	25.7		ug/m³ Air	1.02	2.00	26.5	97%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1-Butene/Isobutene	25.2		ug/m³ Air	0.918	2.00	24.2	104%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,3-Butadiene	25.6		ug/m³ Air	0.885	2.00	24.3	105%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Butane	26.6		ug/m³ Air	0.951	2.00	25.1	106%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Methanol	14.1	B	ug/m³ Air	0.524	2.00	14.3	99%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
trans-2-Butene	25.5		ug/m³ Air	0.918	2.00	24.0	106%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Bromomethane	34.6		ug/m³ Air	1.55	2.00	40.2	86%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
cis-2-Butene	27.6		ug/m³ Air	0.918	2.00	25.9	106%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Chloroethane	25.6		ug/m³ Air	1.06	2.00	27.3	94%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Vinyl bromide	40.8		ug/m³ Air	1.75	2.00	47.1	87%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
3-Methyl-1-butene	32.5		ug/m³ Air	1.15	2.00	33.0	98%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Ethanol	18.8		ug/m³ Air	0.754	2.00	18.9	100%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
Acetonitrile	21.4		ug/m³ Air	0.672	2.00	17.7	121%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
Isopentane	32.7		ug/m³ Air	1.18	2.00	31.8	103%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Trichlorofluoromethane	55.4		ug/m³ Air	2.25	2.00	60.5	91%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1-Pentene	35.9		ug/m³ Air	1.15	2.00	32.4	111%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Acetone	30.6	B	ug/m³ Air	0.950	2.00	26.6	115%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Acrylonitrile	28.0		ug/m³ Air	0.868	2.00	23.6	119%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
n-Pentane	35.7		ug/m³ Air	1.18	2.00	33.0	108%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Isoprene	26.9		ug/m³ Air	1.11	2.00	30.6	88%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
trans-2-Pentene	32.0		ug/m³ Air	1.15	2.00	33.0	97%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,1-Dichloroethene	40.5		ug/m³ Air	1.59	2.00	43.1	94%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
cis-2-Pentene	31.7		ug/m³ Air	1.15	2.00	32.4	98%	70 - 130	GCMSR1	05/09/13 09:36	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0036-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Methylene chloride	40.1		ug/m³ Air	1.39	2.00	37.1	108%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
2-Methyl-2-butene	33.0		ug/m³ Air	1.15	2.00	33.3	99%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Carbon disulfide	29.3		ug/m³ Air	1.25	2.00	33.2	88%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
Allyl chloride	39.1		ug/m³ Air	1.25	2.00	34.7	113%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,1,2-Trichlorotrifluoroethane	65.8		ug/m³ Air	3.07	2.00	82.5	80%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
2,2-Dimethylbutane	41.9		ug/m³ Air	1.41	2.00	39.1	107%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Cyclopentene	26.8		ug/m³ Air	1.11	2.00	30.3	89%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
trans-1,2-Dichloroethene	42.0		ug/m³ Air	1.59	2.00	43.1	97%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
4-Methyl-1-pentene	44.4		ug/m³ Air	1.38	2.00	38.5	115%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,1-Dichloroethane	42.0		ug/m³ Air	1.62	2.00	44.9	94%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Cyclopentane	32.9		ug/m³ Air	1.15	2.00	31.8	103%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
2,3-Dimethylbutane	39.8		ug/m³ Air	1.41	2.00	38.7	103%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Methyl tert-Butyl Ether	34.9		ug/m³ Air	1.44	2.00	38.5	91%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Isohexane	41.9		ug/m³ Air	1.41	2.00	39.8	105%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Vinyl acetate	48.8		ug/m³ Air	1.41	2.00	40.5	121%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
2-Butanone (MEK)	36.1		ug/m³ Air	1.18	2.00	33.0	109%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
Chloroprene	37.0		ug/m³ Air	1.45	2.00	38.2	97%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
3-Methylpentane	36.8		ug/m³ Air	1.41	2.00	39.8	92%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
2-Methyl-1-pentene	34.1		ug/m³ Air	1.38	2.00	38.2	89%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1-Hexene	40.3		ug/m³ Air	1.38	2.00	36.4	111%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
cis-1,2-Dichloroethene	40.1		ug/m³ Air	1.59	2.00	43.5	92%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Bromochloromethane	46.5		ug/m³ Air	2.12	2.00	56.5	82%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Hexane	37.3		ug/m³ Air	1.41	2.00	40.6	92%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Chloroform	48.0		ug/m³ Air	1.95	2.00	53.1	90%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
trans-2-Hexene	37.3		ug/m³ Air	1.38	2.00	39.3	95%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
cis-2-Hexene	34.0		ug/m³ Air	1.38	2.00	36.4	93%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Methylcyclopentane	34.4		ug/m³ Air	1.38	2.00	37.8	91%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,2-Dichloroethane	45.5		ug/m³ Air	1.62	2.00	44.9	101%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
2,4-Dimethylpentane	47.8		ug/m³ Air	1.64	2.00	45.9	104%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,1,1-Trichloroethane	56.7		ug/m³ Air	2.18	2.00	60.5	94%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Benzene	39.0		ug/m³ Air	1.28	2.00	35.8	109%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Carbon tetrachloride	**96.2**	**C8**	**ug/m³ Air**	**2.52**	**2.00**	**69.1**	**139%**	**70 - 130**	**GCMSR1**	**05/09/13 09:36**	**13E0036**
n-Butanol	36.9		ug/m³ Air	1.21	2.00	33.9	109%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
Cyclohexane	45.7		ug/m³ Air	1.38	2.00	39.6	115%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Isoheptane	**60.1**	**C8**	**ug/m³ Air**	**1.64**	**2.00**	**45.5**	**132%**	**70 - 130**	**GCMSR1**	**05/09/13 09:36**	**13E0036**
2,3-Dimethylpentane	54.5		ug/m³ Air	1.64	2.00	45.5	120%	70 - 130	GCMSR1	05/09/13 09:36	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0036-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
3-Methylhexane	58.6		ug/m³ Air	1.64	2.00	45.5	129%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,2-Dichloropropane	62.1		ug/m³ Air	1.85	2.00	51.3	121%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Bromodichloromethane	85.1		ug/m³ Air	2.68	2.00	70.8	120%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Trichloroethene	56.7		ug/m³ Air	2.15	2.00	56.8	100%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,4-Dioxane	44.2		ug/m³ Air	1.44	2.00	40.0	110%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
2,2,4-Trimethylpentane	62.3		ug/m³ Air	1.87	2.00	51.8	120%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Heptane	49.8		ug/m³ Air	1.64	2.00	45.9	109%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
cis-1,3-Dichloropropene	56.2		ug/m³ Air	1.82	2.00	49.4	114%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
4-Methyl-2-pentanone (MIBK)	64.0		ug/m³ Air	1.64	2.00	44.1	145%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
Methylcyclohexane	48.4		ug/m³ Air	1.61	2.00	44.9	108%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
trans-1,3-Dichloropropene	63.5		ug/m³ Air	1.82	2.00	52.2	122%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,1,2-Trichloroethane	69.3		ug/m³ Air	2.18	2.00	61.1	113%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
2,3,4-Trimethylpentane	68.2		ug/m³ Air	1.87	2.00	52.8	129%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Toluene	47.8		ug/m³ Air	1.51	2.00	43.0	111%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
2-Methylheptane	**70.0**	**C8**	**ug/m³ Air**	**1.87**	**2.00**	**52.3**	**134%**	**70 - 130**	**GCMSR1**	**05/09/13 09:36**	**13E0036**
Chlorodibromomethane	115		ug/m³ Air	3.41	2.00	92.7	124%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
3-Methylheptane	55.5		ug/m³ Air	1.87	2.00	52.3	106%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,2-Dibromoethane (EDB)	97.8		ug/m³ Air	3.07	2.00	86.8	113%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
n-Octane	**70.5**	**C8**	**ug/m³ Air**	**1.87**	**2.00**	**52.3**	**135%**	**70 - 130**	**GCMSR1**	**05/09/13 09:36**	**13E0036**
Tetrachloroethene	77.1		ug/m³ Air	2.71	2.00	75.2	102%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Chlorobenzene	57.4		ug/m³ Air	1.84	2.00	52.0	110%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Ethylbenzene	57.4		ug/m³ Air	1.74	2.00	49.1	117%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
m-Xylene & p-Xylene	117		ug/m³ Air	3.47	2.00	96.3	122%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Bromoform	149		ug/m³ Air	4.13	2.00	115	130%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Styrene	56.3		ug/m³ Air	1.70	2.00	48.6	116%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,1,2,2-Tetrachloroethane	100		ug/m³ Air	2.75	2.00	76.8	130%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
o-Xylene	58.9		ug/m³ Air	1.74	2.00	48.6	121%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Xylenes, total	176		ug/m³ Air	5.21	2.00	145	122%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
n-Nonane	**82.8**	**C8**	**ug/m³ Air**	**2.10**	**2.00**	**57.6**	**144%**	**70 - 130**	**GCMSR1**	**05/09/13 09:36**	**13E0036**
Isopropylbenzene	62.0		ug/m³ Air	1.97	2.00	52.5	118%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
alpha-Pinene	66.1		ug/m³ Air	2.23	2.00	61.2	108%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
n-Propylbenzene	66.4		ug/m³ Air	1.97	2.00	52.9	125%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
3-Ethyltoluene	62.4		ug/m³ Air	1.97	2.00	51.4	121%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
4-Ethyltoluene	64.7		ug/m³ Air	1.97	2.00	51.9	125%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,3,5-Trimethylbenzene	66.1		ug/m³ Air	1.97	2.00	56.0	118%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
2-Ethyltoluene	60.9		ug/m³ Air	1.97	2.00	50.9	119%	70 - 130	GCMSR1	05/09/13 09:36	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Calibration Check - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0036-CCV1 (Calibration Check - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
beta-Pinene	50.8		ug/m³ Air	2.23	2.00	46.6	109%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,2,4-Trimethylbenzene	67.8		ug/m³ Air	1.97	2.00	56.0	121%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Benzyl chloride	**105**	**C8**	**ug/m³ Air**	**2.07**	**2.00**	**59.0**	**178%**	**70 - 130**	**GCMSR1**	**05/09/13 09:36**	**13E0036**
1,3-Dichlorobenzene	83.5		ug/m³ Air	2.40	2.00	68.5	122%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
n-Decane	**87.3**	**C8**	**ug/m³ Air**	**2.33**	**2.00**	**65.1**	**134%**	**70 - 130**	**GCMSR1**	**05/09/13 09:36**	**13E0036**
1,4-Dichlorobenzene	83.5		ug/m³ Air	2.40	2.00	67.9	123%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,2,3-Trimethylbenzene	59.2		ug/m³ Air	1.97	2.00	50.4	118%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,2-Dichlorobenzene	81.0		ug/m³ Air	2.40	2.00	67.9	119%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Limonene	75.4		ug/m³ Air	2.23	2.00	61.2	123%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
Indan	67.1		ug/m³ Air	1.93	2.00	53.1	126%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
Indene	63.4		ug/m³ Air	1.90	2.00	51.7	123%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
1,3-Diethylbenzene	66.0		ug/m³ Air	2.20	2.00	55.7	119%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
1,4-Diethylbenzene	66.1		ug/m³ Air	2.20	2.00	56.9	116%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
n-Undecane	90.7		ug/m³ Air	2.56	2.00	66.2	137%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
1,2,4-Trichlorobenzene	106	B	ug/m³ Air	2.97	2.00	84.6	125%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
Naphthalene	74.5	B	ug/m³ Air	2.10	2.00	54.8	136%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
Hexachlorobutadiene	136	B	ug/m³ Air	4.27	2.00	121	113%	50 - 150	GCMSR1	05/09/13 09:36	13E0036
1,2-Dichloroethene, Total	82.1		ug/m³ Air	3.17	2.00	86.6	95%	70 - 130	GCMSR1	05/09/13 09:36	13E0036
Surr: 2-Bromo-1,1,1-trifluoroethane (70-130%)	*89%*								GCMSR1	05/09/13 9:36	13E0036
Surr: Fluorobenzene (70-130%)	*84%*								GCMSR1	05/09/13 9:36	13E0036
Surr: Toluene-d8 (70-130%)	*103%*								GCMSR1	05/09/13 9:36	13E0036
Surr: 1,4-Dichlorobutane (70-130%)	*113%*								GCMSR1	05/09/13 9:36	13E0036
Surr: 4-Bromofluorobenzene (70-130%)	*109%*								GCMSR1	05/09/13 9:36	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Duplicate

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0020-DUP1 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Ethene	**1.03**	**J**	**0.833**	ug/m³ Air	21	25	13E0020	AWD0187-01RE1	05/03/13 20:45
Acetylene	ND	**U**	ND	ug/m³ Air		25	13E0020	AWD0187-01RE1	05/03/13 20:45
Ethane	**0.658**	**J**	**0.577**	ug/m³ Air	13	25	13E0020	AWD0187-01RE1	05/03/13 20:45
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*99%*						13E0020		05/03/13 20:45
Surr: Fluorobenzene (46-118%)	*94%*						13E0020		05/03/13 20:45
Surr: Toluene-d8 (70-136%)	*98%*						13E0020		05/03/13 20:45
Surr: 1,4-Dichlorobutane (38-135%)	*94%*						13E0020		05/03/13 20:45
Surr: 4-Bromofluorobenzene (51-128%)	*94%*						13E0020		05/03/13 20:45
Sample ID: 13E0020-DUP2 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Ethene	**1.38**	**J**	**1.24**	ug/m³ Air	10	25	13E0020	AWD0187-02RE1	05/03/13 22:51
Acetylene	ND	**U**	ND	ug/m³ Air		25	13E0020	AWD0187-02RE1	05/03/13 22:51
Ethane	**0.672**	**J**	**0.594**	ug/m³ Air	12	25	13E0020	AWD0187-02RE1	05/03/13 22:51
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*97%*						13E0020		05/03/13 22:51
Surr: Fluorobenzene (46-118%)	*86%*						13E0020		05/03/13 22:51
Surr: Toluene-d8 (70-136%)	*91%*						13E0020		05/03/13 22:51
Surr: 1,4-Dichlorobutane (38-135%)	*90%*						13E0020		05/03/13 22:51
Surr: 4-Bromofluorobenzene (51-128%)	*89%*						13E0020		05/03/13 22:51
Sample ID: 13E0024-DUP1 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Halocarbon 134A	**3.89**		**4.41**	ug/m³ Air	13	25	13E0024	AWD0187-03	05/06/13 16:56
Propylene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Chlorodifluoromethane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Propane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Dichlorodifluoromethane	**2.49**	**J**	**2.55**	ug/m³ Air	2	25	13E0024	AWD0187-03	05/06/13 16:56
Chloromethane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Isobutane	**0.675**	**J**	**0.679**	ug/m³ Air	0.5	25	13E0024	AWD0187-03	05/06/13 16:56
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Acetaldehyde	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0024-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Vinyl chloride	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1-Butene/Isobutene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,3-Butadiene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Butane	0.243	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Methanol	**1.59**		**1.45**	ug/m³ Air	10	50	13E0024	AWD0187-03	05/06/13 16:56
trans-2-Butene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Neopentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Dichlorofluoromethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Bromomethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
cis-2-Butene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Chloroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Vinyl bromide	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
3-Methyl-1-butene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Ethanol	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Acetonitrile	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Isopentane	**1.12**	**J**	**1.10**	ug/m³ Air	2	25	13E0024	AWD0187-03	05/06/13 16:56
Trichlorofluoromethane	**1.19**	**J**	**1.27**	ug/m³ Air	7	25	13E0024	AWD0187-03	05/06/13 16:56
1-Pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Acetone	**2.04**	**J, B**	**2.10**	ug/m³ Air	3	25	13E0024	AWD0187-03	05/06/13 16:56
Isopropyl alcohol	ND	U	ND	ug/m³ Air		50	13E0024	AWD0187-03	05/06/13 16:56
Acrylonitrile	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
n-Pentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Diethyl ether	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Isoprene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
trans-2-Pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,1-Dichloroethene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
cis-2-Pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Methylene chloride	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2-Methyl-2-butene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Carbon disulfide	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Allyl chloride	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,1,2-Trichlorotrifluoroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2,2-Dimethylbutane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Cyclopentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56

Golder Associates Ltd.
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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0024-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
trans-1,2-Dichloroethene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
4-Methyl-1-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Propanol	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,1-Dichloroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Cyclopentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2,3-Dimethylbutane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Methyl tert-Butyl Ether	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Isohexane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Vinyl acetate	ND	U	ND	ug/m³ Air		50	13E0024	AWD0187-03	05/06/13 16:56
cis/trans-4-Methyl-2-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Butyraldehyde	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2-Butanone (MEK)	**0.531**	**J**	**0.635**	ug/m³ Air	18	25	13E0024	AWD0187-03	05/06/13 16:56
Chloroprene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
3-Methylpentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2-Methyl-1-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1-Hexene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
cis-1,2-Dichloroethene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Bromochloromethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2-Ethyl-1-butene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Hexane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Chloroform	**3.87**	**J**	**4.00**	ug/m³ Air	3	25	13E0024	AWD0187-03	05/06/13 16:56
cis-3-Hexene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
trans-2-Hexene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2-Methyl-2-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
cis-3-Methyl-2-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
cis-2-Hexene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Methylcyclopentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,2-Dichloroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2,4-Dimethylpentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,1,1-Trichloroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1-Methylcyclopentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Benzene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Carbon tetrachloride	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
n-Butanol	ND	U	ND	ug/m³ Air		50	13E0024	AWD0187-03	05/06/13 16:56

Golder Associates Ltd.
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Julie Burghardt

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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0024-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Cyclohexane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Isoheptane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2,3-Dimethylpentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Cyclohexene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
3-Methylhexane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,2-Dichloropropane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Bromodichloromethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Trichloroethene	**3.20**	**J**	**3.47**	ug/m³ Air	8	25	13E0024	AWD0187-03	05/06/13 16:56
1,4-Dioxane	ND	U	ND	ug/m³ Air		50	13E0024	AWD0187-03	05/06/13 16:56
1-Heptene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2,2,4-Trimethylpentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
trans-3-Heptene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Heptane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
cis-3-Heptene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
trans-2-Heptene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2,4,4-Trimethyl-1-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
cis-1,3-Dichloropropene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
4-Methyl-2-pentanone (MIBK)	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Methylcyclohexane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2,4,4-Trimethyl-2-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2,5-Dimethylhexane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2,2,3-Trimethylpentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
trans-1,3-Dichloropropene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,1,2-Trichloroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2,3,4-Trimethylpentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Toluene	**23.0**		**23.5**	ug/m³ Air	2	25	13E0024	AWD0187-03	05/06/13 16:56
2-Hexanone	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2-Methylheptane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1-Methylcyclohexene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Chlorodibromomethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
3-Methylheptane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Hexanal	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,2-Dibromoethane (EDB)	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2,2,5-Trimethylhexane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56

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Julie Burghardt

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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0024-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
1-Octene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
n-Octane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Tetrachloroethene	ND	**R4, U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
cis-2-Octene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Chlorobenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Ethylbenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
m-Xylene & p-Xylene	ND	**R4, U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Bromoform	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Butyl acrylate	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Heptanal	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Styrene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,1,2,2-Tetrachloroethane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
o-Xylene	ND	**R4, U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Xylenes, total	ND	**R4, U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1-Nonene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
4-Nonene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
n-Nonane	ND	**R4, U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Isopropylbenzene	ND	**U**	ND	ug/m³ Air		50	13E0024	AWD0187-03	05/06/13 16:56
Benzaldehyde	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
alpha-Pinene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2 & 3-Chlorotoluene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
4-Chlorotoluene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
n-Propylbenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
3-Ethyltoluene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
4-Ethyltoluene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,3,5-Trimethylbenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
2-Ethyltoluene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
beta-Pinene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,2,4-Trimethylbenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
tert-Butylbenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1-Decene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Benzyl chloride	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,3-Dichlorobenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
n-Decane	ND	**R4, U**	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56

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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0024-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
1,4-Dichlorobenzene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Isobutylbenzene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,2,3-Trimethylbenzene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
4-Isopropyltoluene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,2-Dichlorobenzene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Limonene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Indan	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Indene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,3-Diethylbenzene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,4-Diethylbenzene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
n-Butylbenzene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1-Undecene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
n-Undecane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,2,4-Trichlorobenzene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Naphthalene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Hexachlorobutadiene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
1,2-Dichloroethene, Total	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-03	05/06/13 16:56
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*90%*						13E0024		05/06/13 16:56
Surr: Fluorobenzene (46-118%)	*71%*						13E0024		05/06/13 16:56
Surr: Toluene-d8 (70-136%)	*104%*						13E0024		05/06/13 16:56
Surr: 1,4-Dichlorobutane (38-135%)	*102%*						13E0024		05/06/13 16:56
Surr: 4-Bromofluorobenzene (51-128%)	*92%*						13E0024		05/06/13 16:56
Sample ID: 13E0024-DUP2 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Halocarbon 134A	**23.2**		**22.1**	ug/m³ Air	5	25	13E0024	AWD0187-06	05/06/13 18:54
Propylene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Chlorodifluoromethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Propane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Dichlorodifluoromethane	**2.84**	**J**	**2.69**	ug/m³ Air	5	25	13E0024	AWD0187-06	05/06/13 18:54
Chloromethane	**0.258**	**J**	**0.240**	ug/m³ Air	7	25	13E0024	AWD0187-06	05/06/13 18:54
Isobutane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54

Golder Associates Ltd.
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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0024-DUP2 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Acetaldehyde	**2.90**		**3.49**	ug/m³ Air	18	25	13E0024	AWD0187-06	05/06/13 18:54
Vinyl chloride	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1-Butene/Isobutene	**7.53**		**7.61**	ug/m³ Air	1	25	13E0024	AWD0187-06	05/06/13 18:54
1,3-Butadiene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Butane	**0.458**	J	**0.433**	ug/m³ Air	6	25	13E0024	AWD0187-06	05/06/13 18:54
Methanol	**17.2**		**16.5**	ug/m³ Air	5	50	13E0024	AWD0187-06	05/06/13 18:54
trans-2-Butene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Neopentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Dichlorofluoromethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Bromomethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
cis-2-Butene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Chloroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Vinyl bromide	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
3-Methyl-1-butene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Ethanol	**2.15**	J	**2.00**	ug/m³ Air	8	25	13E0024	AWD0187-06	05/06/13 18:54
Acetonitrile	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Isopentane	ND	R4, U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Trichlorofluoromethane	**1.22**	J	**1.08**	ug/m³ Air	13	25	13E0024	AWD0187-06	05/06/13 18:54
1-Pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Acetone	**4.40**	B	**4.34**	ug/m³ Air	1	25	13E0024	AWD0187-06	05/06/13 18:54
Isopropyl alcohol	**1.62**	J	**1.64**	ug/m³ Air	1	50	13E0024	AWD0187-06	05/06/13 18:54
Acrylonitrile	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
n-Pentane	**0.584**	J	**0.484**	ug/m³ Air	19	25	13E0024	AWD0187-06	05/06/13 18:54
Diethyl ether	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Isoprene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
trans-2-Pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,1-Dichloroethene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
cis-2-Pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Methylene chloride	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2-Methyl-2-butene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Carbon disulfide	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Allyl chloride	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,1,2-Trichlorotrifluoroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54

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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0024-DUP2 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
2,2-Dimethylbutane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Cyclopentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
trans-1,2-Dichloroethene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
4-Methyl-1-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Propanol	**4.01**		**3.71**	ug/m³ Air	8	25	13E0024	AWD0187-06	05/06/13 18:54
1,1-Dichloroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Cyclopentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2,3-Dimethylbutane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Methyl tert-Butyl Ether	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Isohexane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Vinyl acetate	ND	U	ND	ug/m³ Air		50	13E0024	AWD0187-06	05/06/13 18:54
cis/trans-4-Methyl-2-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Butyraldehyde	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2-Butanone (MEK)	**1.36**	**J**	**1.35**	ug/m³ Air	0.5	25	13E0024	AWD0187-06	05/06/13 18:54
Chloroprene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
3-Methylpentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2-Methyl-1-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1-Hexene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
cis-1,2-Dichloroethene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Bromochloromethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2-Ethyl-1-butene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Hexane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Chloroform	**20.7**		**19.5**	ug/m³ Air	6	25	13E0024	AWD0187-06	05/06/13 18:54
cis-3-Hexene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
trans-2-Hexene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2-Methyl-2-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
cis-3-Methyl-2-pentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
cis-2-Hexene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Methylcyclopentane	ND	R4, U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,2-Dichloroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2,4-Dimethylpentane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,1,1-Trichloroethane	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1-Methylcyclopentene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Benzene	ND	U	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54

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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0024-DUP2 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Carbon tetrachloride	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
n-Butanol	ND	**U**	ND	ug/m³ Air		50	13E0024	AWD0187-06	05/06/13 18:54
Cyclohexane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Isoheptane	ND	**R4, U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2,3-Dimethylpentane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Cyclohexene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
3-Methylhexane	0.412	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,2-Dichloropropane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Bromodichloromethane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Trichloroethene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,4-Dioxane	ND	**U**	ND	ug/m³ Air		50	13E0024	AWD0187-06	05/06/13 18:54
1-Heptene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2,2,4-Trimethylpentane	ND	**R4, U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
trans-3-Heptene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Heptane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
cis-3-Heptene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
trans-2-Heptene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2,4,4-Trimethyl-1-pentene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
cis-1,3-Dichloropropene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
4-Methyl-2-pentanone (MIBK)	ND	**R4, U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Methylcyclohexane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2,4,4-Trimethyl-2-pentene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2,5-Dimethylhexane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2,2,3-Trimethylpentane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
trans-1,3-Dichloropropene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,1,2-Trichloroethane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2,3,4-Trimethylpentane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Toluene	**5.98**		**5.61**	ug/m³ Air	6	25	13E0024	AWD0187-06	05/06/13 18:54
2-Hexanone	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2-Methylheptane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1-Methylcyclohexene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Chlorodibromomethane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
3-Methylheptane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Hexanal	**2.75**	**J**	**2.60**	ug/m³ Air	6	25	13E0024	AWD0187-06	05/06/13 18:54

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PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0024-DUP2 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
1,2-Dibromoethane (EDB)	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2,2,5-Trimethylhexane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1-Octene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
n-Octane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Tetrachloroethene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
cis-2-Octene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Chlorobenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Ethylbenzene	**1.08**	**J**	**1.07**	ug/m³ Air	0.9	25	13E0024	AWD0187-06	05/06/13 18:54
m-Xylene & p-Xylene	**4.97**	**J**	**4.95**	ug/m³ Air	0.4	25	13E0024	AWD0187-06	05/06/13 18:54
Bromoform	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Butyl acrylate	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Heptanal	ND	**R4, U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Styrene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,1,2,2-Tetrachloroethane	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
o-Xylene	**2.87**	**J**	**2.85**	ug/m³ Air	0.8	25	13E0024	AWD0187-06	05/06/13 18:54
Xylenes, total	**7.84**	**J**	**7.80**	ug/m³ Air	0.5	25	13E0024	AWD0187-06	05/06/13 18:54
1-Nonene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
4-Nonene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
n-Nonane	**1.15**	**J**	**0.967**	ug/m³ Air	18	25	13E0024	AWD0187-06	05/06/13 18:54
Isopropylbenzene	ND	**U**	ND	ug/m³ Air		50	13E0024	AWD0187-06	05/06/13 18:54
Benzaldehyde	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
alpha-Pinene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
2 & 3-Chlorotoluene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
4-Chlorotoluene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
n-Propylbenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
3-Ethyltoluene	**2.63**	**J**	**2.59**	ug/m³ Air	2	25	13E0024	AWD0187-06	05/06/13 18:54
4-Ethyltoluene	**1.44**	**J**	**1.33**	ug/m³ Air	8	25	13E0024	AWD0187-06	05/06/13 18:54
1,3,5-Trimethylbenzene	**1.47**	**J**	**1.37**	ug/m³ Air	7	25	13E0024	AWD0187-06	05/06/13 18:54
2-Ethyltoluene	**0.975**	**J**	**0.939**	ug/m³ Air	4	25	13E0024	AWD0187-06	05/06/13 18:54
beta-Pinene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,2,4-Trimethylbenzene	**6.55**		**6.58**	ug/m³ Air	0.5	25	13E0024	AWD0187-06	05/06/13 18:54
tert-Butylbenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1-Decene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Benzyl chloride	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54

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Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0024-DUP2 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
1,3-Dichlorobenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
n-Decane	**7.35**		**7.56**	ug/m³ Air	3	25	13E0024	AWD0187-06	05/06/13 18:54
1,4-Dichlorobenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Isobutylbenzene	ND	**R4, U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,2,3-Trimethylbenzene	**1.87**	**J**	**1.85**	ug/m³ Air	1	25	13E0024	AWD0187-06	05/06/13 18:54
4-Isopropyltoluene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,2-Dichlorobenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Limonene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Indan	**1.62**	**J**	**1.44**	ug/m³ Air	12	25	13E0024	AWD0187-06	05/06/13 18:54
Indene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,3-Diethylbenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,4-Diethylbenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
n-Butylbenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1-Undecene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
n-Undecane	**3.07**	**J**	**3.16**	ug/m³ Air	3	25	13E0024	AWD0187-06	05/06/13 18:54
1,2,4-Trichlorobenzene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Naphthalene	**2.14**	**R4, J**	**1.63**	ug/m³ Air	27	25	13E0024	AWD0187-06	05/06/13 18:54
Hexachlorobutadiene	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
1,2-Dichloroethene, Total	ND	**U**	ND	ug/m³ Air		25	13E0024	AWD0187-06	05/06/13 18:54
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*92%*						13E0024		05/06/13 18:54
Surr: Fluorobenzene (46-118%)	*74%*						13E0024		05/06/13 18:54
Surr: Toluene-d8 (70-136%)	*97%*						13E0024		05/06/13 18:54
Surr: 1,4-Dichlorobutane (38-135%)	*98%*						13E0024		05/06/13 18:54
Surr: 4-Bromofluorobenzene (51-128%)	*90%*						13E0024		05/06/13 18:54
Sample ID: 13E0036-DUP1 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Chloromethane	**1.33**	**J**	**1.37**	ug/m³ Air	3	25	13E0036	AWE0029-02	05/09/13 21:09
Vinyl chloride	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-02	05/09/13 21:09
1,3-Butadiene	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-02	05/09/13 21:09
Acetonitrile	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-02	05/09/13 21:09
Acrylonitrile	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-02	05/09/13 21:09

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

Duplicate - Cont.

Analyte	Orig.	Data Qualifier	Duplicate	Units	RPD	Limit	QC Batch	Sample Duplicated	Date Analyzed
Sample ID: 13E0036-DUP1 (Duplicate - Air) - cont.									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Methylene chloride	**0.437**	**J**	**0.463**	ug/m³ Air	6	25	13E0036	AWE0029-02	05/09/13 21:09
Chloroform	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-02	05/09/13 21:09
1,2-Dichloroethane	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-02	05/09/13 21:09
Benzene	**0.663**	**J**	**0.611**	ug/m³ Air	8	25	13E0036	AWE0029-02	05/09/13 21:09
Toluene	**5.95**		**6.08**	ug/m³ Air	2	25	13E0036	AWE0029-02	05/09/13 21:09
Tetrachloroethene	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-02	05/09/13 21:09
Styrene	**1.32**	**J**	**1.31**	ug/m³ Air	0.6	25	13E0036	AWE0029-02	05/09/13 21:09
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*90%*						13E0036		05/09/13 21:09
Surr: Fluorobenzene (46-118%)	*76%*						13E0036		05/09/13 21:09
Surr: Toluene-d8 (70-136%)	*102%*						13E0036		05/09/13 21:09
Surr: 1,4-Dichlorobutane (38-135%)	*100%*						13E0036		05/09/13 21:09
Surr: 4-Bromofluorobenzene (51-128%)	*91%*						13E0036		05/09/13 21:09
Sample ID: 13E0036-DUP2 (Duplicate - Air)									
EPA TO15 - Volatile Organic Compounds by GC/MS									
Chloromethane	**1.38**	**J**	**1.51**	ug/m³ Air	9	25	13E0036	AWE0029-03	05/09/13 23:07
Vinyl chloride	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-03	05/09/13 23:07
1,3-Butadiene	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-03	05/09/13 23:07
Acetonitrile	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-03	05/09/13 23:07
Acrylonitrile	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-03	05/09/13 23:07
Methylene chloride	0.303	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-03	05/09/13 23:07
Chloroform	ND	**R4, U**	ND	ug/m³ Air		25	13E0036	AWE0029-03	05/09/13 23:07
Benzene	**0.474**	**J**	**0.507**	ug/m³ Air	7	25	13E0036	AWE0029-03	05/09/13 23:07
Toluene	**39.9**		**42.2**	ug/m³ Air	6	25	13E0036	AWE0029-03	05/09/13 23:07
Tetrachloroethene	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-03	05/09/13 23:07
Styrene	ND	**U**	ND	ug/m³ Air		25	13E0036	AWE0029-03	05/09/13 23:07
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*90%*						13E0036		05/09/13 23:07
Surr: Fluorobenzene (46-118%)	*74%*						13E0036		05/09/13 23:07
Surr: Toluene-d8 (70-136%)	*104%*						13E0036		05/09/13 23:07
Surr: 1,4-Dichlorobutane (38-135%)	*100%*						13E0036		05/09/13 23:07
Surr: 4-Bromofluorobenzene (51-128%)	*93%*						13E0036		05/09/13 23:07

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
14050 Summit Drive, Suite A100 Austin, TX 78728 * 512-244-0855 * Fax 512-244-0160

Golder Associates Ltd.	Work Order:	AWD0187	Received: 04/29/13 08:15
500-4260 Still Creek Drive			Reported: 05/16/13 06:57
Burnaby, British Columbia, CANADA V5C6C6	Project:	AENV Canada Creosote	
Julie Burghardt	Project Number:	11-1324-0164	

PROJECT QUALITY CONTROL DATA

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0020-BS1 (LCS - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Ethene	12.6		ug/m³ Air	0.459	2.00	12.6	100%	50 - 150	VMSC	05/03/13 14:30	13E0020
Acetylene	11.8		ug/m³ Air	0.426	2.00	11.7	101%	50 - 150	VMSC	05/03/13 14:30	13E0020
Ethane	13.2		ug/m³ Air	0.492	2.00	13.5	98%	50 - 150	VMSC	05/03/13 14:30	13E0020
Benzene	33.5		ug/m³ Air	1.28	2.00	34.7	97%	50 - 150	VMSC	05/03/13 14:30	13E0020
Toluene	42.2		ug/m³ Air	1.51	2.00	41.7	101%	50 - 150	VMSC	05/03/13 14:30	13E0020
Ethylbenzene	49.2		ug/m³ Air	1.74	2.00	48.0	102%	50 - 150	VMSC	05/03/13 14:30	13E0020
m-Xylene & p-Xylene	100		ug/m³ Air	3.47	2.00	94.2	107%	50 - 150	VMSC	05/03/13 14:30	13E0020
o-Xylene	50.4		ug/m³ Air	1.74	2.00	48.5	104%	50 - 150	VMSC	05/03/13 14:30	13E0020
Xylenes, total	151		ug/m³ Air	5.21	2.00	143	106%	50 - 150	VMSC	05/03/13 14:30	13E0020
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*100%*								VMSC	05/03/13 14:30	13E0020
Surr: Fluorobenzene (46-118%)	*104%*								VMSC	05/03/13 14:30	13E0020
Surr: Toluene-d8 (70-136%)	*101%*								VMSC	05/03/13 14:30	13E0020
Surr: 1,4-Dichlorobutane (38-135%)	*109%*								VMSC	05/03/13 14:30	13E0020
Surr: 4-Bromofluorobenzene (51-128%)	*102%*								VMSC	05/03/13 14:30	13E0020
Sample ID: 13E0024-BS1 (LCS - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Propylene	20.3		ug/m³ Air	0.688	2.00	18.5	110%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Chlorodifluoromethane	42.3		ug/m³ Air	1.41	2.00	38.1	111%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Propane	20.6		ug/m³ Air	0.721	2.00	19.2	107%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Dichlorodifluoromethane	51.3		ug/m³ Air	1.98	2.00	52.7	97%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Chloromethane	24.3		ug/m³ Air	0.826	2.00	22.5	108%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Isobutane	26.5		ug/m³ Air	0.951	2.00	25.3	105%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,2-Dichloro-1,1,2,2-tetrafluoroethane	61.6		ug/m³ Air	2.80	2.00	75.2	82%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Vinyl chloride	27.6		ug/m³ Air	1.02	2.00	27.5	100%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1-Butene/Isobutene	25.8		ug/m³ Air	0.918	2.00	24.2	107%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,3-Butadiene	27.7		ug/m³ Air	0.885	2.00	24.3	114%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Butane	26.8		ug/m³ Air	0.951	2.00	25.3	106%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Methanol	14.2		ug/m³ Air	0.524	2.00	14.4	99%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
trans-2-Butene	26.0		ug/m³ Air	0.918	2.00	24.0	109%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Bromomethane	38.6		ug/m³ Air	1.55	2.00	41.4	93%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
cis-2-Butene	28.0		ug/m³ Air	0.918	2.00	25.9	108%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Chloroethane	28.2		ug/m³ Air	1.06	2.00	27.8	101%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Vinyl bromide	38.9		ug/m³ Air	1.75	2.00	47.6	82%	50 - 150	GCMSR1	05/06/13 10:05	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0024-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
3-Methyl-1-butene	33.8		ug/m³ Air	1.15	2.00	31.5	107%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Acetonitrile	20.5		ug/m³ Air	0.672	2.00	17.7	116%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Isopentane	33.6		ug/m³ Air	1.18	2.00	33.0	102%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Trichlorofluoromethane	60.3		ug/m³ Air	2.25	2.00	62.9	96%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1-Pentene	37.1		ug/m³ Air	1.15	2.00	33.3	111%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Acetone	28.2	B	ug/m³ Air	0.950	2.00	26.6	106%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Isopropyl alcohol	36.9		ug/m³ Air	0.983	2.00	29.9	123%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Acrylonitrile	26.9		ug/m³ Air	0.868	2.00	24.3	111%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
n-Pentane	37.4		ug/m³ Air	1.18	2.00	33.0	113%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Diethyl ether	34.9		ug/m³ Air	1.21	2.00	33.6	104%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Isoprene	29.1		ug/m³ Air	1.11	2.00	30.9	94%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
trans-2-Pentene	32.6		ug/m³ Air	1.15	2.00	32.4	101%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,1-Dichloroethene	43.9		ug/m³ Air	1.59	2.00	44.8	98%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
cis-2-Pentene	32.9		ug/m³ Air	1.15	2.00	32.7	100%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Methylene chloride	42.9		ug/m³ Air	1.39	2.00	38.1	113%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
2-Methyl-2-butene	33.1		ug/m³ Air	1.15	2.00	34.0	98%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Carbon disulfide	24.9		ug/m³ Air	1.25	2.00	34.9	71%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Allyl chloride	46.4		ug/m³ Air	1.25	2.00	34.4	135%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,1,2-Trichlorotrifluoroethane	73.8		ug/m³ Air	3.07	2.00	86.6	85%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
trans-1,2-Dichloroethene	42.8		ug/m³ Air	1.59	2.00	43.9	98%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
4-Methyl-1-pentene	45.4		ug/m³ Air	1.38	2.00	38.2	119%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,1-Dichloroethane	44.3		ug/m³ Air	1.62	2.00	44.9	99%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Methyl tert-Butyl Ether	40.0		ug/m³ Air	1.44	2.00	40.3	99%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Vinyl acetate	44.9		ug/m³ Air	1.41	2.00	40.5	111%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
2-Butanone (MEK)	34.6		ug/m³ Air	1.18	2.00	34.0	102%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Chloroprene	39.0		ug/m³ Air	1.45	2.00	40.1	97%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
cis-1,2-Dichloroethene	44.2		ug/m³ Air	1.59	2.00	44.8	99%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Hexane	37.5		ug/m³ Air	1.41	2.00	41.4	91%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Chloroform	52.4		ug/m³ Air	1.95	2.00	53.1	99%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
trans-2-Hexene	39.5		ug/m³ Air	1.38	2.00	39.6	100%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
cis-2-Hexene	36.3		ug/m³ Air	1.38	2.00	37.8	96%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,2-Dichloroethane	47.6		ug/m³ Air	1.62	2.00	44.9	106%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,1,1-Trichloroethane	60.7		ug/m³ Air	2.18	2.00	60.5	100%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Benzene	40.5		ug/m³ Air	1.28	2.00	35.4	114%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Carbon tetrachloride	101		ug/m³ Air	2.52	2.00	76.5	132%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
n-Butanol	38.6		ug/m³ Air	1.21	2.00	36.9	105%	50 - 150	GCMSR1	05/06/13 10:05	13E0024

Golder Associates Ltd.
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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0024-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Cyclohexane	45.0		ug/m³ Air	1.38	2.00	38.9	116%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,2-Dichloropropane	65.7		ug/m³ Air	1.85	2.00	51.7	127%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Bromodichloromethane	96.5		ug/m³ Air	2.68	2.00	75.7	127%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Trichloroethene	59.5		ug/m³ Air	2.15	2.00	60.7	98%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,4-Dioxane	44.5		ug/m³ Air	1.44	2.00	40.7	109%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
2,2,4-Trimethylpentane	62.2		ug/m³ Air	1.87	2.00	52.3	119%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Heptane	49.9		ug/m³ Air	1.64	2.00	46.8	107%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
cis-1,3-Dichloropropene	62.8		ug/m³ Air	1.82	2.00	51.8	121%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
4-Methyl-2-pentanone (MIBK)	55.8		ug/m³ Air	1.64	2.00	47.6	117%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
trans-1,3-Dichloropropene	61.9		ug/m³ Air	1.82	2.00	47.8	129%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,1,2-Trichloroethane	73.1		ug/m³ Air	2.18	2.00	61.7	119%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Toluene	49.2		ug/m³ Air	1.51	2.00	42.6	115%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
2-Hexanone	64.7		ug/m³ Air	1.64	2.00	48.5	133%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Chlorodibromomethane	129		ug/m³ Air	3.41	2.00	102	126%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,2-Dibromoethane (EDB)	102		ug/m³ Air	3.07	2.00	86.8	117%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
n-Octane	68.7		ug/m³ Air	1.87	2.00	52.3	131%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Tetrachloroethene	79.0		ug/m³ Air	2.71	2.00	71.5	110%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Chlorobenzene	60.0		ug/m³ Air	1.84	2.00	52.5	114%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Ethylbenzene	59.9		ug/m³ Air	1.74	2.00	49.1	122%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
m-Xylene & p-Xylene	122		ug/m³ Air	3.47	2.00	96.3	127%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Bromoform	**181**	**L1**	**ug/m³ Air**	**4.13**	**2.00**	**115**	**158%**	**50 - 150**	**GCMSR1**	**05/06/13 10:05**	**13E0024**
Styrene	57.8		ug/m³ Air	1.70	2.00	48.6	119%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,1,2,2-Tetrachloroethane	104		ug/m³ Air	2.75	2.00	78.3	133%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
o-Xylene	61.7		ug/m³ Air	1.74	2.00	49.5	125%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Xylenes, total	184		ug/m³ Air	5.21	2.00	146	126%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
n-Nonane	82.4		ug/m³ Air	2.10	2.00	58.1	142%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Isopropylbenzene	66.3		ug/m³ Air	1.97	2.00	54.0	123%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
2 & 3-Chlorotoluene	74.6		ug/m³ Air	4.14	2.00	57.4	130%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
n-Propylbenzene	71.5		ug/m³ Air	1.97	2.00	53.4	134%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
4-Ethyltoluene	74.5		ug/m³ Air	1.97	2.00	57.1	130%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,3,5-Trimethylbenzene	68.8		ug/m³ Air	1.97	2.00	55.0	125%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,2,4-Trimethylbenzene	71.7		ug/m³ Air	1.97	2.00	54.0	133%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
tert-Butylbenzene	84.7		ug/m³ Air	2.20	2.00	60.3	141%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Benzyl chloride	**127**	**L1**	**ug/m³ Air**	**2.07**	**2.00**	**59.1**	**215%**	**50 - 150**	**GCMSR1**	**05/06/13 10:05**	**13E0024**
1,3-Dichlorobenzene	84.3		ug/m³ Air	2.40	2.00	68.6	123%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
n-Decane	88.3		ug/m³ Air	2.33	2.00	65.1	136%	50 - 150	GCMSR1	05/06/13 10:05	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0024-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
1,4-Dichlorobenzene	84.7		ug/m³ Air	2.40	2.00	67.3	126%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
4-Isopropyltoluene	75.9		ug/m³ Air	2.20	2.00	59.7	127%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,2-Dichlorobenzene	82.6		ug/m³ Air	2.40	2.00	67.9	122%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
n-Butylbenzene	80.0		ug/m³ Air	2.20	2.00	59.7	134%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
n-Undecane	87.8		ug/m³ Air	2.56	2.00	70.8	124%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,2,4-Trichlorobenzene	105	B	ug/m³ Air	2.97	2.00	83.9	125%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Naphthalene	65.4		ug/m³ Air	2.10	2.00	55.8	117%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Hexachlorobutadiene	139		ug/m³ Air	4.27	2.00	119	117%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
1,2-Dichloroethene, Total	87.0		ug/m³ Air	3.17	2.00	88.7	98%	50 - 150	GCMSR1	05/06/13 10:05	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*93%*								GCMSR1	05/06/13 10:05	13E0024
Surr: Fluorobenzene (46-118%)	*88%*								GCMSR1	05/06/13 10:05	13E0024
Surr: Toluene-d8 (70-136%)	*100%*								GCMSR1	05/06/13 10:05	13E0024
Surr: 1,4-Dichlorobutane (38-135%)	*114%*								GCMSR1	05/06/13 10:05	13E0024
Surr: 4-Bromofluorobenzene (51-128%)	*108%*								GCMSR1	05/06/13 10:05	13E0024
Sample ID: 13E0036-BS1 (LCS - Air)											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Propylene	20.3		ug/m³ Air	0.688	2.00	18.5	110%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Chlorodifluoromethane	43.4		ug/m³ Air	1.41	2.00	38.1	114%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Propane	21.5		ug/m³ Air	0.721	2.00	19.2	112%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Dichlorodifluoromethane	53.9		ug/m³ Air	1.98	2.00	52.7	102%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Chloromethane	25.5		ug/m³ Air	0.826	2.00	22.5	114%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Isobutane	27.6		ug/m³ Air	0.951	2.00	25.3	109%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,2-Dichloro-1,1,2,2-tetrafluoroethane	62.3		ug/m³ Air	2.80	2.00	75.2	83%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Vinyl chloride	28.3		ug/m³ Air	1.02	2.00	27.5	103%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1-Butene/Isobutene	26.3		ug/m³ Air	0.918	2.00	24.2	109%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,3-Butadiene	28.1		ug/m³ Air	0.885	2.00	24.3	116%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Butane	27.8		ug/m³ Air	0.951	2.00	25.3	110%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Methanol	14.2	B	ug/m³ Air	0.524	2.00	14.4	99%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
trans-2-Butene	26.7		ug/m³ Air	0.918	2.00	24.0	112%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Bromomethane	39.3		ug/m³ Air	1.55	2.00	41.4	95%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
cis-2-Butene	28.9		ug/m³ Air	0.918	2.00	25.9	111%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Chloroethane	28.8		ug/m³ Air	1.06	2.00	27.8	104%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Vinyl bromide	39.8		ug/m³ Air	1.75	2.00	47.6	84%	50 - 150	GCMSR1	05/09/13 10:35	13E0036

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0036-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
3-Methyl-1-butene	34.6		ug/m³ Air	1.15	2.00	31.5	110%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Acetonitrile	20.5		ug/m³ Air	0.672	2.00	17.7	116%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Isopentane	35.0		ug/m³ Air	1.18	2.00	33.0	106%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Trichlorofluoromethane	61.8		ug/m³ Air	2.25	2.00	62.9	98%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1-Pentene	38.7		ug/m³ Air	1.15	2.00	33.3	116%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Acetone	28.7	B	ug/m³ Air	0.950	2.00	26.6	108%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Isopropyl alcohol	37.9		ug/m³ Air	0.983	2.00	29.9	127%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Acrylonitrile	26.9		ug/m³ Air	0.868	2.00	24.3	111%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
n-Pentane	38.2		ug/m³ Air	1.18	2.00	33.0	116%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Diethyl ether	35.7		ug/m³ Air	1.21	2.00	33.6	106%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Isoprene	29.8		ug/m³ Air	1.11	2.00	30.9	97%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
trans-2-Pentene	33.6		ug/m³ Air	1.15	2.00	32.4	104%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,1-Dichloroethene	45.8		ug/m³ Air	1.59	2.00	44.8	102%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
cis-2-Pentene	34.0		ug/m³ Air	1.15	2.00	32.7	104%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Methylene chloride	44.5		ug/m³ Air	1.39	2.00	38.1	117%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
2-Methyl-2-butene	34.1		ug/m³ Air	1.15	2.00	34.0	100%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Carbon disulfide	25.3		ug/m³ Air	1.25	2.00	34.9	72%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Allyl chloride	47.4		ug/m³ Air	1.25	2.00	34.4	138%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,1,2-Trichlorotrifluoroethane	75.0		ug/m³ Air	3.07	2.00	86.6	87%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
trans-1,2-Dichloroethene	46.9		ug/m³ Air	1.59	2.00	43.9	107%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
4-Methyl-1-pentene	49.0		ug/m³ Air	1.38	2.00	38.2	128%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,1-Dichloroethane	45.4		ug/m³ Air	1.62	2.00	44.9	101%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Methyl tert-Butyl Ether	40.3		ug/m³ Air	1.44	2.00	40.3	100%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Vinyl acetate	44.9		ug/m³ Air	1.41	2.00	40.5	111%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
2-Butanone (MEK)	34.5		ug/m³ Air	1.18	2.00	34.0	102%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Chloroprene	40.1		ug/m³ Air	1.45	2.00	40.1	100%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
cis-1,2-Dichloroethene	45.6		ug/m³ Air	1.59	2.00	44.8	102%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Hexane	38.6		ug/m³ Air	1.41	2.00	41.4	93%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Chloroform	53.6		ug/m³ Air	1.95	2.00	53.1	101%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
trans-2-Hexene	40.2		ug/m³ Air	1.38	2.00	39.6	101%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
cis-2-Hexene	36.8		ug/m³ Air	1.38	2.00	37.8	97%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,2-Dichloroethane	49.1		ug/m³ Air	1.62	2.00	44.9	110%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,1,1-Trichloroethane	62.8		ug/m³ Air	2.18	2.00	60.5	104%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Benzene	42.7		ug/m³ Air	1.28	2.00	35.4	121%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Carbon tetrachloride	108		ug/m³ Air	2.52	2.00	76.5	141%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
n-Butanol	39.9		ug/m³ Air	1.21	2.00	36.9	108%	50 - 150	GCMSR1	05/09/13 10:35	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0036-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
Cyclohexane	48.2		ug/m³ Air	1.38	2.00	38.9	124%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,2-Dichloropropane	69.2		ug/m³ Air	1.85	2.00	51.7	134%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Bromodichloromethane	103		ug/m³ Air	2.68	2.00	75.7	136%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Trichloroethene	62.6		ug/m³ Air	2.15	2.00	60.7	103%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,4-Dioxane	45.7		ug/m³ Air	1.44	2.00	40.7	112%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
2,2,4-Trimethylpentane	66.4		ug/m³ Air	1.87	2.00	52.3	127%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Heptane	53.1		ug/m³ Air	1.64	2.00	46.8	114%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
cis-1,3-Dichloropropene	66.4		ug/m³ Air	1.82	2.00	51.8	128%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
4-Methyl-2-pentanone (MIBK)	60.7		ug/m³ Air	1.64	2.00	47.6	127%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
trans-1,3-Dichloropropene	65.6		ug/m³ Air	1.82	2.00	47.8	137%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,1,2-Trichloroethane	76.2		ug/m³ Air	2.18	2.00	61.7	124%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Toluene	51.5		ug/m³ Air	1.51	2.00	42.6	121%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
2-Hexanone	70.7		ug/m³ Air	1.64	2.00	48.5	146%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Chlorodibromomethane	135		ug/m³ Air	3.41	2.00	102	133%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,2-Dibromoethane (EDB)	106		ug/m³ Air	3.07	2.00	86.8	122%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
n-Octane	73.5		ug/m³ Air	1.87	2.00	52.3	141%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Tetrachloroethene	83.4		ug/m³ Air	2.71	2.00	71.5	117%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Chlorobenzene	62.4		ug/m³ Air	1.84	2.00	52.5	119%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Ethylbenzene	62.1		ug/m³ Air	1.74	2.00	49.1	127%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
m-Xylene & p-Xylene	127		ug/m³ Air	3.47	2.00	96.3	131%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Bromoform	**187**	**L1**	**ug/m³ Air**	**4.13**	**2.00**	**115**	**163%**	**50 - 150**	**GCMSR1**	**05/09/13 10:35**	**13E0036**
Styrene	59.7		ug/m³ Air	1.70	2.00	48.6	123%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,1,2,2-Tetrachloroethane	107		ug/m³ Air	2.75	2.00	78.3	137%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
o-Xylene	63.8		ug/m³ Air	1.74	2.00	49.5	129%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Xylenes, total	190		ug/m³ Air	5.21	2.00	146	131%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
n-Nonane	**88.3**	**L1**	**ug/m³ Air**	**2.10**	**2.00**	**58.1**	**152%**	**50 - 150**	**GCMSR1**	**05/09/13 10:35**	**13E0036**
Isopropylbenzene	68.3		ug/m³ Air	1.97	2.00	54.0	127%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
2 & 3-Chlorotoluene	76.8		ug/m³ Air	4.14	2.00	57.4	134%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
n-Propylbenzene	73.0		ug/m³ Air	1.97	2.00	53.4	137%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
4-Ethyltoluene	76.5		ug/m³ Air	1.97	2.00	57.1	134%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,3,5-Trimethylbenzene	70.7		ug/m³ Air	1.97	2.00	55.0	128%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,2,4-Trimethylbenzene	73.5		ug/m³ Air	1.97	2.00	54.0	136%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
tert-Butylbenzene	87.4		ug/m³ Air	2.20	2.00	60.3	145%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Benzyl chloride	**130**	**L1**	**ug/m³ Air**	**2.07**	**2.00**	**59.1**	**220%**	**50 - 150**	**GCMSR1**	**05/09/13 10:35**	**13E0036**
1,3-Dichlorobenzene	87.2		ug/m³ Air	2.40	2.00	68.6	127%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
n-Decane	94.4		ug/m³ Air	2.33	2.00	65.1	145%	50 - 150	GCMSR1	05/09/13 10:35	13E0036

Golder Associates Ltd.
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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	Instrument	Date Analyzed	QC Batch
Sample ID: 13E0036-BS1 (LCS - Air) - cont.											
EPA TO15 - Volatile Organic Compounds by GC/MS											
1,4-Dichlorobenzene	87.5		ug/m³ Air	2.40	2.00	67.3	130%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
4-Isopropyltoluene	78.0		ug/m³ Air	2.20	2.00	59.7	131%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,2-Dichlorobenzene	84.7		ug/m³ Air	2.40	2.00	67.9	125%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
n-Butylbenzene	81.9		ug/m³ Air	2.20	2.00	59.7	137%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
n-Undecane	92.3		ug/m³ Air	2.56	2.00	70.8	130%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,2,4-Trichlorobenzene	112	B	ug/m³ Air	2.97	2.00	83.9	133%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Naphthalene	69.3	B	ug/m³ Air	2.10	2.00	55.8	124%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Hexachlorobutadiene	147	B	ug/m³ Air	4.27	2.00	119	123%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
1,2-Dichloroethene, Total	92.4		ug/m³ Air	3.17	2.00	88.7	104%	50 - 150	GCMSR1	05/09/13 10:35	13E0036
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*90%*								GCMSR1	05/09/13 10:35	13E0036
Surr: Fluorobenzene (46-118%)	*85%*								GCMSR1	05/09/13 10:35	13E0036
Surr: Toluene-d8 (70-136%)	*100%*								GCMSR1	05/09/13 10:35	13E0036
Surr: 1,4-Dichlorobutane (38-135%)	*114%*								GCMSR1	05/09/13 10:35	13E0036
Surr: 4-Bromofluorobenzene (51-128%)	*108%*								GCMSR1	05/09/13 10:35	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS Dup

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	RPD Limit	Date Analyzed	QC Batch
Sample ID: 13E0020-BSD1 (LCS Dup - Air)												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Ethene	13.1		ug/m³ Air	0.459	2.00	12.6	104%	50 - 150	4	25	05/03/13 15:32	13E0020
Acetylene	12.1		ug/m³ Air	0.426	2.00	11.7	104%	50 - 150	2	25	05/03/13 15:32	13E0020
Ethane	13.6		ug/m³ Air	0.492	2.00	13.5	101%	50 - 150	4	25	05/03/13 15:32	13E0020
Benzene	33.0		ug/m³ Air	1.28	2.00	34.7	95%	50 - 150	1	25	05/03/13 15:32	13E0020
Toluene	41.1		ug/m³ Air	1.51	2.00	41.7	99%	50 - 150	3	25	05/03/13 15:32	13E0020
Ethylbenzene	47.9		ug/m³ Air	1.74	2.00	48.0	100%	50 - 150	3	25	05/03/13 15:32	13E0020
m-Xylene & p-Xylene	97.1		ug/m³ Air	3.47	2.00	94.2	103%	50 - 150	3	25	05/03/13 15:32	13E0020
o-Xylene	49.6		ug/m³ Air	1.74	2.00	48.5	102%	50 - 150	2	25	05/03/13 15:32	13E0020
Xylenes, total	147		ug/m³ Air	5.21	2.00	143	103%	50 - 150	3	25	05/03/13 15:32	13E0020
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*97%*										05/03/13 15:32	13E0020
Surr: Fluorobenzene (46-118%)	*104%*										05/03/13 15:32	13E0020
Surr: Toluene-d8 (70-136%)	*101%*										05/03/13 15:32	13E0020
Surr: 1,4-Dichlorobutane (38-135%)	*107%*										05/03/13 15:32	13E0020
Surr: 4-Bromofluorobenzene (51-128%)	*101%*										05/03/13 15:32	13E0020
Sample ID: 13E0024-BSD1 (LCS Dup - Air)												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Propylene	20.2		ug/m³ Air	0.688	2.00	18.5	109%	50 - 150	0.6	25	05/06/13 11:03	13E0024
Chlorodifluoromethane	42.1		ug/m³ Air	1.41	2.00	38.1	111%	50 - 150	0.5	25	05/06/13 11:03	13E0024
Propane	21.1		ug/m³ Air	0.721	2.00	19.2	110%	50 - 150	2	25	05/06/13 11:03	13E0024
Dichlorodifluoromethane	53.0		ug/m³ Air	1.98	2.00	52.7	101%	50 - 150	3	25	05/06/13 11:03	13E0024
Chloromethane	24.8		ug/m³ Air	0.826	2.00	22.5	110%	50 - 150	2	25	05/06/13 11:03	13E0024
Isobutane	27.1		ug/m³ Air	0.951	2.00	25.3	107%	50 - 150	2	25	05/06/13 11:03	13E0024
1,2-Dichloro-1,1,2,2-tetrafluoroethane	60.8		ug/m³ Air	2.80	2.00	75.2	81%	50 - 150	1	25	05/06/13 11:03	13E0024
Vinyl chloride	27.8		ug/m³ Air	1.02	2.00	27.5	101%	50 - 150	0.8	25	05/06/13 11:03	13E0024
1-Butene/Isobutene	25.6		ug/m³ Air	0.918	2.00	24.2	106%	50 - 150	0.9	25	05/06/13 11:03	13E0024
1,3-Butadiene	27.3		ug/m³ Air	0.885	2.00	24.3	112%	50 - 150	1	25	05/06/13 11:03	13E0024
Butane	27.2		ug/m³ Air	0.951	2.00	25.3	107%	50 - 150	1	25	05/06/13 11:03	13E0024
Methanol	13.8		ug/m³ Air	0.524	2.00	14.4	96%	50 - 150	3	50	05/06/13 11:03	13E0024
trans-2-Butene	25.8		ug/m³ Air	0.918	2.00	24.0	108%	50 - 150	1	25	05/06/13 11:03	13E0024
Bromomethane	39.0		ug/m³ Air	1.55	2.00	41.4	94%	50 - 150	0.9	25	05/06/13 11:03	13E0024
cis-2-Butene	27.8		ug/m³ Air	0.918	2.00	25.9	107%	50 - 150	0.5	25	05/06/13 11:03	13E0024
Chloroethane	27.9		ug/m³ Air	1.06	2.00	27.8	100%	50 - 150	1	25	05/06/13 11:03	13E0024
Vinyl bromide	39.5		ug/m³ Air	1.75	2.00	47.6	83%	50 - 150	1	25	05/06/13 11:03	13E0024

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Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	Limit	Date Analyzed	QC Batch
Sample ID: 13E0024-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
3-Methyl-1-butene	33.9		ug/m³ Air	1.15	2.00	31.5	108%	50 - 150	0.3	25	05/06/13 11:03	13E0024
Acetonitrile	19.2		ug/m³ Air	0.672	2.00	17.7	109%	50 - 150	7	25	05/06/13 11:03	13E0024
Isopentane	33.6		ug/m³ Air	1.18	2.00	33.0	102%	50 - 150	0.2	25	05/06/13 11:03	13E0024
Trichlorofluoromethane	60.3		ug/m³ Air	2.25	2.00	62.9	96%	50 - 150	0.05	25	05/06/13 11:03	13E0024
1-Pentene	37.0		ug/m³ Air	1.15	2.00	33.3	111%	50 - 150	0.3	25	05/06/13 11:03	13E0024
Acetone	26.9	B	ug/m³ Air	0.950	2.00	26.6	101%	50 - 150	5	25	05/06/13 11:03	13E0024
Isopropyl alcohol	37.8		ug/m³ Air	0.983	2.00	29.9	126%	50 - 150	2	50	05/06/13 11:03	13E0024
Acrylonitrile	25.7		ug/m³ Air	0.868	2.00	24.3	106%	50 - 150	4	25	05/06/13 11:03	13E0024
n-Pentane	36.9		ug/m³ Air	1.18	2.00	33.0	112%	50 - 150	1	25	05/06/13 11:03	13E0024
Diethyl ether	34.5		ug/m³ Air	1.21	2.00	33.6	103%	50 - 150	1	25	05/06/13 11:03	13E0024
Isoprene	28.9		ug/m³ Air	1.11	2.00	30.9	94%	50 - 150	0.6	25	05/06/13 11:03	13E0024
trans-2-Pentene	32.4		ug/m³ Air	1.15	2.00	32.4	100%	50 - 150	0.7	25	05/06/13 11:03	13E0024
1,1-Dichloroethene	43.9		ug/m³ Air	1.59	2.00	44.8	98%	50 - 150	0.2	25	05/06/13 11:03	13E0024
cis-2-Pentene	32.9		ug/m³ Air	1.15	2.00	32.7	101%	50 - 150	0.06	25	05/06/13 11:03	13E0024
Methylene chloride	43.1		ug/m³ Air	1.39	2.00	38.1	113%	50 - 150	0.4	25	05/06/13 11:03	13E0024
2-Methyl-2-butene	33.1		ug/m³ Air	1.15	2.00	34.0	97%	50 - 150	0.2	25	05/06/13 11:03	13E0024
Carbon disulfide	25.1		ug/m³ Air	1.25	2.00	34.9	72%	50 - 150	0.9	25	05/06/13 11:03	13E0024
Allyl chloride	46.6		ug/m³ Air	1.25	2.00	34.4	136%	50 - 150	0.4	25	05/06/13 11:03	13E0024
1,1,2-Trichlorotrifluoroethane	74.0		ug/m³ Air	3.07	2.00	86.6	85%	50 - 150	0.3	25	05/06/13 11:03	13E0024
trans-1,2-Dichloroethene	43.5		ug/m³ Air	1.59	2.00	43.9	99%	50 - 150	2	25	05/06/13 11:03	13E0024
4-Methyl-1-pentene	45.5		ug/m³ Air	1.38	2.00	38.2	119%	50 - 150	0.3	25	05/06/13 11:03	13E0024
1,1-Dichloroethane	44.2		ug/m³ Air	1.62	2.00	44.9	99%	50 - 150	0.05	25	05/06/13 11:03	13E0024
Methyl tert-Butyl Ether	38.8		ug/m³ Air	1.44	2.00	40.3	96%	50 - 150	3	25	05/06/13 11:03	13E0024
Vinyl acetate	42.8		ug/m³ Air	1.41	2.00	40.5	106%	50 - 150	5	50	05/06/13 11:03	13E0024
2-Butanone (MEK)	33.0		ug/m³ Air	1.18	2.00	34.0	97%	50 - 150	5	25	05/06/13 11:03	13E0024
Chloroprene	39.0		ug/m³ Air	1.45	2.00	40.1	97%	50 - 150	0.2	25	05/06/13 11:03	13E0024
cis-1,2-Dichloroethene	44.5		ug/m³ Air	1.59	2.00	44.8	99%	50 - 150	0.7	25	05/06/13 11:03	13E0024
Hexane	37.7		ug/m³ Air	1.41	2.00	41.4	91%	50 - 150	0.7	25	05/06/13 11:03	13E0024
Chloroform	52.7		ug/m³ Air	1.95	2.00	53.1	99%	50 - 150	0.6	25	05/06/13 11:03	13E0024
trans-2-Hexene	39.4		ug/m³ Air	1.38	2.00	39.6	99%	50 - 150	0.2	25	05/06/13 11:03	13E0024
cis-2-Hexene	36.2		ug/m³ Air	1.38	2.00	37.8	96%	50 - 150	0.2	25	05/06/13 11:03	13E0024
1,2-Dichloroethane	47.6		ug/m³ Air	1.62	2.00	44.9	106%	50 - 150	0.09	25	05/06/13 11:03	13E0024
1,1,1-Trichloroethane	60.9		ug/m³ Air	2.18	2.00	60.5	101%	50 - 150	0.3	25	05/06/13 11:03	13E0024
Benzene	40.2		ug/m³ Air	1.28	2.00	35.4	113%	50 - 150	0.9	25	05/06/13 11:03	13E0024
Carbon tetrachloride	99.0		ug/m³ Air	2.52	2.00	76.5	129%	50 - 150	2	25	05/06/13 11:03	13E0024
n-Butanol	42.0		ug/m³ Air	1.21	2.00	36.9	114%	50 - 150	9	50	05/06/13 11:03	13E0024

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	Limit	Date Analyzed	QC Batch
Sample ID: 13E0024-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Cyclohexane	44.8		ug/m³ Air	1.38	2.00	38.9	115%	50 - 150	0.5	25	05/06/13 11:03	13E0024
1,2-Dichloropropane	64.8		ug/m³ Air	1.85	2.00	51.7	125%	50 - 150	1	25	05/06/13 11:03	13E0024
Bromodichloromethane	96.2		ug/m³ Air	2.68	2.00	75.7	127%	50 - 150	0.3	25	05/06/13 11:03	13E0024
Trichloroethene	59.5		ug/m³ Air	2.15	2.00	60.7	98%	50 - 150	0.02	25	05/06/13 11:03	13E0024
1,4-Dioxane	44.2		ug/m³ Air	1.44	2.00	40.7	109%	50 - 150	0.6	50	05/06/13 11:03	13E0024
2,2,4-Trimethylpentane	62.4		ug/m³ Air	1.87	2.00	52.3	119%	50 - 150	0.2	25	05/06/13 11:03	13E0024
Heptane	49.7		ug/m³ Air	1.64	2.00	46.8	106%	50 - 150	0.4	25	05/06/13 11:03	13E0024
cis-1,3-Dichloropropene	62.3		ug/m³ Air	1.82	2.00	51.8	120%	50 - 150	0.7	25	05/06/13 11:03	13E0024
4-Methyl-2-pentanone (MIBK)	55.1		ug/m³ Air	1.64	2.00	47.6	116%	50 - 150	1	25	05/06/13 11:03	13E0024
trans-1,3-Dichloropropene	60.8		ug/m³ Air	1.82	2.00	47.8	127%	50 - 150	2	25	05/06/13 11:03	13E0024
1,1,2-Trichloroethane	71.3		ug/m³ Air	2.18	2.00	61.7	116%	50 - 150	2	25	05/06/13 11:03	13E0024
Toluene	47.9		ug/m³ Air	1.51	2.00	42.6	113%	50 - 150	3	25	05/06/13 11:03	13E0024
2-Hexanone	65.0		ug/m³ Air	1.64	2.00	48.5	134%	50 - 150	0.4	25	05/06/13 11:03	13E0024
Chlorodibromomethane	127		ug/m³ Air	3.41	2.00	102	125%	50 - 150	1	25	05/06/13 11:03	13E0024
1,2-Dibromoethane (EDB)	99.9		ug/m³ Air	3.07	2.00	86.8	115%	50 - 150	2	25	05/06/13 11:03	13E0024
n-Octane	67.6		ug/m³ Air	1.87	2.00	52.3	129%	50 - 150	2	25	05/06/13 11:03	13E0024
Tetrachloroethene	78.2		ug/m³ Air	2.71	2.00	71.5	109%	50 - 150	1	25	05/06/13 11:03	13E0024
Chlorobenzene	58.9		ug/m³ Air	1.84	2.00	52.5	112%	50 - 150	2	25	05/06/13 11:03	13E0024
Ethylbenzene	57.9		ug/m³ Air	1.74	2.00	49.1	118%	50 - 150	3	25	05/06/13 11:03	13E0024
m-Xylene & p-Xylene	118		ug/m³ Air	3.47	2.00	96.3	123%	50 - 150	4	25	05/06/13 11:03	13E0024
Bromoform	**179**	**L1**	**ug/m³ Air**	**4.13**	**2.00**	**115**	**156%**	**50 - 150**	**1**	**25**	**05/06/13 11:03**	**13E0024**
Styrene	56.4		ug/m³ Air	1.70	2.00	48.6	116%	50 - 150	2	25	05/06/13 11:03	13E0024
1,1,2,2-Tetrachloroethane	102		ug/m³ Air	2.75	2.00	78.3	130%	50 - 150	2	25	05/06/13 11:03	13E0024
o-Xylene	59.4		ug/m³ Air	1.74	2.00	49.5	120%	50 - 150	4	25	05/06/13 11:03	13E0024
Xylenes, total	177		ug/m³ Air	5.21	2.00	146	122%	50 - 150	4	25	05/06/13 11:03	13E0024
n-Nonane	82.5		ug/m³ Air	2.10	2.00	58.1	142%	50 - 150	0.1	25	05/06/13 11:03	13E0024
Isopropylbenzene	64.3		ug/m³ Air	1.97	2.00	54.0	119%	50 - 150	3	50	05/06/13 11:03	13E0024
2 & 3-Chlorotoluene	73.2		ug/m³ Air	4.14	2.00	57.4	128%	50 - 150	2	25	05/06/13 11:03	13E0024
n-Propylbenzene	69.5		ug/m³ Air	1.97	2.00	53.4	130%	50 - 150	3	25	05/06/13 11:03	13E0024
4-Ethyltoluene	72.6		ug/m³ Air	1.97	2.00	57.1	127%	50 - 150	2	25	05/06/13 11:03	13E0024
1,3,5-Trimethylbenzene	66.4		ug/m³ Air	1.97	2.00	55.0	121%	50 - 150	4	25	05/06/13 11:03	13E0024
1,2,4-Trimethylbenzene	69.9		ug/m³ Air	1.97	2.00	54.0	130%	50 - 150	3	25	05/06/13 11:03	13E0024
tert-Butylbenzene	82.3		ug/m³ Air	2.20	2.00	60.3	137%	50 - 150	3	25	05/06/13 11:03	13E0024
Benzyl chloride	**126**	**L1**	**ug/m³ Air**	**2.07**	**2.00**	**59.1**	**214%**	**50 - 150**	**0.9**	**25**	**05/06/13 11:03**	**13E0024**
1,3-Dichlorobenzene	84.4		ug/m³ Air	2.40	2.00	68.6	123%	50 - 150	0.06	25	05/06/13 11:03	13E0024
n-Decane	88.7		ug/m³ Air	2.33	2.00	65.1	136%	50 - 150	0.4	25	05/06/13 11:03	13E0024

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Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	RPD Limit	Date Analyzed	QC Batch
Sample ID: 13E0024-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
1,4-Dichlorobenzene	85.0		ug/m³ Air	2.40	2.00	67.3	126%	50 - 150	0.3	25	05/06/13 11:03	13E0024
4-Isopropyltoluene	74.4		ug/m³ Air	2.20	2.00	59.7	125%	50 - 150	2	25	05/06/13 11:03	13E0024
1,2-Dichlorobenzene	82.9		ug/m³ Air	2.40	2.00	67.9	122%	50 - 150	0.4	25	05/06/13 11:03	13E0024
n-Butylbenzene	78.6		ug/m³ Air	2.20	2.00	59.7	132%	50 - 150	2	25	05/06/13 11:03	13E0024
n-Undecane	86.9		ug/m³ Air	2.56	2.00	70.8	123%	50 - 150	1	25	05/06/13 11:03	13E0024
1,2,4-Trichlorobenzene	108	B	ug/m³ Air	2.97	2.00	83.9	128%	50 - 150	3	25	05/06/13 11:03	13E0024
Naphthalene	66.2		ug/m³ Air	2.10	2.00	55.8	119%	50 - 150	1	25	05/06/13 11:03	13E0024
Hexachlorobutadiene	143		ug/m³ Air	4.27	2.00	119	119%	50 - 150	2	25	05/06/13 11:03	13E0024
1,2-Dichloroethene, Total	88.0		ug/m³ Air	3.17	2.00	88.7	99%	50 - 150	1	25	05/06/13 11:03	13E0024
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*92%*										05/06/13 11:03	13E0024
Surr: Fluorobenzene (46-118%)	*89%*										05/06/13 11:03	13E0024
Surr: Toluene-d8 (70-136%)	*100%*										05/06/13 11:03	13E0024
Surr: 1,4-Dichlorobutane (38-135%)	*113%*										05/06/13 11:03	13E0024
Surr: 4-Bromofluorobenzene (51-128%)	*108%*										05/06/13 11:03	13E0024
Sample ID: 13E0036-BSD1 (LCS Dup - Air)												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Propylene	19.4		ug/m³ Air	0.688	2.00	18.5	105%	50 - 150	4	25	05/09/13 11:33	13E0036
Chlorodifluoromethane	41.2		ug/m³ Air	1.41	2.00	38.1	108%	50 - 150	5	25	05/09/13 11:33	13E0036
Propane	20.3		ug/m³ Air	0.721	2.00	19.2	106%	50 - 150	6	25	05/09/13 11:33	13E0036
Dichlorodifluoromethane	50.9		ug/m³ Air	1.98	2.00	52.7	97%	50 - 150	6	25	05/09/13 11:33	13E0036
Chloromethane	23.9		ug/m³ Air	0.826	2.00	22.5	107%	50 - 150	6	25	05/09/13 11:33	13E0036
Isobutane	26.3		ug/m³ Air	0.951	2.00	25.3	104%	50 - 150	5	25	05/09/13 11:33	13E0036
1,2-Dichloro-1,1,2,2-tetrafluoroethane	58.6		ug/m³ Air	2.80	2.00	75.2	78%	50 - 150	6	25	05/09/13 11:33	13E0036
Vinyl chloride	26.7		ug/m³ Air	1.02	2.00	27.5	97%	50 - 150	6	25	05/09/13 11:33	13E0036
1-Butene/Isobutene	25.0		ug/m³ Air	0.918	2.00	24.2	103%	50 - 150	5	25	05/09/13 11:33	13E0036
1,3-Butadiene	26.4		ug/m³ Air	0.885	2.00	24.3	109%	50 - 150	6	25	05/09/13 11:33	13E0036
Butane	26.4		ug/m³ Air	0.951	2.00	25.3	104%	50 - 150	5	25	05/09/13 11:33	13E0036
Methanol	13.4	B	ug/m³ Air	0.524	2.00	14.4	93%	50 - 150	6	50	05/09/13 11:33	13E0036
trans-2-Butene	25.1		ug/m³ Air	0.918	2.00	24.0	105%	50 - 150	6	25	05/09/13 11:33	13E0036
Bromomethane	36.9		ug/m³ Air	1.55	2.00	41.4	89%	50 - 150	6	25	05/09/13 11:33	13E0036
cis-2-Butene	27.1		ug/m³ Air	0.918	2.00	25.9	105%	50 - 150	6	25	05/09/13 11:33	13E0036
Chloroethane	27.3		ug/m³ Air	1.06	2.00	27.8	98%	50 - 150	5	25	05/09/13 11:33	13E0036
Vinyl bromide	37.4		ug/m³ Air	1.75	2.00	47.6	79%	50 - 150	6	25	05/09/13 11:33	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	RPD Limit	Date Analyzed	QC Batch
Sample ID: 13E0036-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
3-Methyl-1-butene	32.8		ug/m³ Air	1.15	2.00	31.5	104%	50 - 150	5	25	05/09/13 11:33	13E0036
Acetonitrile	19.3		ug/m³ Air	0.672	2.00	17.7	109%	50 - 150	6	25	05/09/13 11:33	13E0036
Isopentane	32.6		ug/m³ Air	1.18	2.00	33.0	99%	50 - 150	7	25	05/09/13 11:33	13E0036
Trichlorofluoromethane	58.4		ug/m³ Air	2.25	2.00	62.9	93%	50 - 150	6	25	05/09/13 11:33	13E0036
1-Pentene	36.4		ug/m³ Air	1.15	2.00	33.3	109%	50 - 150	6	25	05/09/13 11:33	13E0036
Acetone	26.9	B	ug/m³ Air	0.950	2.00	26.6	101%	50 - 150	6	25	05/09/13 11:33	13E0036
Isopropyl alcohol	36.7		ug/m³ Air	0.983	2.00	29.9	123%	50 - 150	3	50	05/09/13 11:33	13E0036
Acrylonitrile	25.7		ug/m³ Air	0.868	2.00	24.3	106%	50 - 150	5	25	05/09/13 11:33	13E0036
n-Pentane	36.1		ug/m³ Air	1.18	2.00	33.0	109%	50 - 150	6	25	05/09/13 11:33	13E0036
Diethyl ether	34.1		ug/m³ Air	1.21	2.00	33.6	101%	50 - 150	5	25	05/09/13 11:33	13E0036
Isoprene	27.9		ug/m³ Air	1.11	2.00	30.9	90%	50 - 150	7	25	05/09/13 11:33	13E0036
trans-2-Pentene	31.6		ug/m³ Air	1.15	2.00	32.4	98%	50 - 150	6	25	05/09/13 11:33	13E0036
1,1-Dichloroethene	42.8		ug/m³ Air	1.59	2.00	44.8	95%	50 - 150	7	25	05/09/13 11:33	13E0036
cis-2-Pentene	32.0		ug/m³ Air	1.15	2.00	32.7	98%	50 - 150	6	25	05/09/13 11:33	13E0036
Methylene chloride	41.9		ug/m³ Air	1.39	2.00	38.1	110%	50 - 150	6	25	05/09/13 11:33	13E0036
2-Methyl-2-butene	32.1		ug/m³ Air	1.15	2.00	34.0	95%	50 - 150	6	25	05/09/13 11:33	13E0036
Carbon disulfide	23.7		ug/m³ Air	1.25	2.00	34.9	68%	50 - 150	6	25	05/09/13 11:33	13E0036
Allyl chloride	45.0		ug/m³ Air	1.25	2.00	34.4	131%	50 - 150	5	25	05/09/13 11:33	13E0036
1,1,2-Trichlorotrifluoroethane	71.3		ug/m³ Air	3.07	2.00	86.6	82%	50 - 150	5	25	05/09/13 11:33	13E0036
trans-1,2-Dichloroethene	41.9		ug/m³ Air	1.59	2.00	43.9	95%	50 - 150	11	25	05/09/13 11:33	13E0036
4-Methyl-1-pentene	45.6		ug/m³ Air	1.38	2.00	38.2	119%	50 - 150	7	25	05/09/13 11:33	13E0036
1,1-Dichloroethane	42.8		ug/m³ Air	1.62	2.00	44.9	95%	50 - 150	6	25	05/09/13 11:33	13E0036
Methyl tert-Butyl Ether	38.7		ug/m³ Air	1.44	2.00	40.3	96%	50 - 150	4	25	05/09/13 11:33	13E0036
Vinyl acetate	43.1		ug/m³ Air	1.41	2.00	40.5	106%	50 - 150	4	50	05/09/13 11:33	13E0036
2-Butanone (MEK)	33.3		ug/m³ Air	1.18	2.00	34.0	98%	50 - 150	4	25	05/09/13 11:33	13E0036
Chloroprene	38.1		ug/m³ Air	1.45	2.00	40.1	95%	50 - 150	5	25	05/09/13 11:33	13E0036
cis-1,2-Dichloroethene	43.1		ug/m³ Air	1.59	2.00	44.8	96%	50 - 150	6	25	05/09/13 11:33	13E0036
Hexane	36.6		ug/m³ Air	1.41	2.00	41.4	88%	50 - 150	5	25	05/09/13 11:33	13E0036
Chloroform	51.1		ug/m³ Air	1.95	2.00	53.1	96%	50 - 150	5	25	05/09/13 11:33	13E0036
trans-2-Hexene	38.0		ug/m³ Air	1.38	2.00	39.6	96%	50 - 150	5	25	05/09/13 11:33	13E0036
cis-2-Hexene	35.0		ug/m³ Air	1.38	2.00	37.8	93%	50 - 150	5	25	05/09/13 11:33	13E0036
1,2-Dichloroethane	46.6		ug/m³ Air	1.62	2.00	44.9	104%	50 - 150	5	25	05/09/13 11:33	13E0036
1,1,1-Trichloroethane	59.4		ug/m³ Air	2.18	2.00	60.5	98%	50 - 150	6	25	05/09/13 11:33	13E0036
Benzene	39.7		ug/m³ Air	1.28	2.00	35.4	112%	50 - 150	7	25	05/09/13 11:33	13E0036
Carbon tetrachloride	99.7		ug/m³ Air	2.52	2.00	76.5	130%	50 - 150	8	25	05/09/13 11:33	13E0036
n-Butanol	39.3		ug/m³ Air	1.21	2.00	36.9	107%	50 - 150	1	50	05/09/13 11:33	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	RPD Limit	Date Analyzed	QC Batch
Sample ID: 13E0036-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
Cyclohexane	44.3		ug/m³ Air	1.38	2.00	38.9	114%	50 - 150	8	25	05/09/13 11:33	13E0036
1,2-Dichloropropane	64.5		ug/m³ Air	1.85	2.00	51.7	125%	50 - 150	7	25	05/09/13 11:33	13E0036
Bromodichloromethane	94.8		ug/m³ Air	2.68	2.00	75.7	125%	50 - 150	8	25	05/09/13 11:33	13E0036
Trichloroethene	58.0		ug/m³ Air	2.15	2.00	60.7	95%	50 - 150	8	25	05/09/13 11:33	13E0036
1,4-Dioxane	42.5		ug/m³ Air	1.44	2.00	40.7	104%	50 - 150	7	50	05/09/13 11:33	13E0036
2,2,4-Trimethylpentane	61.4		ug/m³ Air	1.87	2.00	52.3	117%	50 - 150	8	25	05/09/13 11:33	13E0036
Heptane	49.5		ug/m³ Air	1.64	2.00	46.8	106%	50 - 150	7	25	05/09/13 11:33	13E0036
cis-1,3-Dichloropropene	61.6		ug/m³ Air	1.82	2.00	51.8	119%	50 - 150	8	25	05/09/13 11:33	13E0036
4-Methyl-2-pentanone (MIBK)	55.7		ug/m³ Air	1.64	2.00	47.6	117%	50 - 150	9	25	05/09/13 11:33	13E0036
trans-1,3-Dichloropropene	60.7		ug/m³ Air	1.82	2.00	47.8	127%	50 - 150	8	25	05/09/13 11:33	13E0036
1,1,2-Trichloroethane	71.2		ug/m³ Air	2.18	2.00	61.7	115%	50 - 150	7	25	05/09/13 11:33	13E0036
Toluene	48.1		ug/m³ Air	1.51	2.00	42.6	113%	50 - 150	7	25	05/09/13 11:33	13E0036
2-Hexanone	65.9		ug/m³ Air	1.64	2.00	48.5	136%	50 - 150	7	25	05/09/13 11:33	13E0036
Chlorodibromomethane	125		ug/m³ Air	3.41	2.00	102	123%	50 - 150	8	25	05/09/13 11:33	13E0036
1,2-Dibromoethane (EDB)	98.5		ug/m³ Air	3.07	2.00	86.8	113%	50 - 150	7	25	05/09/13 11:33	13E0036
n-Octane	67.9		ug/m³ Air	1.87	2.00	52.3	130%	50 - 150	8	25	05/09/13 11:33	13E0036
Tetrachloroethene	77.4		ug/m³ Air	2.71	2.00	71.5	108%	50 - 150	7	25	05/09/13 11:33	13E0036
Chlorobenzene	58.3		ug/m³ Air	1.84	2.00	52.5	111%	50 - 150	7	25	05/09/13 11:33	13E0036
Ethylbenzene	58.2		ug/m³ Air	1.74	2.00	49.1	119%	50 - 150	6	25	05/09/13 11:33	13E0036
m-Xylene & p-Xylene	119		ug/m³ Air	3.47	2.00	96.3	123%	50 - 150	6	25	05/09/13 11:33	13E0036
Bromoform	**174**	**L1**	**ug/m³ Air**	**4.13**	**2.00**	**115**	**152%**	**50 - 150**	**7**	**25**	**05/09/13 11:33**	**13E0036**
Styrene	56.3		ug/m³ Air	1.70	2.00	48.6	116%	50 - 150	6	25	05/09/13 11:33	13E0036
1,1,2,2-Tetrachloroethane	100		ug/m³ Air	2.75	2.00	78.3	128%	50 - 150	7	25	05/09/13 11:33	13E0036
o-Xylene	60.1		ug/m³ Air	1.74	2.00	49.5	121%	50 - 150	6	25	05/09/13 11:33	13E0036
Xylenes, total	179		ug/m³ Air	5.21	2.00	146	123%	50 - 150	6	25	05/09/13 11:33	13E0036
n-Nonane	82.0		ug/m³ Air	2.10	2.00	58.1	141%	50 - 150	7	25	05/09/13 11:33	13E0036
Isopropylbenzene	64.1		ug/m³ Air	1.97	2.00	54.0	119%	50 - 150	6	50	05/09/13 11:33	13E0036
2 & 3-Chlorotoluene	72.7		ug/m³ Air	4.14	2.00	57.4	127%	50 - 150	6	25	05/09/13 11:33	13E0036
n-Propylbenzene	69.0		ug/m³ Air	1.97	2.00	53.4	129%	50 - 150	6	25	05/09/13 11:33	13E0036
4-Ethyltoluene	71.9		ug/m³ Air	1.97	2.00	57.1	126%	50 - 150	6	25	05/09/13 11:33	13E0036
1,3,5-Trimethylbenzene	66.7		ug/m³ Air	1.97	2.00	55.0	121%	50 - 150	6	25	05/09/13 11:33	13E0036
1,2,4-Trimethylbenzene	69.4		ug/m³ Air	1.97	2.00	54.0	129%	50 - 150	6	25	05/09/13 11:33	13E0036
tert-Butylbenzene	81.9		ug/m³ Air	2.20	2.00	60.3	136%	50 - 150	7	25	05/09/13 11:33	13E0036
Benzyl chloride	**124**	**L1**	**ug/m³ Air**	**2.07**	**2.00**	**59.1**	**210%**	**50 - 150**	**5**	**25**	**05/09/13 11:33**	**13E0036**
1,3-Dichlorobenzene	81.7		ug/m³ Air	2.40	2.00	68.6	119%	50 - 150	7	25	05/09/13 11:33	13E0036
n-Decane	88.3		ug/m³ Air	2.33	2.00	65.1	136%	50 - 150	7	25	05/09/13 11:33	13E0036

Golder Associates Ltd.
500-4260 Still Creek Drive
Burnaby, British Columbia, CANADA V5C6C6
Julie Burghardt

Work Order: AWD0187
Project: AENV Canada Creosote
Project Number: 11-1324-0164

Received: 04/29/13 08:15
Reported: 05/16/13 06:57

PROJECT QUALITY CONTROL DATA

LCS Dup - Cont.

Analyte	Result	Data Qualifiers	Units	RL	Dilution	Spike Conc	% Rec	Target Range	RPD	RPD Limit	Date Analyzed	QC Batch
Sample ID: 13E0036-BSD1 (LCS Dup - Air) - cont.												
EPA TO15 - Volatile Organic Compounds by GC/MS												
1,4-Dichlorobenzene	82.2		ug/m³ Air	2.40	2.00	67.3	122%	50 - 150	6	25	05/09/13 11:33	13E0036
4-Isopropyltoluene	74.3		ug/m³ Air	2.20	2.00	59.7	124%	50 - 150	5	25	05/09/13 11:33	13E0036
1,2-Dichlorobenzene	80.0		ug/m³ Air	2.40	2.00	67.9	118%	50 - 150	6	25	05/09/13 11:33	13E0036
n-Butylbenzene	77.9		ug/m³ Air	2.20	2.00	59.7	131%	50 - 150	5	25	05/09/13 11:33	13E0036
n-Undecane	87.0		ug/m³ Air	2.56	2.00	70.8	123%	50 - 150	6	25	05/09/13 11:33	13E0036
1,2,4-Trichlorobenzene	108	B	ug/m³ Air	2.97	2.00	83.9	129%	50 - 150	3	25	05/09/13 11:33	13E0036
Naphthalene	66.8	B	ug/m³ Air	2.10	2.00	55.8	120%	50 - 150	4	25	05/09/13 11:33	13E0036
Hexachlorobutadiene	141	B	ug/m³ Air	4.27	2.00	119	118%	50 - 150	4	25	05/09/13 11:33	13E0036
1,2-Dichloroethene, Total	84.9		ug/m³ Air	3.17	2.00	88.7	96%	50 - 150	8	25	05/09/13 11:33	13E0036
Surr: 2-Bromo-1,1,1-trifluoroethane (58-131%)	*90%*										05/09/13 11:33	13E0036
Surr: Fluorobenzene (46-118%)	*85%*										05/09/13 11:33	13E0036
Surr: Toluene-d8 (70-136%)	*100%*										05/09/13 11:33	13E0036
Surr: 1,4-Dichlorobutane (38-135%)	*112%*										05/09/13 11:33	13E0036
Surr: 4-Bromofluorobenzene (51-128%)	*107%*										05/09/13 11:33	13E0036

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
14050 Summit Drive, Suite A100 Austin, TX 78728 * 512-244-0855 * Fax 512-244-0160

Golder Associates Ltd.	Work Order:	AWD0187	Received: 04/29/13 08:15
500-4260 Still Creek Drive			Reported: 05/16/13 06:57
Burnaby, British Columbia, CANADA V5C6C6	Project:	AENV Canada Creosote	
Julie Burghardt	Project Number:	11-1324-0164	

DATA QUALIFIERS AND DEFINITIONS

B	Analyte was detected in the associated Method Blank.
C4	Calibration Verification recovery was below the method control limit for this analyte.
C8	Calibration Verification recovery was above the method control limit for this analyte. A high bias may be indicated.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
L1	Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was above acceptance limits.
R4	Due to the low levels of analyte in the sample, the duplicate RPD calculation does not provide useful information.
RA	Results are from a second analysis of the sample.
U	Result less than sample specific method detection limit
ND	Not detected.

TestAmerica – Austin Laboratory Chain of Custody Addendum **Work Order Number** AWP0187

RECEIVED BY: RL. CLIENT: Golder Associates

DATE/TIME RECEIVED: 4/29/13 0815 PROJECT: AENV Canada Creosote

UNPACKED DATE/TIME: 4/29/13 1145 LOGIN BY: BA LOGIN REVIEWED BY: JNS

Number of Shipping Containers Received with COC: 1

VOC SAMPLES: ☑ YES **(IF YES, GO TO SECTIONS 1.0, 2.0, 6.0, & 7.0)**

1.0 CONTAINERS EXAMINED UPON RECEIPT: RL.

Container Sealed: ☑ YES ☐ NO Custody Seal Present: ☐ YES ☑ NO Custody Seal Signed/Dated: ☐ YES ☑ NO

If seal not intact list air bill number of that container(s): _____

2.0 VOC CANISTERS EXAMINED UPON RECEIPT: RL.

Canister Valves Closed: ☑ YES ☐ NO Canister Valves Capped: ☑ YES ☐ NO

Sample IDs match COC: ☑ YES ☐ NO Other Equipment Received: ☑ YES ☐ NO

Valve Cap Tightened Properly: ☑ YES ☐ NO Can Size: ☑ 6L ☐ 1L Other: _____

Packing Material Used: (circle) None / Absorbent / Paper / Bubble Wrap 4- Flow Cont. 1- Dup Flow Cont/gauge. 1- Dup can.

Samples received in Tedlar bags ☐ N/A ☐ YES ☑ NO

3.0 CONDITION OF BOTTLES/CONTAINERS **VERIFIED BY:** _____

Sample IDs match COC: ☐ YES ☐ NO Bottles received intact: ☐ YES ☐ NO

See additional discrepancies/comments section: ☐ YES ☐ NO Samples received from USDA restricted area: ☐ YES ☐ NO

Chain-of-Custody form properly maintained: ☐ YES ☐ NO VOA trip blanks included: ☐ N/A ☐ YES ☐ NO

4.0 SAMPLE TEMPERATURE UPON RECEIPT BY: _____ **IR THERMOMETER #:** ☐ P5 ☐ P7

Container(s) temperature: TB = Temp. Blank and/or SC = Sample Container CF = Correction Factor *[acceptable tolerance ≤6°C]*

TB ☐ SC ☐ Initial	TB ☐ SC ☐ Initial	TB ☐ SC ☐ Initial	TB ☐ SC ☐ Initial	TB ☐ SC ☐ Initial	TB ☐ SC ☐ Initial	TB ☐ SC ☐ Initial	TB ☐ SC ☐ Initial
CF	CF	CF	CF	CF	CF	CF	CF
Final	Final	Final	Final	Final	Final	Final	Final

If temperature is outside acceptable tolerance, Project Manager was notified (_____PM). Date: _____ Time: _____

Samples received do not require cooling _____ OK to analyze samples: ☐ YES ☐ NO

5.0 PRESERVATION CHECKS

PRESERVATION OF SAMPLES REQUIRED: ☐ N/A ☐ YES ☐ VOA Samples **VERIFIED BY:** _____

NOTE: pH CHECK OF SAMPLES PERFORMED AT TIME OF ANALYSIS BY BENCH ANALYST

pH CHECK OF VOLATILE SAMPLES PERFORMED AFTER ANALYSIS BY THE BENCH ANALYST.

Cyanide samples checked for sulfides: ☐ YES ☐ NO

Sulfide samples appear to be preserved with zinc acetate: ☐ YES ☐ NO

Chlorine checked per specification (EPA 335.x & N.C.) ☐ YES ☐ NO Free chlorine present: ☐ YES ☐ NO

If preservation is outside acceptable limit, PM notified (_____PM) Date/Time: _____

Volatile samples filled completely: ☐ YES ☐ NO [if no, list ID and approx. amt. of headspace (>6mm) in Comments Section 7.0]

6.0 SHIPPING DOCUMENTATION:

Air/freight bill is available and attached to COC: ☑ YES ☐ NO Air bill #: _____

Hand-delivered Carrier: _____ Date: _____ Time: _____

7.0 OTHER COMMENTS:

Samples. MW 10-6 well A + B & MW 10-15 well. Flow Cont ID + Can ID. Switched on COC.

- COC - No time reling.

- Can RA 2390 - Can tag date 4/27/13 COC. 4/25/13

8.0 CORRECTIVE ACTION:

Client's Name: _____ Informed verbally on: _____ By: _____

Client's Name: _____ Informed verbally on: _____ By: _____

Sample(s) processed "as is" comments: _____

Samples(s) on hold until: _____ If released, notify: _____

Project Management Login Review: Neal Golder Date: 4/30/13

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE Revised 07/26/11

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Canister Samples Chain of Custody Record

AWD0187

TestAmerica Austin
14050 Summit Dr.
Suite A-100
Austin, TX 78728
phone: 512-244-0855 fax: 512-244-0160

Client Contact Information	**Project Manager:** Julie Burghardt		1 of 1 COCs
Company: Golder Associates	**Phone:** 1-403-299-5600	**Samples Collected By:** NB	
Address: 102-2535 3rd Ave SW	**Email:** jburghardt@golder.com nbaumann@golder.com		
City/State/Zip Calgary AB, Canada T2A 7W5	**Site Contact:**		
Phone: 1-403-299-5600	**LAB Contact:** Carl Skelly		
FAX:	**Analysis Turnaround Time**		
Project Name: Canada Creosote	(Standard) (Specify) _____		
Site:	Rush (Specity) _____		
PO # 11-1324-0164			

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, Hg (Stop)	Flow Controller ID	Canister ID	TO-15 PIANO	TO-14A	TO-3	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
MW10-11 Well	April 24/13	12:03	13:03	29	4	A023	RA0868	X										X		
MW10-16 Well	"	14:55	15:48	26	4	7298375	RA2143	X										X		
MW10-7B Deep Probe	"	16:16	17:16	30	4.5	A016	RA2203	X										X		
MW10-6 Well A	April 25/13	10:08	10:38	26	10	HL0852	00001	X										X		
MW10-6 Well B	"	"	"	"	"	RA2390	"	X										X		
MW10-15 Well	"	13:16	14:13	25	3	RA2252	A014	X										X		

Special Instructions/QC Requirements & Comments:

Samples Shipped by: Niki Baumann	Date/Time: April 25/13	Samples Received by: [illegible] 4/29/13 0815
Samples Relinquished by:	Date/Time:	Received by:
Relinquished by:	Date/Time:	Received by:

TAL-4143 (0608)

Lab Use Only **Shipper Name:** **Opened by:** **Condition:**

Success Through Science®

Your Project #: 11-1324-0164
Site Location: CANADA CREOSOTE
Your C.O.C. #: A221726

Attention: Julie Burghardt
GOLDER ASSOCIATES LTD.
CALGARY - NATIONAL CONTRACT
102, 2535 - 3rd Avenue SE
CALGARY, AB
CANADA T2A 7W5

Report Date: 2013/05/03

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B332409
Received: 2013/04/25, 15:43

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS	1	N/A	2013/04/29	AB SOP-00039	CCME, EPA 8260C
Total Cresols Calculation	1	N/A	2013/04/30	CAL SOP-00164	EPA 8270D
CCME Hydrocarbons (F2-F4 in water)	1	2013/04/29	2013/04/30	AB SOP-00040 AB SOP-00037	EPA3510C/CCME PHCCWS
Benzo[a]pyrene Equivalency	1	N/A	2013/05/03	AB SOP-00003	EPA 8270D
PAH in Water by GC/MS (1)	1	2013/04/26	2013/05/03	AB SOP-00003 AB SOP-00037	EPA 3510C/8270D
Phenols (semivolatile)	1	2013/04/26	2013/04/30	CAL SOP-00164	EPA 3510C, EPA 8270D

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

Encryption Key

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

Anna Gordon, Project Manager
Email: AGordon@maxxam.ca
Phone# (403) 291-3077

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

Total cover pages: 1

Maxxam Job #: B332409
Report Date: 2013/05/03

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164
Site Location: CANADA CREOSOTE
Sampler Initials: NB

AT1 BTEX AND F1-F4 IN WATER (WATER)

Maxxam ID		GF7168		
Sampling Date		2013/04/25 11:00		
	UNITS	**MW10-6 WELL**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	3600(1)	10	6774319
F3 (C16-C34 Hydrocarbons)	mg/L	3400(1)	4.0	6774319
F4 (C34-C50 Hydrocarbons)	mg/L	510(1)	4.0	6774319
Reached Baseline at C50	mg/L	NO		6774319
Surrogate Recovery (%)				
O-TERPHENYL (sur.)	%	305(2)		6774319
Volatiles				
Benzene	mg/L	0.0012	0.00040	6773050
Toluene	mg/L	0.12	0.00040	6773050
Ethylbenzene	mg/L	0.53	0.00040	6773050
m & p-Xylene	mg/L	1.7	0.00080	6773050
o-Xylene	mg/L	0.87	0.00040	6773050
Xylenes (Total)	mg/L	2.6	0.00080	6773050
F1 (C6-C10) - BTEX	mg/L	8.8	0.10	6773050
(C6-C10)	mg/L	12	0.10	6773050
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	122		6773050
4-BROMOFLUOROBENZENE (sur.)	%	116		6773050
D4-1,2-DICHLOROETHANE (sur.)	%	117		6773050

RDL = Reportable Detection Limit
(1) - Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) - Surrogate recovery exceeds acceptance criteria due to matrix interference.

Maxxam Job #: B332409
Report Date: 2013/05/03

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164
Site Location: CANADA CREOSOTE
Sampler Initials: NB

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		GF7168		
Sampling Date		2013/04/25 11:00		
	UNITS	**MW10-6 WELL**	**RDL**	**QC Batch**
Polycyclic Aromatics				
Benzo[a]pyrene equivalency	ug/L	12000	0.010	6770457
Acenaphthene	mg/L	39	1.0	6774354
Acenaphthylene	mg/L	1.4	1.0	6774354
Acridine	mg/L	<2.0	2.0	6774354
Anthracene	mg/L	17	0.10	6774354
Benzo(a)anthracene	mg/L	<15 (1)	15	6774354
Benzo(b&j)fluoranthene	mg/L	13	0.085	6774354
Benzo(k)fluoranthene	mg/L	4.3	0.085	6774354
Benzo(g,h,i)perylene	mg/L	2.5	0.085	6774354
Benzo(c)phenanthrene	mg/L	2.3	0.50	6774354
Benzo(a)pyrene	mg/L	8.1	0.075	6774354
Benzo[e]pyrene	mg/L	6.1	0.50	6774354
Chrysene	mg/L	11	0.085	6774354
Dibenz(a,h)anthracene	mg/L	0.82	0.075	6774354
Fluoranthene	mg/L	52	0.40	6774354
Fluorene	mg/L	33	0.50	6774354
Indeno(1,2,3-cd)pyrene	mg/L	3.0	0.085	6774354
2-Methylnaphthalene	mg/L	57	1.0	6774354
Naphthalene	mg/L	200	1.0	6774354
Phenanthrene	mg/L	86	0.50	6774354
Perylene	mg/L	1.8	0.50	6774354
Pyrene	mg/L	37	0.20	6774354
Quinoline	mg/L	<2.0	2.0	6774354

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

Maxxam Job #: B332409
Report Date: 2013/05/03

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164
Site Location: CANADA CREOSOTE
Sampler Initials: NB

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		GF7168		
Sampling Date		2013/04/25 11:00		
	UNITS	**MW10-6 WELL**	**RDL**	**QC Batch**
Phenols				
2,3,4-trichlorophenol	mg/L	<0.048	0.048	6771190
Cresols	mg/L	<0.13	0.13	6771200
Phenol	mg/L	<0.048	0.048	6771190
3 & 4-chlorophenol	mg/L	<9.7(1)	9.7	6771190
2,3,5,6-tetrachlorophenol	mg/L	<0.048	0.048	6771190
2,3,4,6-tetrachlorophenol	mg/L	<0.048	0.048	6771190
2,4,5-trichlorophenol	mg/L	<0.048	0.048	6771190
2,4,6-trichlorophenol	mg/L	<0.048	0.048	6771190
2,3,5-trichlorophenol	mg/L	<0.048	0.048	6771190
2,4-dichlorophenol	mg/L	<0.17(1)	0.17	6771190
2,4-dimethylphenol	mg/L	<0.56(1)	0.56	6771190
2,4-dinitrophenol	mg/L	<0.48	0.48	6771190
2,6-dichlorophenol	mg/L	<0.048	0.048	6771190
2-chlorophenol	mg/L	<0.048	0.048	6771190
2-methylphenol	mg/L	<0.048	0.048	6771190
2-nitrophenol	mg/L	<0.48	0.48	6771190
3 & 4-methylphenol	mg/L	<0.13(1)	0.13	6771190
4,6-dinitro-2-methylphenol	mg/L	<0.48	0.48	6771190
4-chloro-3-methylphenol	mg/L	<0.048	0.048	6771190
4-nitrophenol	mg/L	<3.4(1)	3.4	6771190
Pentachlorophenol	mg/L	<0.048	0.048	6771190

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

Maxxam Job #: B332409
Report Date: 2013/05/03

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164
Site Location: CANADA CREOSOTE
Sampler Initials: NB

Package 1	4.3°C

Each temperature is the average of up to three cooler temperatures taken at receipt

SEMIVOLATILE ORGANICS BY GC-MS (WATER) Comments

Sample GF7168-03 PAH in Water by GC/MS: Surrogate recovery not reported due to dilution caused by matrix interference.Detection limits raised due to sample matrix.

Sample GF7168-04 Phenols (semivolatile): Detection limits raised due to matrix interference. Surrogate not reported due to matrix interference.

Maxxam Job #: B332409
Report Date: 2013/05/03

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164
Site Location: CANADA CREOSOTE
Sampler Initials: NB

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6771190	Phenol	2013/04/30			37	30 - 130	<0.00010	mg/L		
6771190	2,3,5,6-tetrachlorophenol	2013/04/30			80	30 - 130	<0.00010	mg/L		
6771190	2,3,4,6-tetrachlorophenol	2013/04/30			82	30 - 130	<0.00010	mg/L		
6771190	2,4,5-trichlorophenol	2013/04/30			49	30 - 130	<0.00010	mg/L		
6771190	2,4,6-trichlorophenol	2013/04/30			82	30 - 130	<0.00010	mg/L		
6771190	2,4-dichlorophenol	2013/04/30			76	30 - 130	<0.00010	mg/L		
6771190	2,4-dimethylphenol	2013/04/30			69	30 - 130	<0.00010	mg/L		
6771190	2,4-dinitrophenol	2013/04/30			25 (1)	30 - 130	<0.0010	mg/L		
6771190	2,6-dichlorophenol	2013/04/30			95	30 - 130	<0.00010	mg/L		
6771190	2-chlorophenol	2013/04/30			72	30 - 130	<0.00010	mg/L		
6771190	2-methylphenol	2013/04/30			54	30 - 130	<0.00010	mg/L		
6771190	2-nitrophenol	2013/04/30			78	30 - 130	<0.0010	mg/L		
6771190	3 & 4-methylphenol	2013/04/30			51	30 - 130	<0.00010	mg/L		
6771190	4,6-dinitro-2-methylphenol	2013/04/30			32	30 - 130	<0.0010	mg/L		
6771190	4-chloro-3-methylphenol	2013/04/30			72	30 - 130	<0.00010	mg/L		
6771190	4-nitrophenol	2013/04/30			53	30 - 130	<0.0010	mg/L		
6771190	Pentachlorophenol	2013/04/30			67	30 - 130	<0.00010	mg/L		
6771190	2,3,4-trichlorophenol	2013/04/30					<0.00010	mg/L		
6771190	3 & 4-chlorophenol	2013/04/30					<0.00010	mg/L		
6771190	2,3,5-trichlorophenol	2013/04/30					<0.00010	mg/L		
6773050	1,4-Difluorobenzene (sur.)	2013/04/27	109	70 - 130	107	70 - 130	101	%		
6773050	4-BROMOFLUOROBENZENE (sur.)	2013/04/27	105	70 - 130	107	70 - 130	101	%		
6773050	D4-1,2-DICHLOROETHANE (sur.)	2013/04/27	100	70 - 130	100	70 - 130	102	%		
6773050	Benzene	2013/04/27	84	70 - 130	80	70 - 130	<0.00040	mg/L	NC	40
6773050	Toluene	2013/04/27	100	70 - 130	94	70 - 130	<0.00040	mg/L	NC	40
6773050	Ethylbenzene	2013/04/27	87	70 - 130	82	70 - 130	<0.00040	mg/L	NC	40
6773050	m & p-Xylene	2013/04/27	88	70 - 130	84	70 - 130	<0.00080	mg/L	NC	40
6773050	o-Xylene	2013/04/27	98	70 - 130	85	70 - 130	<0.00040	mg/L	NC	40
6773050	(C6-C10)	2013/04/27	93	70 - 130	104	70 - 130	<0.10	mg/L	NC	40
6773050	Xylenes (Total)	2013/04/27					<0.00080	mg/L	NC	40
6773050	F1 (C6-C10) - BTEX	2013/04/27					<0.10	mg/L	NC	40
6774319	O-TERPHENYL (sur.)	2013/04/29	92	50 - 130	87	50 - 130	89	%		
6774319	F2 (C10-C16 Hydrocarbons)	2013/04/29	91	50 - 130	82	70 - 130	<0.10	mg/L	NC	40
6774319	F3 (C16-C34 Hydrocarbons)	2013/04/29	127	50 - 130	91	70 - 130	<0.20	mg/L	NC	40
6774319	F4 (C34-C50 Hydrocarbons)	2013/04/29	115	50 - 130	113	70 - 130	<0.20	mg/L	NC	40
6774354	Acenaphthene	2013/05/03	129	50 - 130	109	50 - 130	<0.00010	mg/L	NC	40
6774354	Acenaphthylene	2013/05/03	113	50 - 130	108	50 - 130	<0.00010	mg/L	NC	40
6774354	Acridine	2013/05/03	114	50 - 130	92	50 - 130	<0.00020	mg/L	NC	40
6774354	Anthracene	2013/05/03	120	50 - 130	103	50 - 130	<0.000010	mg/L	NC (2)	40
6774354	Benzo(a)anthracene	2013/05/03	130	50 - 130	101	50 - 130	<0.0000085	mg/L	NC	40

Maxxam Job #: B332409
Report Date: 2013/05/03

GOLDER ASSOCIATES LTD.
Client Project #: 11-1324-0164
Site Location: CANADA CREOSOTE
Sampler Initials: NB

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6774354	Benzo(b&j)fluoranthene	2013/05/03	129	50 - 130	95	50 - 130	<0.0000085	mg/L	9.2	40
6774354	Benzo(k)fluoranthene	2013/05/03	126	50 - 130	104	50 - 130	<0.0000085	mg/L	NC	40
6774354	Benzo(g,h,i)perylene	2013/05/03	109	50 - 130	77	50 - 130	<0.0000085	mg/L	NC	40
6774354	Benzo(c)phenanthrene	2013/05/03	131(1)	50 - 130	110	50 - 130	<0.000050	mg/L	NC	40
6774354	Benzo(a)pyrene	2013/05/03	126	50 - 130	92	50 - 130	<0.0000075	mg/L	23.6	40
6774354	Benzo[e]pyrene	2013/05/03	139(1)	50 - 130	104	50 - 130	<0.000050	mg/L	10.9	40
6774354	Chrysene	2013/05/03	118	50 - 130	97	50 - 130	<0.0000085	mg/L	NC	40
6774354	Dibenz(a,h)anthracene	2013/05/03	110	50 - 130	69	50 - 130	<0.0000075	mg/L	NC	40
6774354	Fluoranthene	2013/05/03	126	50 - 130	105	50 - 130	<0.000040	mg/L	NC	40
6774354	Fluorene	2013/05/03	129	50 - 130	107	50 - 130	<0.000050	mg/L	NC	40
6774354	Indeno(1,2,3-cd)pyrene	2013/05/03	108	50 - 130	72	50 - 130	<0.0000085	mg/L	34.6	40
6774354	2-Methylnaphthalene	2013/05/03	107	50 - 130	100	50 - 130	<0.00010	mg/L	NC	40
6774354	Naphthalene	2013/05/03	114	50 - 130	109	50 - 130	<0.00010	mg/L	NC	40
6774354	Phenanthrene	2013/05/03	128	50 - 130	109	50 - 130	<0.000050	mg/L	NC	40
6774354	Perylene	2013/05/03	114	50 - 130	93	50 - 130	<0.000050	mg/L	5.1	40
6774354	Pyrene	2013/05/03	NC	50 - 130	108	50 - 130	<0.000020	mg/L	6.5	40
6774354	Quinoline	2013/05/03	108	50 - 130	108	50 - 130	<0.00020	mg/L	NC	40

N/A = Not Applicable
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
(2) - Detection limits raised due to matrix interference.

Validation Signature Page

Maxxam Job #: B332409

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

Luba Shymushovska, Senior Analyst, Organic Department

Veronica Falk, Scientific Specialist

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Maxxam

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247
Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 577-7100, Fax: (780) 450-4187, Toll free: (877) 465-8889
www.maxxamanalytics.com

Chain of Custody

A221726

Page: 1 of 1

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☒	Report Distribution (E-Mail):
Company:	Golder Associates		jburghardt@golder.com
Contact:	Julie Burghardt		nbaumann@golder.com
Address:	102 - 2535 3rd Ave SW		
	Prov: AB PC: T2A 7W5	Prov: PC:	
Contact #s:	Ph: 403-299-5600 Cell:	Ph: Cell:	

REGULATORY GUIDELINES:
- ☒ AT1
- ☒ CCME
- ☐ Regulated Drinking Water
- ☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:	
Project # / Name:	11-1324-0164
Site Location:	Canada Creosote
Quote #:	
Sampled By:	NB

SERVICE REQUESTED:
- ☐ RUSH (Contact lab to reserve) Date Required:
- ☒ REGULAR (5 to 7 Days)

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: BTEX F1-F4	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals	Basic Class II Landfill	WATER: ☐BTEX F1	☐BTEX F1-F2	☒BTEX F1-F4	☐ Routine Water ☐ Turb ☐ F	☐ TOC ☐ DOC	Total	Dissolved	Mercury	☐ Total ☐ Dissolved	Regulated Metals (CCME / AT1)	Other Analysis: PAH	SVPhen	Creosols	HOLD - Do not Analyze	# of Containers Submitted
1	MW10-6 Well		GW	13/04/25 11:00									X								X	X	X		
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

25-Apr-13 15:43
Anna Gordon
B332409
ACF INS-0001

Please indicate Filtered, Preserved or Both (F, P, F/P) → F/P

Relinquished By (Signature/Print): Niki Baumann	Date (YY/MM/DD): 13/04/25	Time (24:00): 15:40
Relinquished By (Signature/Print): HIGH Conc. Expected!	Date (YY/MM/DD):	Time (24:00):

Special Instructions: -High Concentration of Contaminants expected - DNAPL
-2 of the 250ml ambers do NOT have preservative in them as noted on the table.
→ Use 1L amber last, take SVPhen from other bottles, if possible

# of Jars Used & Not Submitted:

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #:			
Jason B JASON BIL	13/04/25	15:43	Custody Seal	Temperature		Ice
Lab Comments: 04-758			No	5, 4, 4		Yes

APPENDIX C

Additional Soil Vapour Data

Sample Location ID			MW10-1					MW10-2	MW10-3B							MW10-5			MW10-6							
LAB ID			R103247-01		AUC0212-03	R103247-02	2110724-01	R103247-03	R103247-04	2110724-03	R103247-05	2110724-04	R103247-06	2110724-02	R103247-07	R103247-08	2110724-05	R103247-09		AUC0212-04	2110724-06	3041469-05		AVK0120-01	AWD0187-04	AWD0187-05
SAMPLE METHOD			Well		Well	Deep probe	Deep probe	Well	Shallow probe	Shallow probe	Deep probe	Deep probe	Well	Well	Well	Deep probe	Deep probe	Deep probe		Well	Well	Well		Well	Well	Well
SAMPLE DEPTH (mbgs)			2.7-3.3		2.7-3.3	2.4-2.55	2.4-2.55	2.5-3.1	0.81-1.37	0.81-1.37	1.68-2.13	1.68-2.13	2.74-3.00	2.74-3.00	2.13-3.9	1.07-1.52	1.07-1.52	1.65-2.44		3.04-3.42	3.04-3.71	3.04-3.15		3.04-3.71	3.04-3.15	3.04-3.15
DATE SAMPLED			09-Mar-11		09-Mar-11	09-Mar-11	10-Nov-12	09-Mar-11	09-Mar-11	10-Nov-12	09-Mar-11	10-Nov-12	09-Mar-11	10-Nov-12	11-Mar-11	11-Mar-11	10-Nov-12	10-Mar-11		10-Mar-11	10-Nov-12	25-Apr-13		12-Nov-12	25-Apr-13	25-Apr-13
LABORATORY			CARO		Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO		Test America	CARO	CARO		Test America	Test America	Test america (DUP)
MATRIX	CARO RDL 2011	CARO RDL 2012	Air	Test America MDL 2011	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Test America MDL	Air	Air	Air	Test America MDL	Air	Air	Air
Hydrocarbons																										
nC5-nC8 (total)	150	140	470	-	-	710	<160	220	390	<170	570	<170	750	190	1700	1400	<160	550	-	-	370	<17000	-	-	-	-
nC5-nC8 (aromatic)	3.1	2.9	24	-	-	96	<3.3	4.3	24	<3.3	84	<3.3	69	6	360	280	<3.2	81	-	-	9.9	110	-	-	-	-
nC5-nC8 (aliphatic)	150	140	470	-	-	610	<160	210	360	<170	510	<170	650	190	1300	1100	<160	480	-	-	340	<17000	-	-	-	-
nC8-nC10 (total)	150	140	700	-	-	670	<160	490	1100	<170	980	<170	1400	<160	790	460	<160	2200	-	-	480	170000	-	-	-	-
nC8-nC10 (aromatic)	15	2.9	<17	-	-	22	<3.3	<15	91	<3.3	67	<3.3	78	5.4	66	85	<3.2	320	-	-	200	76000	-	-	-	-
nC8-nC10 (aliphatic)	150	140	700	-	-	670	<160	490	1000	<170	910	<170	1300	<160	730	390	<160	1800	-	-	270	93000	-	-	-	-
nC6-nC10 (F1)	310	290	1200	-	-	1400	<330	710	1500	<330	1600	<330	2200	350	2500	1900	<320	2700	-	-	850	180000	-	-	-	-
nC10-nC12 (total)	150	140	570	-	-	710	<160	370	2500	<170	3000	<170	2200	160	1200	1100	<160	4500	-	-	950	160000	-	-	-	-
nC10-nC12 (aromatic)	15	2.9	<17	-	-	<16	<3.3	<15	<16	<3.3	<17	<3.3	<16	20	<17	<16	<3.2	180	-	-	240	43000	-	-	-	-
nC10-nC12 (aliphatic)	150	140	570	-	-	710	<160	370	2500	<170	3000	<170	2200	<160	1200	1100	<160	4200	-	-	710	120000	-	-	-	-
nC12-nC16 (total)	150	290	270	-	-	740	<330	220	1700	<330	2200	<330	880	<320	2400	2800	<320	3500	-	-	<340	150000	-	-	-	-
nC12-nC16 (aromatic)	15	2.9	<17	-	-	<16	<3.3	<15	<16	<3.3	<17	<3.3	<16	<3.2	<17	<16	<3.2	<16	-	-	<3.4	1200	-	-	-	-
nC12-nC16 (aliphatic)	150	290	260	-	-	740	<330	230	1700	<330	2200	<330	880	<320	2400	2800	<320	3500	-	-	<340	150000	-	-	-	-
nC10-nC16 (total) (F2)	310	290	840	-	-	1400	<330	580	4200	<330	5100	<330	3000	350	3600	3900	<320	8100	-	-	1300	310000	-	-	-	-
VHv (6-13)	310	570	970	-	-	1300	<660	650	2800	<660	2900	<660	2500	<630	2900	2700	<650	4500	-	-	1700	360000	-	-	-	-
VPHv	310	570	940	-	-	1200	<660	610	2700	<660	2700	<660	2400	<630	2500	2400	<650	4200	-	-	1700	330000	-	-	-	-
Volatile Organic Compounds																										
1,1,1,2-Tetrachloroethane	0.15	0.14	<0.17	-	-	<0.16	4.6	<0.15	<0.16	0.33	<0.17	0.53	<0.16	0.47	<0.17	<0.16	0.23	<0.16	-	-	1.2	<0.33	-	-		
1,1,1-Trichloroethane	0.31	0.29	<0.34	0.46	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.459	ND	<0.34	<0.33	2.02	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.15	0.14	<0.17	0.585	ND	<0.16	<0.16	<0.15	<0.16	<0.17	<0.17	<0.17	<0.16	<0.16	<0.17	<0.16	<0.16	<0.16	0.583	ND	<0.17	<0.23	2.57	ND	ND	ND
1,1,2-Trichloroethane	0.15	0.14	<0.17	0.46	ND	<0.16	<0.16	<0.15	<0.16	<0.17	<0.17	<0.17	<0.16	<0.16	<0.17	<0.16	<0.16	<0.16	0.459	ND	<0.17	<0.33	2.02	ND	ND	ND
1,1,2-Trichlorotrifluoroethane	-	-	-	0.653	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.651	ND	-	<0.66	2.87	ND	ND	ND
1,1-Dichloroethane	0.31	0.29	<0.34	0.345	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.344	ND	<0.34	<0.33	1.51	ND	ND	ND
1,1-Dichloroethene	0.092	0.086	<0.1	0.402	ND	<0.096	<0.099	<0.092	<0.097	<0.099	<0.1	<0.099	<0.098	0.13	<0.099	<0.099	<0.097	<0.097	0.401	ND	<0.1	<0.33	1.77	ND	ND	ND
1,2,3-Trichloropropane	0.31	0.29	<0.34	-	-	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	-	-	<0.34	<0.33	-	-	-	-
1,2,3-Trimethylbenzene	3.1	-	<3.4	0.818	1.29	<3.2	-	<3.1	4.9	-	<3.4	-	<3.3	-	<3.3	<3.3	-	68	0.816	35.8	-	-	3.59	578	2140	1590
1,2,4,5-Tetramethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	9.7	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	0.31	0.29	0.8	0.611	ND	<0.32	<0.33	0.61	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	0.86	<0.33	<0.32	<0.32	0.609	ND	<0.34	<0.33	2.68	ND	ND	ND
1,2,4-Triethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	12000	-	-	-	-
1,2,4-Trimethylbenzene	0.61	0.58	<0.67	0.419	4.11	1.2	<0.66	0.77	11	<0.66	7.4	<0.66	5.2	1.9	6.9	6.9	<0.65	61	0.418	39	44	-	30.1	1380	10700	9270
1,2-Dibromo-3-chloropropane	0.31	0.29	<0.34	-	-	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	-	-	<0.34	<0.33	-	-	-	-
1,2-Dibromoethane	0.31	0.29	<0.34	-	-	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	-	-	<0.34	<0.33	-	-	-	-
1,2-Dibromoethane (EDB)	-	-	-	0.655	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.653	ND	-	-	2.88	ND	ND	ND
1,2-Dichloro-1,1,2,2-tetrafluoroethane	-	-	-	0.59	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.588	ND	-	-	2.59	ND	ND	ND
1,2-Dichlorobenzene	0.31	0.29	<0.34	0.507	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.506	ND	<0.34	<0.33	2.23	ND	ND	ND
1,2-Dichloroethane	0.092	0.086	<0.1	0.345	ND	<0.096	<0.099	<0.092	<0.097	<0.099	<0.1	<0.099	<0.098	<0.095	<0.099	<0.099	<0.097	<0.097	0.344	ND	<0.1	<0.2	1.51	ND	ND	ND
1,2-Dichloropropane	0.15	0.14	<0.17	0.394	ND	<0.16	<0.16	<0.15	<0.16	<0.17	<0.17	<0.17	<0.16	<0.16	<0.17	<0.16	<0.16	<0.16	0.393	ND	<0.17	<0.33	1.73	ND	ND	ND
1,2-Diethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
1,2-Dimethyl-3-Ethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
1,2-Dimethyl-4-Ethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	20	-	-	-	-	-	-	-	-
1,3,5-Triethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	0.61	0.58	<0.67	0.419	1.5	1.1	<0.66	<0.61	4.9	<0.66	3.4	<0.66	2.4	0.76	2.4	1.7	<0.65	61	0.418	89.2	26	7300	1.84	746	6470	5530
1,3-Butadiene	-	-	-	0.165	30.7	-	-	-	-	-	-	-	-	-	-	-	-	-	0.165	4.35	-	<1.3	0.726	ND	ND	ND
1,3-Dichlorobenzene	0.31	0.29	<0.34	0.507	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.506	ND	<0.34	<0.33	2.23	ND	ND	ND
1,3-Dichloropropane	0.31	0.29	<0.34	-	-	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	-	-	<0.34	<0.33	-	-	-	-
1,3-Dichloropropene (cis+trans)	0.31	0.29	<0.34	-	-	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	-	-	<0.34	<0.66	-	-	-	-
1,3-Diethylbenzene	-	-	-	0.905	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.902	14	-	-	3.97	133	456	347
1,3-Dimethyl-2-Ethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
1,3-Dimethyl-5-Ethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	5.8	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	0.31	0.29	<0.34	0.512	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.511	ND	<0.34	<0.33	2.25	ND	ND	ND
1,4-Diethylbenzene	-	-	-	0.896	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.893	ND	-	-	3.93	52.7	209	152
1,4-Dimethyl-2-Ethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	6.1	-	-	-	-	-	-	-	-
1,4-Dioxane	-	-	-	0.442	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.441	ND	-	-	3.61	ND	ND	ND
1-Butene/Isobutene	-	-	-	31.3	598	-	-	-	-	-	-	-	-	-	-	-	-	-	0.677	178	-	-	0.931	1.49	ND	ND
1-Decene	-	-	-	0.902	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.899	ND	-	-	3.96	ND	ND	ND
1-Heptene	-	-	-	0.631	48.5	-	-	-	-	-	-	-	-	-	-	-	-	-	0.629	28.5	-	-	2.77	3.32	4.46	3.79
1-Hexene	-	-	-	0.532	132	-	-	-	-	-	-	-	-	-	-	-	-	-	0.53	ND	-	-	2.33	ND	ND	ND
1-methyl-2-ethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	5.5	-	4	-	3.9	-	3.6	3.3	-	20	-	-	-	-	-	-	-	-
1-Methyl-2-Isopropylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
1-Methyl-2-n-Propylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	3.5	-	-	-	-	-	-	-	-
1-methyl-3-ethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	11	-	7.4	-	5.6	-	5.9	5.6	-	39	-	-	-	-	-	-	-	-
1-Methyl-3-Isopropylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
1-Methyl-3-n-Propylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	8.4	-	-	-	-	-	-	-	-
1-methyl-4-ethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	6.2	-	4.4	-	3.6	-	4	3.9	-	<3.2	-	-	-	-	-	-	-	-
1-Methyl-4-Isopropylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
1-Methyl-4-n-Propylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
1-Methylcyclohexene	-	-	-	0.345	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.344	1.28	-	-	1.52	ND	ND	ND
1-Methylcyclopentene	-	-	-	0.292	3.82	-	-	-	-	-	-	-	-	-	-	-	-	-	0.291	0.706	-	-	1.28	ND	ND	ND
1-Nonene	-	-	-	0.811	3.23	-	-	-	-	-	-	-	-	-	-	-	-	-	0.809	23.2	-	-	3.56	ND	498	587
1-Octene	-	-	-	0.203	5.2	-	-	-	-	-	-	-	-	-	-	-	-	-	0.202	6.31	-	-	0.89	6.06	236	188

Notes:
All units in $\mu g/m^3$, unless otherwise noted.
mbgs - metres below ground surface
A denotes deeper well, B denotes shallow well.
DUP - duplicate sample

Sample Location ID			MW10-1					MW10-2	MW10-3B						MW10-5				MW10-6								
LAB ID			R103247-01		AUC0212-03	R103247-02	2110724-01	R103247-03	R103247-04	2110724-03	R103247-05	2110724-04	R103247-06	2110724-02	R103247-07	R103247-08	2110724-05	R103247-09		AUC0212-04	2110724-06	3041469-05		AVK0120-01	AWD0187-04	AWD0187-05
SAMPLE METHOD			Well		Well	Deep probe	Deep probe	Well	Shallow probe	Shallow probe	Deep probe	Deep probe	Well	Well	Well	Deep probe	Deep probe	Deep probe		Well	Well	Well		Well	Well	Well
SAMPLE DEPTH (mbgs)			2.7-3.3		2.7-3.3	2.4-2.55	2.4-2.55	2.5-3.1	0.81-1.37	0.81-1.37	1.68-2.13	1.68-2.13	2.74-3.00	2.74-3.00	2.13-3.9	1.07-1.52	1.07-1.52	1.65-2.44		3.04-3.42	3.04-4.5	'3.04-3.15		3.04-4.5	'3.04-3.15	'3.04-3.15
DATE SAMPLED			09-Mar-11		09-Mar-11	09-Mar-11	10-Nov-12	09-Mar-11	09-Mar-11	10-Nov-12	09-Mar-11	10-Nov-12	09-Mar-11	10-Nov-12	11-Mar-11	11-Mar-11	10-Nov-12	10-Mar-11		10-Mar-11	10-Nov-12	25-Apr-13		12-Nov-12	25-Apr-13	25-Apr-13
LABORATORY			CARO		Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO		Test America	CARO	CARO		Test America	Test America	Test america (DUP)
MATRIX	CARO RDL 2011	CARO RDL 2012	Air	Test America MDL 2011	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Test America MDL	Air	Air	Air	Test America MDL	Air	Air	Air
1-Pentene	-	-	-	1.23	395	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	50.2	-	-	0.969	ND	ND	ND
1-Undecene	-	-	-	0.515	5.84	-	-	-	-	-	-	-	-	-	-	-	-	-	0.514	ND	-	-	2.26	ND	ND	ND
2 & 3-Chlorotoluene	-	-	-	0.886	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.884	ND	-	-	3.89	ND	ND	ND
2,2,3-Trimethylpentane	-	-	-	0.394	6.86	-	-	-	-	-	-	-	-	-	-	-	-	-	0.393	4.58	-	-	1.73	ND	ND	ND
2,2,4-Trimethylpentane	-	-	-	0.398	6.18	-	-	-	-	-	-	-	-	-	-	-	-	-	0.397	2.73	-	-	1.75	ND	ND	ND
2,2,5-Trimethylhexane	-	-	-	0.46	19.6	-	-	-	-	-	-	-	-	-	-	-	-	-	0.459	9.62	-	-	2.02	ND	ND	ND
2,2-Dimethylbutane	-	-	-	0.281	8.66	-	-	-	-	-	-	-	-	-	-	-	-	-	0.281	2.58	-	-	1.24	ND	ND	ND
2,3,4-Trimethylpentane	-	-	-	0.275	22.2	-	-	-	-	-	-	-	-	-	-	-	-	-	0.274	11.1	-	-	1.21	ND	ND	ND
2,3-Dimethylbutane	-	-	-	0.208	19.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.208	5.73	-	-	0.914	ND	ND	ND
2,3-Dimethylpentane	-	-	-	0.353	24.5	-	-	-	-	-	-	-	-	-	-	-	-	-	0.352	11.9	-	-	1.55	ND	ND	ND
2,4,4-Trimethyl-1-pentene	-	-	-	0.387	0.516	-	-	-	-	-	-	-	-	-	-	-	-	-	0.386	ND	-	-	1.7	ND	ND	ND
2,4,4-Trimethyl-2-pentene	-	-	-	0.402	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.401	ND	-	-	1.77	ND	ND	ND
2,4-Dimethylpentane	-	-	-	0.349	9.26	-	-	-	-	-	-	-	-	-	-	-	-	-	0.348	4.24	-	-	1.53	ND	ND	ND
2,5-Dimethylhexane	-	-	-	0.394	6.31	-	-	-	-	-	-	-	-	-	-	-	-	-	0.393	3.39	-	-	1.73	ND	3.62	2.78
2-Butanone (MEK)	-	0.58	-	-	-	-	<0.66	-	-	<0.66	-	<0.66	-	<0.63	-	-	<0.65	-	-	-	<0.68	<1.7	2.18	ND	ND	ND
2-Chlorotoluene	0.61	0.58	<0.67	-	-	<0.64	<0.66	<0.61	<0.65	<0.66	<0.67	<0.66	<0.65	<0.63	<0.66	<0.66	<0.65	<0.64	-	-	<0.68	<0.66	-	-	-	-
2-Ethyl-1-butene	-	-	-	0.291	27.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.29	2.33	-	-	1.28	ND	ND	ND
2-Ethyltoluene	-	-	-	0.419	0.88	-	-	-	-	-	-	-	-	-	-	-	-	-	0.418	34.5	-	-	1.84	153	1270	998
2-Hexanone	-	-	-	0.238	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.237	ND	-	-	1.04	ND	ND	ND
2-Methyl-1-pentene	-	-	-	0.253	94.8	-	-	-	-	-	-	-	-	-	-	-	-	-	0.252	9.53	-	-	1.11	ND	ND	ND
2-Methyl-2-butene	-	-	-	0.193	38.5	-	-	-	-	-	-	-	-	-	-	-	-	-	0.192	3.75	-	-	0.847	ND	ND	ND
2-Methyl-2-pentene	-	-	-	0.285	7.37	-	-	-	-	-	-	-	-	-	-	-	-	-	0.284	0.457	-	-	1.25	ND	ND	ND
2-Methylbutylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-			-	-
2-Methylheptane	-	-	-	0.398	26.4	-	-	-	-	-	-	-	-	-	-	-	-	-	0.397	1.77	-	-	1.75	26.6	466	347
3-Ethyltoluene	-	-	-	0.419	2.36	-	-	-	-	-	-	-	-	-	-	-	-	-	0.418	26.7	-	-	1.84	536	6790	5820
3-Methyl-1-butene	-	-	-	0.207	113	-	-	-	-	-	-	-	-	-	-	-	-	-	0.207	13.7	-	-	0.911	ND	ND	ND
3-Methylheptane	-	-	-	0.77	32.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.768	2.16	-	-	3.38	8.06	193	157
3-Methylhexane	-	-	-	0.294	73	-	-	-	-	-	-	-	-	-	-	-	-	-	0.294	21.8	-	-	1.29	2.79	4.65	4.31
3-Methylpentane	-	-	-	0.258	101	-	-	-	-	-	-	-	-	-	-	-	-	-	0.257	20.3	-	-	1.13	ND	3.42	3.17
4-Chlorotoluene	-	-	-	0.805	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.803	ND	-	-	3.54	ND	ND	ND
4-Ethyltoluene	-	-	-	0.415	1.05	-	-	-	-	-	-	-	-	-	-	-	-	-	0.414	16.5	-	-	1.82	275	3910	3370
4-Isopropyltoluene	-	-	-	0.897	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.894	63.6	-	-	3.94	471	2020	1580
4-Methyl-1-pentene	-	-	-	0.213	44.3	-	-	-	-	-	-	-	-	-	-	-	-	-	0.212	5.33	-	-	0.935	ND	ND	ND
4-Methyl-2-Pentanone (MIBK)	-	0.58	-	-	-	-	<0.66	-	-	<0.66	-	<0.66	-	<0.63	-	-	<0.65	-	-	-	<0.68	<0.66	3	ND	ND	ND
4-Nonene	-	-	-	0.172	4.17	-	-	-	-	-	-	-	-	-	-	-	-	-	0.172	15.8	-	-	0.757	ND	ND	ND
Acetaldehyde	-	-	-	0.532	19.4	-	-	-	-	-	-	-	-	-	-	-	-	-	0.531	16.4	-	-	2.34	ND	ND	ND
Acetone	3.1	2.9	<3.4	0.173	8.37	<3.2	3.6	<3.1	17	<3.3	20	<3.3	12	<3.2	7.9	<3.3	<3.2	<3.2	0.173	19.3	<3.4	4.3	0.761	6.06	5.11	4.54
Acetonitrile	-	-	-	0.163	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.162	0.207	-	-	0.715	ND	ND	ND
Acetylene	-	-	-	0.182	1.53	-	-	-	-	-	-	-	-	-	-	-	-	-	0.181	0.925	-	-	0.763	ND	ND	ND
Acrylonitrile	0.31	0.29	<0.34	0.667	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.665	ND	<0.34	<0.33	2.93	ND	ND	ND
Allyl chloride	0.15	0.14	<0.17	0.262	ND	<0.16	<0.16	<0.15	<0.16	<0.17	<0.17	<0.17	<0.16	<0.16	<0.17	<0.16	<0.16	<0.16	0.261	ND	<0.17	<0.33	1.15	ND	ND	ND
alpha-Pinene	-	-	-	0.479	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	6.2	577	-	-	2.11	178	13000	11200
Benzaldehyde	-	-	-	0.398	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.397	ND	-	-	1.75	ND	ND	ND
Benzene	0.15	0.14	3.7	0.205	14.6	5.8	0.95	0.68	2.9	0.89	3.7	0.99	2.3	1.3	0.59	0.53	2.3	2.4	0.205	1.21	1.8	1.2	0.902	ND	ND	ND
Benzyl chloride	-	-	-	1.58	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	1.57	ND	-	-	6.92	ND	ND	ND
beta-Pinene	-	-	-	0.475	0.985	-	-	-	-	-	-	-	-	-	-	-	-	-	0.473	40.4	-	-	2.08	27	510	455
Bromobenzene	0.31	0.29	<0.34	-	-	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	-	-	<0.34	<0.33			-	-
Bromochloromethane	-	-	-	0.464	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.463	ND	-	-	2.04	ND	ND	ND
Bromodichloromethane	0.15	0.14	<0.17	0.588	ND	<0.16	<0.16	<0.15	<0.16	<0.17	<0.17	0.2	<0.16	0.6	<0.17	<0.16	<0.16	<0.16	0.586	ND	<0.17	<0.33	2.58	ND	ND	ND
Bromoform	0.31	0.29	<0.34	0.907	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.904	ND	<0.34	<0.33	3.98	ND	ND	ND
Bromomethane	-	-	-	0.331	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.33	ND	-	-	1.45	ND	ND	ND
Butane	-	-	-	40.6	514	-	-	-	-	-	-	-	-	-	-	-	-	-	0.878	137	-	-	0.779	2.01	ND	ND
Butyl acrylate	-	-	-	1.52	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	1.52	ND	-	-	6.68	ND	ND	ND
Butyraldehyde	-	-	-	0.863	1.63	-	-	-	-	-	-	-	-	-	-	-	-	-	0.861	4.07	-	-	3.79	ND	ND	ND
Carbon disulfide	0.61	0.58	13	0.903	53.3	11	<0.66	3.7	8.1	<0.66	11	<0.66	8.5	<0.63	4	1.4	<0.65	12	0.9	40.8	<0.68	<3.3	3.97	ND	ND	ND
Carbon tetrachloride	0.092	0.086	<0.1	0.536	ND	<0.096	0.16	<0.092	<0.097	<0.099	<0.1	<0.099	<0.098	<0.095	<0.099	0.13	<0.097	<0.097	0.535	ND	<0.1	<0.33	2.35	ND	ND	ND
Chlorobenzene	0.31	0.29	<0.34	0.396	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.395	ND	<0.34	<0.33	1.74	ND	ND	ND
Chlorodifluoromethane	-	-	-	0.561	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.56	0.62	-	-	2.46	ND	ND	ND
Chloroethane	1.5	1.4	<1.7	0.16	ND	<1.6	<1.6	<1.5	<1.6	<1.7	<1.7	<1.7	<1.6	<1.6	<1.7	<1.6	<1.6	<1.6	0.159	ND	<1.7	<1.7	0.701	ND	ND	ND
Chloroform	0.15	0.14	8.4	0.416	25.6	4.5	0.39	2	2.9	0.73	4	36	16	79	1.1	0.43	<0.16	3.9	0.415	24.7	<0.17	150	1.83	2.24	79.6	73.2
Chloromethane	-	-	-	0.143	1.19	-	-	-	-	-	-	-	-	-	-	-	-	-	0.143	1.7	-	-	0.628	1.71	ND	ND
Chloroprene	-	-	-	0.219	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.219	ND	-	-	0.964	ND	ND	ND
cis/trans-4-Methyl-2-pentene	-	-	-	0.592	12.2	-	-	-	-	-	-	-	-	-	-	-	-	-	0.591	3.23	-	-	2.6	ND	ND	ND
cis-1,2-Dichloroethene	0.31	0.29	<0.34	0.338	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.337	4.25	1.3	2.8	1.48	ND	ND	ND
cis-1,3-Dichloropropene	-	-	-	0.387	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.386	ND	-	-	1.7	ND	ND	ND
cis-2-Butene	-	-	-	1.43	216	-	-	-	-	-	-	-	-	-	-	-	-	-	0.186	25.6	-	-	0.819	ND	ND	ND
cis-2-Hexene	-	-	-	0.562	40.8	-	-	-	-	-	-	-	-	-	-	-	-	-	0.561	0.645	-	-	2.47	ND	ND	ND
cis-2-Octene	-	-	-	0.387	4.08	-	-	-	-	-	-	-	-	-	-	-	-	-	0.386	3.99	-	-	1.7	ND	96.9	78.7
cis-2-Pentene	-	-	-	0.226	112	-	-	-	-	-	-	-	-	-	-	-	-	-	0.226	6.69	-	-	0.993	ND	ND	ND
cis-3-Heptene	-	-	-	0.143	19.4	-	-	-	-	-	-	-	-	-	-	-	-	-	0.143	1.23	-	-	0.628	ND	ND	ND
cis-3-Hexene	-	-	-	0.299	19.5	-	-	-	-	-	-	-	-	-	-	-	-	-	0.298	0.903	-	-	1.31	ND	ND	ND
cis-3-Methyl-2-pentene	-	-	-	0.291	7.84	-	-	-	-	-	-	-	-	-	-	-	-	-	0.29	0.365	-	-	1.28	ND	ND	ND
Cumene	0.31	-	<0.34	0.81	ND	<0.32	-	<0.31	0.74	-	0.54	-	0.56	-	0.46	0.36	-	11	0.808	27.4	-	90	-	-	1540	1240
Cyclohexane	-	-	-	0.215	38.3	-	-	-	-	-	-	-	-	-	-	-	-	-	0.214	27.8	-	-	0.943	ND	ND	ND
Cyclohexene	-	-	-	0.131	1.86	-	-	-	-	-	-	-	-	-	-	-	-	-	0.131	0.635	-	-	0.575	ND	ND	ND
Cyclopentane	-	-	-	0.195	4.35	-	-	-	-	-	-	-	-	-	-	-	-	-	0.195	2.32	-	-	0.858	ND	ND	ND
Cyclopentene	-	-	-	0.186	10.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.185	1.35	-	-	0.817	ND	ND	ND
Dibromochloromethane	0.31	0.29	<0.34	0.747	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.745	ND	<0.34	<0.33	3.28	ND	-	-

Notes:
All units in $\mu g/m^3$, unless otherwise noted.
mbgs - metres below ground surface
A denotes deeper well, B denotes shallow well.
DUP - duplicate sample

Sample Location ID			MW10-1					MW10-2	MW10-3B						MW10-5				MW10-6								
LAB ID			R103247-01		AUC0212-03	R103247-02	2110724-01	R103247-03	R103247-04	2110724-03	R103247-05	2110724-04	R103247-06	2110724-02	R103247-07	R103247-08	2110724-05	R103247-09		AUC0212-04	2110724-06	3041469-05		AVK0120-01	AWD0187-04	AWD0187-05
SAMPLE METHOD			Well		Well	Deep probe	Deep probe	Well	Shallow probe	Shallow probe	Deep probe	Deep probe	Well	Well	Well	Deep probe	Deep probe	Deep probe		Well	Well	Well		Well	Well	Well
SAMPLE DEPTH (mbgs)			2.7-3.3		2.7-3.3	2.4-2.55	2.4-2.55	2.5-3.1	0.81-1.37	0.81-1.37	1.68-2.13	1.68-2.13	2.74-3.00	2.74-3.00	2.13-3.9	1.07-1.52	1.07-1.52	1.65-2.44		3.04-3.42	3.04-4.5	'3.04-3.15		3.04-4.5	'3.04-3.15	'3.04-3.15
DATE SAMPLED			09-Mar-11		09-Mar-11	09-Mar-11	10-Nov-12	09-Mar-11	09-Mar-11	10-Nov-12	09-Mar-11	10-Nov-12	09-Mar-11	10-Nov-12	11-Mar-11	11-Mar-11	10-Nov-12	10-Mar-11		10-Mar-11	10-Nov-12	25-Apr-13		12-Nov-12	25-Apr-13	25-Apr-13
LABORATORY			CARO		Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO		Test America	CARO	CARO		Test America	Test America	Test america (DUP)
MATRIX	CARO RDL 2011	CARO RDL 2012	Air	Test America MDL 2011	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Test America MDL	Air	Air	Air	Test America MDL	Air	Air	Air
Dibromomethane	0.31	0.29	<0.34	-	-	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	-	-	-	<0.34	<0.33	-	-	-	-
Dichlorodifluoromethane	0.61	0.58	5.7	0.417	2.59	6.4	5.3	4	3.9	5	5.4	5	2	3.8	4.3	8.5	4.9	9.3	0.416	2.83	5.1	5	1.83	2.39	ND	ND
Dichlorofluoromethane	-	-	-	0.359	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.358	ND	-	-	1.58	ND	ND	ND
Diethyl ether	-	-	-	0.466	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.465	ND	-	-	2.05	ND	ND	ND
Ethane	-	-	-	57.8	2250	-	-	-	-	-	-	-	-	-	-	-	-	-	3.24	314	-	-	0.434	5.86	2.06	2.43
Ethanol	-	-	-	1.58	230	-	-	-	-	-	-	-	-	-	-	-	-	-	1.58	398	-	-	2.45	3.06	ND	ND
Ethene	-	-	-	47.2	812	-	-	-	-	-	-	-	-	-	-	-	-	-	1.02	265	-	-	0.516	15	1.55	2.1
Ethyl acetate	1.5	1.4	<1.7	-	-	<1.6	<1.6	<1.5	<1.6	<1.7	<1.7	<1.7	<1.6	<1.6	<1.7	<1.6	<1.6	<1.6	-	-	<1.7	<1.7	-	-	-	-
Ethyl ether	0.61	0.58	<0.67	-	-	<0.64	<0.66	<0.61	<0.65	<0.66	<0.67	<0.66	<0.65	<0.63	<0.66	<0.66	<0.65	<0.64	-	-	<0.68	<0.66	-	-	-	-
Ethyl methacrylate	0.31	0.29	<0.34	-	-	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	-	-	<0.34	<0.33	-	-	-	-
Ethylbenzene	0.31	0.29	0.47	0.37	5.82	2.8	<0.33	<0.31	5.5	<0.33	4	<0.33	7.8	0.47	5.3	9.5	<0.32	25	0.369	17.7	5.1	8600	1.62	24	7640	6850
Halocarbon 134A	-	-	-	0.355	3.95	-	-	-	-	-	-	-	-	-	-	-	-	-	0.354	0.8	-	-	1.56	ND	ND	ND
Heptanal	-	-	-	1.35	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	1.35	ND	-	-	5.95	ND	ND	ND
Heptane	-	-	-	0.241	48.1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.24	1.48	-	-	1.06	9.48	18.6	18
Hexachlorobutadiene	0.15	0.14	0.44	0.916	ND	<0.16	<0.16	0.34	<0.16	<0.17	<0.17	<0.17	<0.16	<0.16	<0.17	<0.16	<0.16	<0.16	0.913	ND	<0.17	<0.33	4.02	ND	ND	ND
Hexachloroethane	0.31	0.29	<0.34	-	-	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	-	-	<0.34	<1.3	-	-	-	-
Hexanal	-	-	-	0.541	5	-	-	-	-	-	-	-	-	-	-	-	-	-	0.54	ND	-	-	2.38	6.22	ND	ND
Hexane	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	1.19	ND	5.79	5.94
Indan	-	-	-	0.424	0.724	-	-	-	-	-	-	-	-	-	-	-	-	-	0.423	83.8	-	-	30.5	2840	14400	12300
Indene	-	-	-	0.189	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.188	12.3	-	-	13.6	803	3640	3260
Isobutane	-	-	-	1.63	378	-	-	-	-	-	-	-	-	-	-	-	-	-	0.205	40.2	-	-	0.903	ND	ND	ND
Isobutylbenzene	3.1	0.29	<3.4	0.481	ND	<3.2	<0.33	<3.1	<3.2	<0.33	<3.4	<0.33	<3.3	<0.32	<3.3	<3.3	1.8	<3.2	0.48	2.88	2.7	-	2.11	7.1	57.7	41
Isoheptane	-	-	-	0.349	53.2	-	-	-	-	-	-	-	-	-	-	-	-	-	0.348	8.77	-	-	1.53	2.72	4.74	3.89
Isohexane	-	-	-	0.234	112	-	-	-	-	-	-	-	-	-	-	-	-	-	0.234	27.8	-	-	1.03	ND	5.75	5.4
Isopentane	-	-	2.5	383	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.469	54.4	-	-	2.06	ND	1.38	ND
Isoprene	-	-	-	0.201	13.1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	1.44	-	-	0.881	ND	ND	ND
Isopropyl alcohol	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.07	-	-	-	-	-	-
Isopropylbenzene	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.4	-	-	-	-	-	-
Limonene	-	-	-	-	3.31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56.8	-	-	-	-	-	-
Methacrylonitrile	-	-	<0.34	-	-	<0.32	-	<0.31	<0.32	-	<0.34	-	<0.33	-	<0.33	<0.33	-	<0.32	-	-	-	-	-	-	-	-
Methanol	-	-	-	-	2030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	131	-	-	1.93	9.16	5.09	5.89
Methyl acrylate	-	-	<1.7	-	-	<1.6	-	<1.5	<1.6	-	<1.7	-	<1.6	-	<1.7	<1.6	-	<1.6	-	-	-	-	-	-	-	-
Methyl ethyl ketone	0.61	-	<0.67	0.496	3.14	<0.64	-	<0.61	2.6	-	5.4	-	3.1	-	1.3	<0.66	-	<0.64	0.494	8.54	-	-	-	-	-	-
Methyl isobutyl ketone	0.61	-	<0.67	0.682	ND	<0.64	-	<0.61	0.97	-	1	-	0.65	-	<0.66	<0.66	-	<0.64	0.68	ND	-	-	-	-	-	-
Methyl methacrylate	0.61	0.58	<0.67	-	-	<0.64	<0.66	<0.61	<0.65	<0.66	<0.67	<0.66	<0.65	<0.63	2.1	<0.66	<0.65	<0.64	-	-	<0.68	<0.66	-	-	-	-
Methyl tert-butyl ether	0.61	0.58	<0.67	0.566	ND	<0.64	<0.66	<0.61	<0.65	<0.66	<0.67	<0.66	<0.65	<0.63	<0.66	<0.66	<0.65	<0.64	0.565	ND	<0.68	<0.66	2.49	ND	ND	ND
Methylcyclohexane	0.61	0.58	5.7	0.342	86.6	4.8	<0.66	<0.61	5.8	<0.66	6.1	<0.66	11	<0.63	1.6	0.72	<0.65	6.4	0.341	89.6	12	160	1.5	7.28	24.5	21.7
Methylcyclopentane	-	-	-	0.217	24.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.216	14.5	-	-	0.953	ND	ND	ND
Methylene chloride	3.1	2.9	<3.4	0.299	0.796	<3.2	<3.3	5.2	<3.2	<3.3	<3.4	<3.3	<3.3	<3.2	<3.3	<3.3	<3.2	<3.2	0.298	0.973	<3.4	<3.3	1.31	ND	ND	ND
m-Xylene & p-Xylene	-	-	-	0.74	18.1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.738	42.4	-	-	3.25	104	20700	18200
Naphthalene	0.31	0.29	<0.34	0.709	ND	<0.32	<0.33	<0.31	<0.32	0.5	<0.34	<0.33	<0.33	20	2	<0.33	<0.32	58	0.707	30.7	190	32000	51	10500	29100	20500
n-Butanol	-	-	-	0.448	27.3	-	-	-	-	-	-	-	-	-	-	-	-	-	0.447	21.6	-	-	3.81	ND	ND	ND
n-Butylbenzene	3.1	-	<3.4	0.233	ND	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	0.232	ND	-	-	1.02	ND	ND	ND
nC10-nC12 Non-reg. Aromatics	15	-	<17	-	-	<16	-	<15	<16	-	<17	-	<16	-	<17	<16	-	130	-	-	-	-	-	-	-	-
nC10-nC12 Other Aromatics	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
nC12-nC16 Non-reg. Aromatics	15	-	<17	-	-	<16	-	<15	<16	-	<17	-	<16	-	<17	<16	-	<16	-	-	-	-	-	-	-	-
nC12-nC16 Other Aromatics	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
nC8-nC10 Non-reg. Aromatics	15	-	<17	-	-	<16	-	<15	28	-	21	-	18	-	18	17	-	71	-	-	-	-	-	-	-	-
n-Decane	0.92	0.86	<1	0.496	4.1	1.7	<0.99	<0.92	21	<0.99	19	<0.99	12	<0.95	2.8	1.4	<0.97	<0.97	0.494	3.51	13	3600	2.18	296	2960	2080
Neopentane	-	-	-	0.264	3.52	-	-	-	-	-	-	-	-	-	-	-	-	-	0.263	0.747	-	-	1.16	ND	ND	ND
n-Hexane	3.1	2.9	6.7	0.272	121	6.7	<3.3	<3.1	4.2	<3.3	4	<3.3	7.8	<3.2	<3.3	<3.3	<3.2	<3.2	0.271	2.15	5.1	17	-	-	-	-
n-Hexylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
Nitrobenzene	0.31	0.29	<0.34	-	-	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	-	-	<0.34	<0.33	-	-	-	-
n-Nonane	-	-	-	0.447	1.93	-	-	-	-	-	-	-	-	-	-	-	-	-	0.446	2.05	-	-	1.96	20.1	4500	3820
n-Octane	-	-	-	0.402	21.5	-	-	-	-	-	-	-	-	-	-	-	-	-	0.401	2.11	-	-	1.77	41.3	3140	2770
n-Pentane	-	-	-	1.96	436	-	-	-	-	-	-	-	-	-	-	-	-	-	0.251	29.2	-	-	1.1	ND	ND	ND
n-Pentylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
n-Propylbenzene	3.1	-	<3.4	0.423	0.742	3.5	-	<3.1	5.2	-	4.7	-	4.3	-	4.3	4.3	-	13	0.422	6.39	-	-	1.86	21.8	590	461
n-Undecane	-	-	-	0.29	1.08	-	-	-	-	-	-	-	-	-	-	-	-	-	0.289	6.75	-	-	1.27	607	1440	1080
o-Xylene	-	-	-	0.37	12.1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.369	53.8	-	-	1.62	82.5	8260	7230
Propane	-	-	-	48.2	1350	-	-	-	-	-	-	-	-	-	-	-	-	-	1.04	292	-	-	0.651	3.71	ND	ND
Propanol	-	-	-	0.718	55.4	-	-	-	-	-	-	-	-	-	-	-	-	-	0.716	31.2	-	-	3.52	ND	ND	ND
Propylene	-	-	-	25.3	919	-	-	-	-	-	-	-	-	-	-	-	-	-	0.547	283	-	-	0.652	2.83	ND	ND
sec-Butylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	5.2	-	-	-	-	-	-	-	-
Styrene	0.31	0.29	<0.34	0.363	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.362	ND	<0.34	25	1.59	ND	15.1	13.3
t-1-Butyl-3,5-Dimethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
t-1-Butyl-4-Ethylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
tert-1-Butyl-2-Methylbenzene	3.1	-	<3.4	-	-	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	-	-	-	-	-	-	-	-
tert-Butylbenzene	3.1	-	<3.4	0.481	ND	<3.2	-	<3.1	<3.2	-	<3.4	-	<3.3	-	<3.3	<3.3	-	<3.2	0.48	ND	-	-	2.12	ND	ND	ND
Tetrachloroethene	1.5	1.4	15	0.578	19	71	4.6	3.4	4.5	<1.7	3	<1.7	3.6	<1.6	79	8.9	<1.6	32	0.576	228	<1.7	43	2.54	18.7	25.9	22.5
Tetrahydrofuran	0.31	0.29	<0.34	-	-	<0.32	<0.33	0.43	0.52	<0.33	1	<0.33	0.59	<0.32	0.56	<0.33	<0.32	<0.32	-	-	<0.34	<0.33	-	-	-	-
Toluene	3.1	2.9	20	0.321	182	90	<3.3	3.7	21	<3.3	81	<3.3	69	4.7	360	280	<3.2	81	0.32	35.4	7.8	100	1.41	12.8	1040	903
trans-1,2-Dichloroethene	0.31	0.29	<0.34	0.653	ND	<0.32	<0.33	<0.31	<0.32	<0.33	<0.34	<0.33	<0.33	<0.32	<0.33	<0.33	<0.32	<0.32	0.651	4.55	<0.34	<0.33	2.87	ND	ND	ND
trans-1,3-Dichloropropene	-	-	-	0.387	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.386	ND	-	-	1.7	ND	ND	ND
trans-2-Butene	-	-	-	0.178	51.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.177	8.77	-	-	0.781	ND	ND	ND
trans-2-Heptene	-	-	-	0.17	2.12	-	-	-	-	-	-	-	-	-	-	-	-	-	0.169	ND	-	-	0.746	ND	ND	ND
trans-2-Hexene	-	-	-	0.22	11.6	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	ND	-	-	0.968	ND	ND	ND
trans-2-Pentene	-	-	-	0.296	31.8	-	-	-	-	-	-	-	-	-	-	-	-	-	0.295	2.23	-	-	1.3	ND	ND	ND
trans-3-Heptene	-	-	-	0.335	4.55	-	-	-	-	-	-	-	-	-	-	-	-	-	0.335	ND	-	-	1.47	ND	ND	ND
trans-1,4-Dichloro-2-butene	-	0.29	-		-	-	<0.33	-	-	<0.33	-	<0.33	-	<0.32	-	-	<0.32	-	-	-	-	<0.34	-	-	-	-	-
Trichloroethene	0.092	0.086	0.27	0.458	0.898	<0.096	<0.099	<0.092	<0.097	<0.099	<0.1	<0.099	<0.098	0.095	<0.099	<0.099	<0.097	<0.097	0.457	4.42	0.51	3.7	2.01	ND	ND	ND
Trichlorofluoromethane	0.31	0.29	<0.34	0.474	1.02	0.77	1.3	0.71	<0.32	1.1	<0.34	1.2	<0.33	0.92	1.5	2.4	0.71	1.8	0.473	1.21	0.65	0.73	2.08	ND	ND	ND
Vinyl acetate	-	-	-	1.27	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	1.27	ND	-	-	5.59	ND	ND	ND
Vinyl bromide	-	-	-	0.68	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	0.679	ND	-	-	2.99	ND	ND	ND
Vinyl chloride	0.61	0.58	<0.67	0.205	ND	<0.64	<0.66	<0.61	<0.65	<0.66	<0.67	<0.66	<0.65	<0.63	<0.66	<0.66	<0.65	<0.64	0.204	0.214	<0.68	<0.66	0.899	ND	ND	ND
Xylenes (total)	1.5	1.4	6	0.549	30.3	16	<1.6	5.2	39	<1.7	31	<1.7	46	2.8	33	49	<1.6	110	0.548	96.1	23	33000	2.41	187	28900	25400

Notes:
All units in $\mu g/m^3$, unless otherwise noted.
mbgs - metres below ground surface
A denotes deeper well, B denotes shallow well.
DUP - duplicate sample

Sample Location ID			MW10-7B				MW10-9B		MW10-10	MW10-11					MW10-12	MW10-14	MW10-15					MW10-16							MW10-18		MW10-20
LAB ID			R103247-10	R103247-11	3041469-04	AWD0187-03	R103247-12	R103247-13	R103247-14	R103247-15	R103247-16	2110724-07	3041469-01	AWD0187-01	R103247-17	R103247-18	R103247-19	2110724-08		AUC0212-02	3041469-07	AWD0187-06	R103247-20	R103247-21	2110724-09	2110724-10	3041469-02	3041469-03	AWD0187-02	R103247-22	R103247-23	R103247-24
SAMPLE METHOD			Deep probe	Shallow probe	Deep Probe	Deep Probe	Well	Shallow probe	Well	Deep probe	Well	Well	Well	Well	Well	Well	Well	Well		Well	Well	Well	Deep probe	Well	Well	Well	Well	Well	Well	Well	Deep probe	Well
SAMPLE DEPTH (mbgs)			1.96-2.74	1.22-1.68	1.96-2.74	1.96-2.74	3.3-3.4	1.37-1.83	2.74-3.3	1.22-1.52	2.13-3.1	2.13-3.27	2.13-2.97	2.13-2.97	3.05-4.57	2.13-4.27	2.13-2.85	2.13-3.52		2.13-2.85	2.13-3.37	2.13-3.37	1.22-1.52	2.13-3.3	2.13-3.51	2.13-3.51	2.13-2.99	2.13-2.99	2.13-2.99	2.13-3.2	1.07-1.52	2.13-3.0
DATE SAMPLED			10-Mar-11	10-Mar-11	25-Apr-13	24-Apr-13	11-Mar-11	11-Mar-11	08-Mar-11	08-Mar-11	08-Mar-11	10-Nov-12	24-Apr-13	24-Apr-13	11-Mar-11	09-Mar-11	09-Mar-11	10-Nov-12		09-Mar-11	25-Apr-13	25-Apr-13	10-Mar-11	10-Mar-11	9-Nov-12	9-Nov-12	24-Apr-13	24-Apr-13	24-Apr-13	10-Mar-11	10-Mar-11	11-Mar-11
LABORATORY			CARO	CARO	CARO	Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	Test America	CARO	CARO	CARO	CARO		Test America	CARO	Test America	CARO	CARO	CARO	CARO (DUP)	CARO	CARO (DUP)	Test America	CARO	CARO	CARO
MATRIX	CARO RDL 2011	CARO RDL 2012	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Test America MDL	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air
Hydrocarbons																																
nC6-nC8 (total)	150	140	710	470	200	-	2300	430	370	390	550	220	<170	-	200	600	520	<170	-	-	<160	-	290	440	<150	<150	<220	<220	-	230	230	370
nC6-nC8 (aromatic)	3.1	2.9	140	81	14	-	610	66	16	32	44	65	<3.4	-	3.7	100	49	<3.4	-	-	4.9	-	14	47	15	<3	<4.4	<4.4	-	<3.3	5.7	57
nC6-nC8 (aliphatic)	150	140	580	370	200	-	1700	360	350	360	500	150	<170	-	200	500	490	<170	-	-	<160	-	280	410	<150	<150	<220	<220	-	230	230	320
nC8-nC10 (total)	150	140	840	540	630	-	1300	330	370	680	600	150	440	-	200	1100	1200	<170	-	-	880	-	740	2100	<150	<150	1000	760	-	290	870	640
nC8-nC10 (aromatic)	15	2.9	140	150	3.3	-	290	22	34	<24	<23	13	7.4	-	<17	90	33	4.4	-	-	23	-	19	210	5	<3	9.8	<4.4	-	<16	130	50
nC8-nC10 (aliphatic)	150	140	710	410	630	-	1000	310	350	680	550	<150	440	-	200	1000	1200	<170	-	-	850	-	740	1900	<150	<150	1000	760	-	280	770	600
nC6-nC10 (F1)	310	290	1600	1000	870	-	3700	760	740	1100	1100	370	540	-	400	1700	1800	<340	-	-	980	-	1000	2500	<300	<300	1200	890	-	520	1100	1000
nC10-nC12 (total)	150	140	650	240	670	-	470	300	<230	290	370	250	400	-	<170	1300	1600	200	-	-	1200	-	580	680	240	<150	1100	760	-	200	200	270
nC10-nC12 (aromatic)	15	2.9	45	<17	<3.3	-	<17	<16	<23	<24	<23	46	<3.4	-	<17	<17	<16	33	-	-	<3.3	-	<16	<17	<3	<3	<4.4	<4.4	-	<16	<17	<17
nC10-nC12 (aliphatic)	150	140	580	220	670	-	470	280	<230	270	340	200	400	-	<170	1300	1600	170	-	-	1200	-	580	680	240	<150	1100	760	-	190	200	260
nC12-nC16 (total)	150	290	650	300	500	-	270	300	230	290	920	<310	<340	-	200	660	560	<340	-	-	750	-	550	410	<300	<300	<440	<440	-	160	170	270
nC12-nC16 (aromatic)	15	2.9	<16	<17	<3.3	-	<17	<16	<23	<24	<23	<3.1	<3.4	-	<17	<17	<16	<3.4	-	-	<3.3	-	<16	<17	<3	<3	<4.4	<4.4	-	<16	<17	<17
nC12-nC16 (aliphatic)	150	290	650	310	500	-	280	290	250	300	920	<310	<340	-	190	660	560	<340	-	-	750	-	550	410	<300	<300	<440	<440	-	170	180	270
nC10-nC16 (total) (F2)	310	290	1300	540	1100	-	740	590	<470	580	1300	<310	610	-	<330	2000	2200	<340	-	-	2000	-	1100	1100	<300	<300	1500	1100	-	360	370	540
VHv (6-13)	310	570	1400	780	1500	-	2300	660	600	770	1100	<620	910	-	360	1700	1900	<670	-	-	2200	-	870	1400	<590	<590	2200	1600	-	420	600	670
VPHv	310	570	1100	580	1500	-	1400	560	560	720	1100	<620	910	-	330	1600	1800	<670	-	-	2200	-	840	1200	<590	<590	2200	1600	-	420	470	570
Volatile Organic Compounds																																
1,1,1,2-Tetrachloroethane	0.15	0.14	<0.16	<0.17	<0.33	-	<0.17	<0.16	<0.23	<0.24	<0.23	0.22	<0.34	-	<0.17	<0.17	<0.16	0.17	-	-	<0.33	-	<0.16	<0.17	2.3	<0.15	<0.44	<0.44	-	<0.16	<0.17	<0.17
1,1,1-Trichloroethane	0.31	0.29	<0.32	<0.34	<0.33	ND	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	ND	<0.33	<0.33	<0.33	<0.34	0.419	ND	<0.33	ND	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	ND	<0.33	<0.34	<0.34
1,1,2,2-Tetrachloroethane	0.15	0.14	<0.16	<0.17	<0.23	ND	<0.17	<0.16	<0.23	<0.24	<0.23	<0.15	<0.24	ND	<0.17	<0.17	<0.16	<0.17	0.532	ND	<0.23	ND	<0.16	<0.17	<0.15	<0.15	<0.31	<0.31	ND	<0.16	<0.17	<0.17
1,1,2-Trichloroethane	0.15	0.14	<0.16	<0.17	<0.33	ND	<0.17	<0.16	<0.23	<0.24	<0.23	<0.15	<0.34	ND	<0.17	<0.17	<0.16	<0.17	0.419	ND	<0.33	ND	<0.16	<0.17	<0.15	<0.15	<0.44	<0.44	ND	<0.16	<0.17	<0.17
1,1,2-Trichlorotrifluoroethane	-	-	-	-	<0.67	ND	-	-	-	-	-	-	<0.67	ND	-	-	-	-	0.594	0.684	0.72	ND	-	-	-	-	<0.89	<0.89	ND	-	-	-
1,1-Dichloroethane	0.31	0.29	<0.32	<0.34	<0.33	ND	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	ND	<0.33	<0.33	<0.33	<0.34	0.314	ND	<0.33	ND	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	ND	<0.33	<0.34	<0.34
1,1-Dichloroethene	0.092	0.086	<0.097	<0.1	<0.33	ND	<0.1	<0.099	<0.14	<0.15	<0.14	<0.093	<0.34	ND	<0.1	<0.1	<0.098	<0.1	0.366	ND	<0.33	ND	<0.097	<0.1	<0.089	<0.089	<0.44	<0.44	ND	<0.098	<0.1	<0.1
1,2,3-Trichloropropane	0.31	0.29	<0.32	<0.34	<0.33	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	-	<0.33	<0.33	<0.33	<0.34	-	-	<0.33	-	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	-	<0.33	<0.34	<0.34
1,2,3-Trimethylbenzene	3.1	-	<3.2	<3.4	-	ND	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	ND	<3.3	<3.3	<3.3	-	0.744	3.2	-	1.87	<3.2	<3.4	-	-	-	-	ND	<3.3	<3.4	<3.4
1,2,4,5-Tetramethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1,2,4-Trichlorobenzene	0.31	0.29	<0.32	<0.34	<0.33	ND	0.64	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	ND	<0.33	<0.33	<0.33	<0.34	0.556	ND	<0.33	ND	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	ND	<0.33	<0.34	0.77
1,2,4-Triethylbenzene	3.1	-	<3.2	<3.4	1.2	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	0.88	-	<3.3	<3.3	<3.3	-	-	-	9.1	-	<3.2	<3.4	-	-	2.5	1.3	-	<3.3	<3.4	<3.4
1,2,4-Trimethylbenzene	0.61	0.58	3.6	1.8	-	ND	2.6	<0.66	<0.93	2.6	<0.92	4.3		ND	<0.66	6	2.3	2.6	0.381	9.74		6.55	<0.64	1.5	1.8	1	-	-	ND	<0.65	<0.67	1.5
1,2-Dibromo-3-chloropropane	0.31	0.29	<0.32	<0.34	<0.33	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	-	<0.33	<0.33	<0.33	<0.34	-	-	<0.33	-	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	-	<0.33	<0.34	<0.34
1,2-Dibromoethane	0.31	0.29	<0.32	<0.34	<0.33	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	-	<0.33	<0.33	<0.33	<0.34	-	-	<0.33	-	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	-	<0.33	<0.34	<0.34
1,2-Dibromoethane (EDB)	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.596	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
1,2-Dichloro-1,1,2,2-tetrafluoroethane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.537	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
1,2-Dichlorobenzene	0.31	0.29	<0.32	<0.34	<0.33	ND	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	ND	<0.33	<0.33	<0.33	<0.34	0.462	ND	<0.33	ND	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	ND	<0.33	<0.34	<0.34
1,2-Dichloroethane	0.092	0.086	<0.097	<0.1	<0.2	ND	<0.1	<0.099	<0.14	<0.15	<0.14	<0.093	<0.2	ND	<0.1	<0.1	<0.098	<0.1	0.314	ND	<0.2	ND	<0.097	<0.1	<0.089	<0.089	<0.27	<0.27	ND	<0.098	<0.1	<0.1
1,2-Dichloropropane	0.15	0.14	<0.16	<0.17	<0.33	ND	<0.17	<0.16	<0.23	<0.24	<0.23	<0.15	<0.34	ND	<0.17	<0.17	<0.16	<0.17	0.358	ND	<0.33	ND	<0.16	<0.17	<0.15	<0.15	<0.44	<0.44	ND	<0.16	<0.17	<0.17
1,2-Diethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1,2-Dimethyl-3-Ethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1,2-Dimethyl-4-Ethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1,3,5-Triethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1,3,5-Trimethylbenzene	0.61	0.58	1.2	<0.68	<0.67	ND	0.85	<0.66	<0.93	<0.97	<0.92	1.9	<0.67	ND	<0.66	3.1	1.1	1	0.381	3.54	2.1	1.47	<0.64	<0.68	<0.59	<0.59	<0.89	<0.89	ND	<0.65	<0.67	<0.67
1,3-Butadiene	-	-	-	-	<1.3	ND	-	-	-	-	-	-	<1.4	ND	-	-	-	-	0.15	5.79	<1.3	ND	-	-	-	-	<1.8	<1.8	ND	-	-	-
1,3-Dichlorobenzene	0.31	0.29	<0.32	<0.34	<0.33	ND	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	ND	<0.33	<0.33	<0.33	<0.34	0.462	ND	<0.33	ND	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	ND	<0.33	<0.34	<0.34
1,3-Dichloropropane	0.31	0.29	<0.32	<0.34	<0.33	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	-	<0.33	<0.33	<0.33	<0.34	-	-	<0.33	-	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	-	<0.33	<0.34	<0.34
1,3-Dichloropropene (cis+trans)	0.31	0.29	<0.32	<0.34	<0.67	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.67	-	<0.33	<0.33	<0.33	<0.34	-	-	<0.65	-	<0.32	<0.34	<0.3	<0.3	<0.89	<0.89	-	<0.33	<0.34	<0.34
1,3-Diethylbenzene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.823	1.07	-	ND	-	-	-	-	-	-	ND	-	-	-
1,3-Dimethyl-2-Ethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1,3-Dimethyl-5-Ethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1,4-Dichlorobenzene	0.31	0.29	<0.32	<0.34	<0.33	ND	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	ND	<0.33	<0.33	<0.33	<0.34	0.466	ND	<0.33	ND	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	ND	<0.33	<0.34	<0.34
1,4-Diethylbenzene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.815	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
1,4-Dimethyl-2-Ethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1,4-Dioxane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.402	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
1-Butene/Isobutene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.965	142	-	7.53	-	-	-	-	-	-	ND	-	-	-
1-Decene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.82	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
1-Heptene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.574	19.8	-	ND	-	-	-	-	-	-	ND	-	-	-
1-Hexene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.484	30.5	-	ND	-	-	-	-	-	-	ND	-	-	-
1-methyl-2-ethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	4	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1-Methyl-2-Isopropylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1-Methyl-2-n-Propylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1-methyl-3-ethylbenzene	3.1	-	3.9	<3.4	-	-	4.1	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	7.6	3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1-Methyl-3-Isopropylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1-Methyl-3-n-Propylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1-methyl-4-ethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	5	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1-Methyl-4-Isopropylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1-Methyl-4-n-Propylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
1-Methylcyclohexene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.314	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
1-Methylcyclopentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.265	0.669	-	ND	-	-	-	-	-	-	ND	-	-	-
1-Nonene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.738	7.16	-	ND	-	-	-	-	-	-	ND	-	-	-
1-Octene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.184	3.38	-	ND	-	-	-	-	-	-	ND	-	-	-

Notes:
All units in $\mu g/m^3$, unless otherwise noted.
mbgs - metres below ground surface
A denotes deeper well, B denotes shallow well.
DUP - duplicate sample

Sample Location ID			MW10-7B				MW10-9B		MW10-10	MW10-11					MW10-12	MW10-14	MW10-15					MW10-16							MW10-18		MW10-20
LAB ID			R103247-10	R103247-11	3041469-04	AWD0187-03	R103247-12	R103247-13	R103247-14	R103247-15	R103247-16	2110724-07	3041469-01	AWD0187-01	R103247-17	R103247-18	R103247-19	2110724-08		AUG0212-02	3041469-07	AWD0187-06	R103247-20	R103247-21	2110724-09	2110724-10	3041469-02	3041469-03	AWD0187-02	R103247-22	R103247-23	R103247-24
SAMPLE METHOD			Deep probe	Shallow probe	Deep Probe	Deep Probe	Well	Shallow probe	Well	Deep probe	Well	Well	Well	Well	Well	Well	Well	Well		Well	Well	Well	Deep probe	Well	Well	Well	Well	Well	Well	Well	Deep probe	Well
SAMPLE DEPTH (mbgs)			1.96-2.74	1.22-1.68	1.96-2.74	1.96-2.74		1.37-1.83	2.74-3.3	1.22-1.52	2.13-3.1	2.13-3.27	2.13-2.97	2.13-2.97	3.05-4.57	2.13-4.27	2.13-2.85	2.13-3.52		2.13-2.85	2.13-3.37	2.13-3.37	1.22-1.52	2.13-3.3	2.13-3.51	2.13-3.51	2.13-2.99	2.13-2.99	2.13-2.99	2.13-3.2	1.07-1.52	2.13-3.0
DATE SAMPLED			10-Mar-11	10-Mar-11	25-Apr-13	24-Apr-13	11-Mar-11	11-Mar-11	08-Mar-11	08-Mar-11	08-Mar-11	10-Nov-12	24-Apr-13	24-Apr-13	11-Mar-11	09-Mar-11	09-Mar-11	10-Nov-12		09-Mar-11	25-Apr-13	25-Apr-13	10-Mar-11	10-Mar-11	9-Nov-12	9-Nov-12	24-Apr-13	24-Apr-13	24-Apr-13	10-Mar-11	10-Mar-11	11-Mar-11
LABORATORY			CARO	CARO	CARO	Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	Test America	CARO	CARO	CARO	CARO		Test America	CARO	Test America	CARO	CARO	CARO	CARO (DUP)	CARO	CARO (DUP)	Test America	CARO	CARO	CARO
MATRIX	CARO RDL 2011	CARO RDL 2012	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Test America MDL	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air
1-Pentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.201	57	-	ND	-	-	-	-	-	-	ND	-	-	-
1-Undecene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.469	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
2 & 3-Chlorotoluene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.807	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
2,2,3-Trimethylpentane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.359	1.43	-	ND	-	-	-	-	-	-	ND	-	-	-
2,2,4-Trimethylpentane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.362	1.79	-	ND	-	-	-	-	-	-	ND	-	-	-
2,2,5-Trimethylhexane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.419	3.24	-	ND	-	-	-	-	-	-	ND	-	-	-
2,2-Dimethylbutane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.256	1.05	-	ND	-	-	-	-	-	-	ND	-	-	-
2,3,4-Trimethylpentane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.25	3.69	-	ND	-	-	-	-	-	-	ND	-	-	-
2,3-Dimethylbutane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.189	2.55	-	ND	-	-	-	-	-	-	ND	-	-	-
2,3-Dimethylpentane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.321	5.2	-	ND	-	-	-	-	-	-	ND	-	-	-
2,4,4-Trimethyl-1-pentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.352	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
2,4,4-Trimethyl-2-pentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.366	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
2,4-Dimethylpentane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.318	1.74	-	ND	-	-	-	-	-	-	ND	-	-	-
2,5-Dimethylhexane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.359	1.61	-	ND	-	-	-	-	-	-	ND	-	-	-
2-Butanone (MEK)	-	0.58	-	-	<1.7	0.531	-	-	-	-	-	<0.62	<1.7	3.68	-	-	-	<0.67	-	-	<1.6	1.36	-	-	<0.59	<0.59	<2.2	<2.2	3.31	-	-	-
2-Chlorotoluene	0.61	0.58	<0.65	<0.68	<0.67	-	<0.68	<0.66	<0.93	<0.97	<0.92	<0.62	<0.67	-	<0.66	<0.66	<0.65	<0.67	-	-	<0.65	-	<0.64	<0.68	<0.59	<0.59	<0.89	<0.89	-	<0.65	<0.67	<0.67
2-Ethyl-1-butene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.264	4.87	-	ND	-	-	-	-	-	-	ND	-	-	-
2-Ethyltoluene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.381	2.42	-	0.975	-	-	-	-	-	-	ND	-	-	-
2-Hexanone	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.216	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
2-Methyl-1-pentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.23	15.7	-	ND	-	-	-	-	-	-	ND	-	-	-
2-Methyl-2-butene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.175	6.82	-	ND	-	-	-	-	-	-	ND	-	-	-
2-Methyl-2-pentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.259	1.41	-	ND	-	-	-	-	-	-	ND	-	-	-
2-Methylbutylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
2-Methylheptane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.362	11.2	-	ND	-	-	-	-	-	-	ND	-	-	-
3-Ethyltoluene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.381	9.75	-	2.63	-	-	-	-	-	-	ND	-	-	-
3-Methyl-1-butene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.189	12	-	ND	-	-	-	-	-	-	ND	-	-	-
3-Methylheptane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.7	8.94	-	ND	-	-	-	-	-	-	ND	-	-	-
3-Methylhexane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.268	16.8	-	0.412	-	-	-	-	-	-	ND	-	-	-
3-Methylpentane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.235	15.2	-	ND	-	-	-	-	-	-	ND	-	-	-
4-Chlorotoluene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.733	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
4-Ethyltoluene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.377	2.22	-	1.44	-	-	-	-	-	-	ND	-	-	-
4-Isopropyltoluene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.816	3.56	-	ND	-	-	-	-	-	-	ND	-	-	-
4-Methyl-1-pentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.194	5.61	-	ND	-	-	-	-	-	-	ND	-	-	-
4-Methyl-2-Pentanone (MIBK)	-	0.58	-	-	<0.67	ND	-	-	-	-	-	<0.62	<0.67	ND	-	-	-	<0.67	-	-	<0.65	ND	-	-	<0.59	<0.59	<0.89	<0.89	ND	-	-	-
4-Nonene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.157	3.23	-	ND	-	-	-	-	-	-	ND	-	-	-
Acetaldehyde	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.484	14.2	-	2.9	-	-	-	-	-	-	2.11	-	-	-
Acetone	3.1	2.9	18	21	<3.3	2.04	37	3.9	6.5	8.2	<4.6	<3.1	<3.4	2.66	14	<3.3	4.6	<3.4	0.158	8.84	<3.3	4.4	5.5	5.8	3.3	<3	<4.4	<4.4	3.83	<3.3	14	<3.4
Acetonitrile	-	-	-	-	<0.33	ND	-	-	-	-	-	-	<0.34	ND	-	-	-	-	0.148	ND	<0.33	ND	-	-	-	-	<0.44	<0.44	ND	-	-	-
Acetylene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.165	0.589	-	ND	-	-	-	-	-	-	ND	-	-	-
Acrylonitrile	0.31	0.29	<0.32	<0.34	-	ND	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	-	ND	<0.33	<0.33	<0.33	<0.34	0.607	ND	-	ND	<0.32	<0.34	<0.3	<0.3	-	-	ND	<0.33	<0.34	<0.34
Allyl chloride	0.15	0.14	<0.16	<0.17	<0.33	ND	<0.17	<0.16	<0.23	<0.24	<0.23	<0.15	<0.34	ND	<0.17	<0.17	<0.16	<0.17	0.238	ND	<0.33	ND	<0.16	<0.17	<0.15	<0.15	<0.44	<0.44	ND	<0.16	<0.17	<0.17
alpha-Pinene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	2.18	222	-	ND	-	-	-	-	-	-	ND	-	-	-
Benzaldehyde	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.362	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
Benzene	0.15	0.14	0.91	0.44	<0.67	ND	0.31	0.99	0.23	<0.24	0.78	0.65	<0.67	ND	<0.17	2.5	2.6	1.2	0.187	10.9	<0.65	ND	1	1.1	0.8	0.53	<0.89	<0.89	ND	0.23	0.54	0.2
Benzyl chloride	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	1.43	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
beta-Pinene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.432	58	-	ND	-	-	-	-	-	-	ND	-	-	-
Bromobenzene	0.31	0.29	<0.32	<0.34	<0.33	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	-	<0.33	<0.33	<0.33	<0.34	-	-	<0.33	-	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	-	<0.33	<0.34	<0.34
Bromochloromethane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.422	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
Bromodichloromethane	0.15	0.14	<0.16	<0.17	<0.33	ND	<0.17	<0.16	<0.23	<0.24	<0.23	<0.15	<0.34	ND	<0.17	<0.17	<0.16	<0.17	0.535	ND	<0.33	ND	<0.16	<0.17	<0.15	<0.15	<0.44	<0.44	ND	<0.16	<0.17	<0.17
Bromoform	0.31	0.29	<0.32	<0.34	<0.33	ND	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	ND	<0.33	<0.33	<0.33	<0.34	0.825	ND	<0.33	ND	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	ND	<0.33	<0.34	<0.34
Bromomethane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.301	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
Butane	-	-	-	-	-	0.243	-	-	-	-	-	-	-	1.08	-	-	-	-	0.161	115	-	0.458	-	-	-	-	-	-	1.22	-	-	-
Butyl acrylate	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	1.38	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
Butyraldehyde	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.785	1.22	-	ND	-	-	-	-	-	-	0.778	-	-	-
Carbon disulfide	0.61	0.58	1.6	<0.68	<3.3	ND	<0.68	3.9	<0.93	<0.97	2.9	<0.62	<3.4	ND	<0.66	12	8.2	<0.67	0.821	28.1	<3.3	ND	8.4	6.1	<0.59	<0.59	<4.4	<4.4	ND	<0.65	2	<0.67
Carbon tetrachloride	0.092	0.086	0.23	0.14	0.4	ND	0.2	0.13	<0.14	<0.15	0.23	0.12	<0.34	ND	<0.1	0.1	<0.098	0.17	0.488	ND	<0.33	ND	<0.097	<0.1	<0.089	<0.089	<0.44	<0.44	ND	0.52	0.1	<0.1
Chlorobenzene	0.31	0.29	<0.32	<0.34	<0.33	ND	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	ND	<0.33	<0.33	<0.33	<0.34	0.36	ND	<0.33	ND	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	ND	<0.33	<0.34	<0.34
Chlorodifluoromethane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.511	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
Chloroethane	1.5	1.4	<1.6	<1.7	<1.7	ND	<1.7	<1.6	<2.3	<2.4	<2.3	<1.5	<1.7	ND	<1.7	<1.7	<1.6	<1.7	0.145	ND	<1.6	ND	<1.6	<1.7	<1.5	<1.5	<2.2	<2.2	ND	<1.6	<1.7	<1.7
Chloroform	0.15	0.14	0.16	<0.17	3.3	3.87	0.27	0.72	0.33	0.29	5.5	<0.15	8.4	8.72	0.23	4.6	6.5	0.64	0.378	24.3	11	20.7	3.1	2.4	0.15	<0.15	1.2	<0.44	1.4	0.2	<0.17	0.8
Chloromethane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.13	0.931	-	0.258	-	-	-	-	-	-	ND	-	-	-
Chloroprene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.2	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
cis/trans-4-Methyl-2-pentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.539	1.73	-	ND	-	-	-	-	-	-	ND	-	-	-
cis-1,2-Dichloroethene	0.31	0.29	<0.32	<0.34	<0.33	ND	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	ND	<0.33	<0.33	<0.33	<0.34	0.307	ND	<0.33	ND	<0.32	0.41	<0.3	<0.3	<0.44	<0.44	ND	<0.33	<0.34	<0.34
cis-1,3-Dichloropropene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.352	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
cis-2-Butene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.17	26.7	-	ND	-	-	-	-	-	-	ND	-	-	-
cis-2-Hexene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.511	8.35	-	ND	-	-	-	-	-	-	ND	-	-	-
cis-2-Octene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.352	1.76	-	ND	-	-	-	-	-	-	ND	-	-	-
cis-2-Pentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.206	19.7	-	ND	-	-	-	-	-	-	ND	-	-	-
cis-3-Heptene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.13	3.67	-	ND	-	-	-	-	-	-	ND	-	-	-
cis-3-Hexene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.272	3.86	-	ND	-	-	-	-	-	-	ND	-	-	-
cis-3-Methyl-2-pentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.264	1.26	-	ND	-	-	-	-	-	-	ND	-	-	-
Cumene	0.31	-	0.49	0.37	<0.33	ND	0.95	<0.33	<0.47	<0.48	<0.46	-	<0.34	ND	<0.33	0.66	0.33	-	0.737	0.917	<0.33	ND	<0.32	0.78	-	-	<0.44	<0.44	ND	<0.33	<0.34	<0.34
Cyclohexane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.195	9.38	-	ND	-	-	-	-	-	-	ND	-	-	-
Cyclohexene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.119	0.53	-	ND	-	-	-	-	-	-	ND	-	-	-
Cyclopentane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.178	1.24	-	ND	-	-	-	-	-	-	ND	-	-	-
Cyclopentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.169	2.1	-	ND	-	-	-	-	-	-	ND	-	-	-
Dibromochloromethane	0.31	0.29	<0.32	<0.34	<0.33	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	-	<0.33	<0.33	<0.33	<0.34	0.68	ND	<0.33	-	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	-	<0.33	<0.34	<0.34

Notes:
All units in $\mu g/m^3$, unless otherwise noted.
mbgs - metres below ground surface
A denotes deeper well, B denotes shallow well.
DUP - duplicate sample

Sample Location ID			MW10-7B				MW10-9B		MW10-10	MW10-11					MW10-12	MW10-14	MW10-15										MW10-16							MW10-18		MW10-20
LAB ID			R103247-10	R103247-11	3041469-04	AWD0187-03	R103247-12	R103247-13	R103247-14	R103247-15	R103247-16	2110724-07	3041469-01	AWD0187-01	R103247-17	R103247-18	R103247-19	2110724-08		AUC0212-02	3041469-07	AWD0187-06	R103247-20	R103247-21	2110724-09	2110724-10	3041469-02	3041469-03	AWD0187-02	R103247-22	R103247-23	R103247-24
SAMPLE METHOD			Deep probe	Shallow probe	Deep Probe	Deep Probe	Well	Shallow probe	Well	Deep probe	Well	Well	Well	Well	Well	Well	Well	Well		Well	Well	Well	Deep probe	Well	Well	Well	Well	Well	Well	Well	Deep probe	Well
SAMPLE DEPTH (mbgs)			1.96-2.74	1.22-1.68	1.96-2.74	1.96-2.74		1.37-1.83	2.74-3.3	1.22-1.52	2.13-3.1	2.13-3.27	2.13-2.97	2.13-2.97	3.05-4.57	2.13-4.27	2.13-2.85	2.13-3.52		2.13-2.85	2.13-3.37	2.13-3.37	1.22-1.52	2.13-3.3	2.13-3.51	2.13-3.51	2.13-2.99	2.13-2.99	2.13-2.99	2.13-3.2	1.07-1.52	2.13-3.0
DATE SAMPLED			10-Mar-11	10-Mar-11	25-Apr-13	24-Apr-13	11-Mar-11	11-Mar-11	08-Mar-11	08-Mar-11	08-Mar-11	10-Nov-12	24-Apr-13	24-Apr-13	11-Mar-11	09-Mar-11	09-Mar-11	10-Nov-12		09-Mar-11	25-Apr-13	25-Apr-13	10-Mar-11	10-Mar-11	9-Nov-12	9-Nov-12	24-Apr-13	24-Apr-13	24-Apr-13	10-Mar-11	10-Mar-11	11-Mar-11
LABORATORY			CARO	CARO	CARO	Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	Test America	CARO	CARO	CARO	CARO		Test America	CARO	Test America	CARO	CARO	CARO	CARO (DUP)	CARO	CARO (DUP)	Test America	CARO	CARO	CARO
MATRIX	CARO RDL 2011	CARO RDL 2012	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Test America MDL	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air
Dibromomethane	0.31	0.29	<0.32	<0.34	<0.33	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34		<0.33	<0.33	<0.33	<0.34	-	-	<0.33	-	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	-	<0.33	<0.34	<0.34
Dichlorodifluoromethane	0.61	0.58	13	9.8	4.3	2.49	7.8	3.6	5.1	2.7	5.1	4.9	4.7	2.65	2	5.6	5.9	5	0.38	2.34	4.2	2.84	8.7	7.8	4.4	<0.59	4.4	<0.89	2.52	2.4	5.7	6.7
Dichlorofluoromethane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.326	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
Diethyl ether	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.424	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
Ethane	-	-	-	-	-	0.37	-	-	-	-	-	-	-	0.658	-	-	-	-	1.14	233	-	1.01	-	-	-	-	-	-	0.672	-	-	-
Ethanol	-	-	-	-	-	ND	-	-	-	-	-	-	-	0.985	-	-	-	-	0.207	39.4	-	2.15	-	-	-	-	-	-	0.708	-	-	-
Ethene	-	-	-	-	-	0.44	-	-	-	-	-	-	-	1.03	-	-	-	-	0.932	122	-	1.01	-	-	-	-	-	-	1.38	-	-	-
Ethyl acetate	1.5	1.4	<1.6	<1.7	<1.7	-	<1.7	<1.6	<2.3	<2.4	<2.3	<1.5	<1.7	-	<1.7	<1.7	<1.6	<1.7	-	-	<1.6	-	<1.6	<1.7	<1.5	<1.5	<2.2	<2.2	-	<1.6	<1.7	<1.7
Ethyl ether	0.61	0.58	<0.65	<0.68	<0.67	-	<0.68	<0.66	<0.93	<0.97	<0.92	<0.62	<0.67	-	<0.66	<0.66	<0.65	<0.67	-	-	<0.65	-	<0.64	<0.68	<0.59	<0.59	<0.89	<0.89	-	<0.65	<0.67	<0.67
Ethyl methacrylate	0.31	0.29	<0.32	<0.34	<0.33	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	-	<0.33	<0.33	<0.33	<0.34	-	-	<0.33	-	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	-	<0.33	<0.34	<0.34
Ethylbenzene	0.31	0.29	22	25	0.43	ND	44	3.2	4.7	1.5	1.9	0.31	1	ND	<0.33	7.3	3.9	<0.34	0.337	9.41	1.4	1.08	1.9	31	0.47	<0.3	1.2	0.53	ND	0.78	22	7
Halocarbon 134A	-	-	-	-	-	3.89	-	-	-	-	-	-	-	ND	-	-	-	-	0.323	ND	-	23.2	-	-	-	-	-	-	1.72	-	-	-
Heptanal	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	1.23	3.34	-	ND	-	-	-	-	-	-	ND	-	-	-
Heptane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.219	23.9	-	ND	-	-	-	-	-	-	ND	-	-	-
Hexachlorobutadiene	0.15	0.14	<0.16	<0.17	<0.33	ND	<0.17	<0.16	<0.23	<0.24	<0.23	<0.15	<0.34	ND	<0.17	<0.17	<0.16	<0.17	0.833	ND	<0.33	ND	<0.16	<0.17	<0.15	<0.15	<0.44	<0.44	ND	<0.16	<0.17	0.5
Hexachloroethane	0.31	0.29	<0.32	<0.34	<1.3	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<1.4	-	<0.33	<0.33	<0.33	<0.34	-	-	<1.3	-	<0.32	<0.34	<0.3	<0.3	<1.8	<1.8	-	<0.33	<0.34	<0.34
Hexanal	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.492	2.59	-	2.75	-	-	-	-	-	-	ND	-	-	-
Hexane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	ND	-	-	-
Indan	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.386	1.56	-	1.62	-	-	-	-	-	-	ND	-	-	-
Indene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.172	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
Isobutane	-	-	-	-	-	0.675	-	-	-	-	-	-	-	4	-	-	-	-	0.187	27.4	-	ND	-	-	-	-	-	-	2.48	-	-	-
Isobutylbenzene	3.1	0.29	<3.2	<3.4	-	ND	<3.4	<3.3	<4.7	<4.8	<4.6	<0.31	-	ND	<3.3	<3.3	<3.3	<0.34	0.438	0.702	-	ND	<3.2	<3.4	<0.3	<0.3	-	-	ND	<3.3	<3.4	<3.4
Isoheptane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.318	13.9	-	ND	-	-	-	-	-	-	ND	-	-	-
Isohexane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.213	20.8	-	ND	-	-	-	-	-	-	ND	-	-	-
Isopentane	-	-	-	-	-	1.12	-	-	-	-	-	-	-	2.18	-	-	-	-	0.428	41.8	-	ND	-	-	-	-	-	-	4.32	-	-	-
Isoprene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.183	3.48	-	ND	-	-	-	-	-	-	ND	-	-	-
Isopropyl alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.52	-	-	-	-	-	-	-	-		-	-	-
Isopropylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.917	-	-	-	-	-	-	-	-		-	-	-
Limonene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26.4	-	-	-	-	-	-	-	-		-	-	-
Methacrylonitrile	-	-	<0.32	<0.34	-	-	<0.34	<0.33	<0.47	<0.48	<0.46	-	-		<0.33	<0.33	<0.33	-	-	-	-	-	<0.32	<0.34	-	-	-	-		<0.33	<0.34	<0.34
Methanol	-	-	-	-	-	1.59	-	-	-	-	-	-	-	11.2	-	-	-	-	-	759	-	17.2	-	-	-	-	-	-	9.12	-	-	-
Methyl acrylate	-	-	<1.6	<1.7	-	-	<1.7	<1.6	<2.3	<2.4	<2.3	-	-	-	<1.7	<1.7	<1.6	-	-	-	-	-	<1.6	<1.7	-	-	-	-	-	<1.6	<1.7	<1.7
Methyl ethyl ketone	0.61	-	2.1	3.4	-	-	20	<0.66	<0.93	1.2	<0.92	-	-	-	<0.66	<0.66	0.88	-	0.451	1.74	-	-	<0.64	2.4	-	-	-	-	-	1.1	<0.67	<0.67
Methyl isobutyl ketone	0.61	-	<0.65	<0.68	-	-	1.1	<0.66	<0.93	<0.97	<0.92	-	-	-	<0.66	<0.66	<0.65	-	0.62	1.52	-	-	<0.64	<0.68	-	-	-	-	-	<0.65	<0.67	<0.67
Methyl methacrylate	0.61	0.58	<0.65	<0.68	<0.67	-	4.1	<0.66	<0.93	<0.97	<0.92	<0.62	<0.67	-	<0.66	<0.66	<0.65	<0.67	-	-	<0.65	-	<0.64	<0.68	<0.59	<0.59	<0.89	<0.89	-	<0.65	<0.67	<0.67
Methyl tert-butyl ether	0.61	0.58	<0.65	<0.68	<0.67	ND	<0.68	<0.66	<0.93	<0.97	<0.92	<0.62	<0.67	ND	<0.66	<0.66	<0.65	<0.67	0.515	ND	<0.65	ND	<0.64	<0.68	<0.59	<0.59	<0.89	<0.89	ND	<0.65	<0.67	<0.67
Methylcyclohexane	0.61	0.58	4.9	1.3	<0.67	ND	0.85	1.6	<0.93	<0.97	0.96	<0.62	<0.67	ND	<0.66	3.1	4.3	<0.67	0.311	26.6	<0.65	ND	2	2.5	<0.59	<0.59	<0.89	<0.89	ND	1.3	1.1	<0.67
Methylcyclopentane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.197	6.12	-	ND	-	-	-	-	-	-	ND	-	-	-
Methylene chloride	3.1	2.9	22	17	<3.3	ND	<3.4	<3.3	<4.7	<4.8	<4.6	<3.1	<3.4	ND	<3.3	5.3	<3.3	<3.4	0.272	0.698	<3.3	ND	3.9	<3.4	<3	<3	<4.4	<4.4	ND	<3.3	13	<3.4
m-Xylene & p-Xylene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.673	32.4	-	4.97	-	-	-	-	-	-	ND	-	-	-
Naphthalene	0.31	0.29	45	12	-	ND	0.64	<0.33	<0.47	<0.48	<0.46	46	-	ND	<0.33	<0.33	1.3	33	0.645	0.923	-	2.14	0.77	0.64	0.47	<0.3	-	-	ND	<0.33	<0.34	2.7
n-Butanol	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.408	3.6	-	ND	-	-	-	-	-	-	ND	-	-	-
n-Butylbenzene	3.1	-	<3.2	<3.4	-	ND	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	ND	<3.3	<3.3	<3.3	-	0.212	ND	-	ND	<3.2	<3.4	-	-	-	-	ND	<3.3	<3.4	<3.4
nC10-nC12 Non-reg. Aromatics	15	-	<16	<17	-	-	<17	<16	<23	<24	<23	-	-	-	<17	<17	<16	-	-	-	-	-	<16	<17	-	-	-	-	-	<16	<17	<17
nC10-nC12 Other Aromatics	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
nC12-nC16 Non-reg. Aromatics	15	-	<16	<17	-	-	<17	<16	<23	<24	<23	-	-	-	<17	<17	<16	-	-	-	-	-	<16	<17	-	-	-	-	-	<16	<17	<17
nC12-nC16 Other Aromatics	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
nC8-nC10 Non-reg. Aromatics	15	-	<16	<17	-	-	<17	<16	<23	<24	<23	-	-	-	<17	21	<16	-	-	-	-	-	<16	<17	-	-	-	-	-	<16	<17	<17
n-Decane	0.92	0.86	1.4	<1	1.8	ND	4.1	<0.99	<1.4	<1.5	<1.4	<1.9	<1	2.13	<1	5.6	7.2	<1	0.451	24.9	4.6	7.35	1.7	1.6	2.2	<1.8	2.8	1.7	1.62	<0.98	2.4	<1
Neopentane	-	-	-	-	<0.33	ND	-	-	-	-	-	-	<0.34	ND	-	-	-	-	0.24	0.31	2.7	ND	-	-	-	-	0.58	<0.44	ND	-	-	-
n-Hexane	3.1	2.9	<3.2	<3.4	<3.3	-	<3.4	<3.3	<4.7	<4.8	<4.6	<3.1	<3.4	-	3.7	<3.3	4.3	<3.4	0.247	32.9	<3.3	-	<3.2	<3.4	<3	<3	<4.4	<4.4	-	<3.3	<3.4	<3.4
n-Hexylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
Nitrobenzene	0.31	0.29	<0.32	<0.34	<0.33	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	-	<0.33	<0.33	<0.33	<0.34	-	-	<0.33	-	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	-	<0.33	<0.34	<0.34
n-Nonane	-	-	-	-	-	ND	-	-	-	-	-	-	-	0.839	-	-	-	-	0.407	13.9	-	1.15	-	-	-	-	-	-	ND	-	-	-
n-Octane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.366	19.9	-	ND	-	-	-	-	-	-	ND	-	-	-
n-Pentane	-	-	-	-	-	ND	-	-	-	-	-	-	-	0.56	-	-	-	-	0.229	73.2	-	0.584	-	-	-	-	-	-	0.621	-	-	-
n-Pentylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
n-Propylbenzene	3.1	-	3.6	3.7	-	ND	4.4	3.6	<4.7	<4.8	<4.6	-	-	ND	<3.3	5	<3.3	-	0.385	1.68	-	ND	<3.2	4.1	-	-	-	-	ND	<3.3	<3.4	3.4
n-Undecane	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.263	13	-	3.07	-	-	-	-	-	-	ND	-	-	-
o-Xylene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.337	20.6	-	2.87	-	-	-	-	-	-	ND	-	-	-
Propane	-	-	-	-	-	ND	-	-	-	-	-	-	-	2.5	-	-	-	-	0.674	177	-	ND	-	-	-	-	-	-	3.29	-	-	-
Propanol	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.653	ND	-	4.01	-	-	-	-	-	-	ND	-	-	-
Propylene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.675	176	-	ND	-	-	-	-	-	-	ND	-	-	-
sec-Butylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
Styrene	0.31	0.29	<0.32	<0.34	<0.33	ND	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	ND	<0.33	<0.33	<0.33	<0.34	0.33	0.409	<0.33	ND	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	ND	<0.33	<0.34	<0.34
t-1-Butyl-3,5-Dimethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
t-1-Butyl-4-Ethylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
tert-1-Butyl-2-Methylbenzene	3.1	-	<3.2	<3.4	-	-	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	-	<3.3	<3.3	<3.3	-	-	-	-	-	<3.2	<3.4	-	-	-	-	-	<3.3	<3.4	<3.4
tert-Butylbenzene	3.1	-	<3.2	<3.4	-	ND	<3.4	<3.3	<4.7	<4.8	<4.6	-	-	ND	<3.3	<3.3	<3.3	-	0.438	ND	-	ND	<3.2	<3.4	-	-	-	-	ND	<3.3	<3.4	<3.4
Tetrachloroethene	1.5	1.4	1.8	<1.7	<1.7	ND	3.4	4.3	<2.3	<2.4	<2.3	<1.5	<1.7	ND	<1.7	5.6	2.3	<1.7	0.526	4.33	<1.6	ND	<1.6	4.7	2.3	<1.5	4.9	<2.2	6.47	<1.6	<1.7	<1.7
Tetrahydrofuran	0.31	0.29	0.42	<0.34	<0.33	-	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	-	<0.33	<0.33	<0.33	<0.34	-	-	0.36	-	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	-	<0.33	0.34	<0.34
Toluene	3.1	2.9	140	78	14	23	610	66	16	32	43	65	<3.4	1.81	3.7	96	46	<3.4	0.292	99.3	4.9	5.98	13	47	15	<3	<4.4	<4.4	2.28	<3.3	5	54
trans-1,2-Dichloroethene	0.31	0.29	<0.32	<0.34	<0.33	ND	<0.34	<0.33	<0.47	<0.48	<0.46	<0.31	<0.34	ND	<0.33	<0.33	<0.33	<0.34	0.594	ND	<0.33	ND	<0.32	<0.34	<0.3	<0.3	<0.44	<0.44	ND	<0.33	<0.34	<0.34
trans-1,3-Dichloropropene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.352	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
trans-2-Butene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.162	7.95	-	ND	-	-	-	-	-	-	ND	-	-	-
trans-2-Heptene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.155	0.812	-	ND	-	-	-	-	-	-	ND	-	-	-
trans-2-Hexene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.201	2.81	-	ND	-	-	-	-	-	-	ND	-	-	-
trans-2-Pentene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.269	6.19	-	ND	-	-	-	-	-	-	ND	-	-	-
trans-3-Heptene	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.305	ND	-	ND	-	-	-	-	-	-	ND	-	-	-
trans-1,4-Dichloro-2-butene	-	0.29	-	-	-	-	-	-	-	-	-	<0.31	-	-	-	-	-	<0.34		-	-	-	-	-	<0.3	<0.3	-	-	-	-	-	-
Trichloroethene	0.092	0.086	<0.097	0.14	<0.17	3.2	<0.1	<0.099	0.42	<0.15	1.5	<0.093	<0.17	11.8	<0.1	<0.1	0.26	<0.1	0.417	0.758	<0.16	ND	<0.097	0.27	0.18	<0.089	0.22	<0.22	17.1	<0.098	<0.1	<0.1
Trichlorofluoromethane	0.31	0.29	3.1	2.3	1	1.19	2.8	0.79	1.3	<0.48	1.3	1.1	0.88	0.978	<0.33	1.8	1.4	1.1	0.431	0.913	0.94	1.22	2.1	1.8	0.92	<0.3	0.98	<0.44	1.04	<0.33	<0.34	1.2
Vinyl acetate	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	1.16	ND		ND	-	-	-	-	-	-	ND	-	-	-
Vinyl bromide	-	-	-	-	-	ND	-	-	-	-	-	-	-	ND	-	-	-	-	0.619	ND		ND	-	-	-	-	-	-	ND	-	-	-
Vinyl chloride	0.61	0.58	<0.65	<0.68	<0.67	ND	<0.68	<0.66	<0.93	<0.97	<0.92	<0.62	<0.67	ND	<0.66	<0.66	<0.65	<0.67	0.186	ND	<0.65	ND	<0.64	<0.68	<0.59	<0.59	<0.89	<0.89	ND	<0.65	<0.67	<0.67
Xylenes (total)	1.5	1.4	110	130	2.6	ND	250	18	30	16	14	1.7	5.4	ND	4	50	27	<1.7	0.5	53	10	7.84	17	180	2.8	1.6	6.2	3.1	ND	7.5	100	44

Notes:
All units in $\mu g/m^3$, unless otherwise noted.
mbgs - metres below ground surface
A denotes deeper well, B denotes shallow well.
DUP - duplicate sample

Sample Location ID			MW10-22					MW11-01B		MW11-02		MW11-03B		MW11-04B			MW11-08				MW11-09				
LAB ID			R103247-25	2110724-11	2110724-12		AUC0212-01	2110724-13	2110724-14	2110724-15	2110724-16	2110724-17	2110724-18	2110724-19	2110724-20	2110724-21	2110724-22	2110724-23		AVK0120-03	2110724-24	2110724-25	2110724-26		AVK0120-02
SAMPLE METHOD			Well	Well	Well		Well	Shallow probe	Deep probe	Shallow probe	Shallow probe	Shallow probe	Deep probe	Shallow probe	Deep probe	Deep probe	Shallow probe	Deep probe		Deep probe	Shallow probe	Shallow probe	Deep probe		Shallow probe
SAMPLE DEPTH (mbgs)			2.13-3.3	2.13-3.35	2.13-3.35		2.13-3.3	1.22-1.83	2.13-2.74	1.07-1.68	2.13-2.74	0.91-1.68	2.13-2.74	1.07-1.68	1.98-2.44	1.98-2.44	1.22-1.83	2.13-2.59		2.13-2.59	1.22-1.83	1.22-1.83	2.13-2.74		1.22-1.83
DATE SAMPLED			09-Mar-11	9-Nov-12	9-Nov-12		09-Mar-11	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12		12-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12		12-Nov-12
LABORATORY			CARO	CARO	CARO (DUP)	Test America	Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO (DUP)	CARO	CARO	Test America	Test America	CARO	CARO (DUP)	CARO	Test America	Test America
MATRIX	CARO RDL 2011	CARO RDL 2012	Air	Air	Air	MDL	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	MDL	Air	Air	Air	Air	MDL	Air
Hydrocarbons																									
nC5-nC8 (total)	150	140	680	<140	<140	-	-	<160	<170	<170	200	330	590	160	<150	160	280	190	-	-	160	<170	330	-	-
nC5-nC8 (aromatic)	3.1	2.9	110	9.5	<2.9	-	-	<3.2	5.3	10	47	120	140	19	4.7	21	92	48	-	-	20	5.3	130	-	-
nC5-nC8 (aliphatic)	150	140	550	<140	<140	-	-	<160	<170	<170	<170	190	460	<160	<150	<160	200	<160	-	-	<160	<170	210	-	-
nC8-nC10 (total)	150	140	880	170	<140	-	-	<160	<170	<170	<170	160	790	<160	<150	<160	160	<160	-	-	<160	200	<160	-	-
nC8-nC10 (aromatic)	15	2.9	29	6	3.5	-	-	3.2	3.3	<3.4	3.3	4.9	40	<3.1	<3	4.9	3.2	<3.2	-	-	5.6	4	<3.3	-	-
nC8-nC10 (aliphatic)	150	140	850	150	<140	-	-	<160	<170	<170	<170	170	760	<160	<150	<160	160	<160	-	-	<160	190	<160	-	-
nC6-nC10 (F1)	310	290	1600	290	<290	-	-	<320	<330	<340	370	490	1400	<310	<290	<330	470	350	-	-	<330	360	490	-	-
nC10-nC12 (total)	150	140	780	260	<140	-	-	<160	<170	<170	<170	<160	<170	<160	<150	<160	<160	<160	-	-	<160	<170	<160	-	-
nC10-nC12 (aromatic)	15	2.9	<16	<2.9	<2.9	-	-	<3.2	<3.3	<3.4	<3.3	<3.3	<3.3	<3.1	<3	<3.3	<3.2	<3.2	-	-	<3.3	<3.3	<3.3	-	-
nC10-nC12 (aliphatic)	150	140	780	260	<140	-	-	<160	<170	<170	<170	<160	<170	<160	<150	<160	<160	<160	-	-	<160	<170	<160	-	-
nC12-nC16 (total)	150	290	360	<290	<290	-	-	<320	<330	<340	<330	<330	<330	<310	<290	<330	<320	<320	-	-	<330	<330	<330	-	-
nC12-nC16 (aromatic)	15	2.9	<16	<2.9	<2.9	-	-	<3.2	<3.3	<3.4	<3.3	<3.3	<3.3	<3.1	<3	<3.3	<3.2	<3.2	-	-	<3.3	<3.3	<3.3	-	-
nC12-nC16 (aliphatic)	150	290	360	<290	<290	-	-	<320	<330	<340	<330	<330	<330	<310	<290	<330	<320	<320	-	-	<330	<330	<330	-	-
nC10-nC16 (total) (F2)	310	290	1200	<290	<290	-	-	<320	<330	<340	<330	<330	<330	<310	<290	<330	<320	<320	-	-	<330	<330	<330	-	-
VHv (6-13)	310	570	1300	<570	<570	-	-	<640	<670	<670	<670	<650	1700	<630	<590	<660	<630	<640	-	-	<650	<660	<660	-	-
VPHv	310	570	1100	<570	<570	-	-	<640	<670	<670	<670	<650	1300	<630	<590	<660	<630	<640	-	-	<650	<660	<660	-	-
Volatile Organic Compounds																									
1,1,1,2-Tetrachloroethane	0.15	0.14	<0.16	1.2	<0.14	-	-	<0.16	1.2	0.47	1.2	1.5	1.5	<0.16	0.53	<0.16	<0.16	0.22	-	-	<0.16	<0.17	<0.16	-	-
1,1,1-Trichloroethane	0.31	0.29	<0.33	<0.29	<0.29	0.456	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	0.64	3.2	ND	<0.33	<0.33	0.56	2.13	ND
1,1,2,2-Tetrachloroethane	0.15	0.14	<0.16	<0.14	<0.14	0.58	ND	<0.16	<0.17	<0.17	<0.17	<0.16	<0.17	<0.16	<0.15	<0.16	<0.16	<0.16	2.69	ND	<0.16	<0.17	<0.16	0.541	ND
1,1,2-Trichloroethane	0.15	0.14	<0.16	<0.14	<0.14	0.456	ND	<0.16	<0.17	<0.17	<0.17	<0.16	<0.17	<0.16	<0.15	<0.16	<0.16	<0.16	0.667	ND	<0.16	<0.17	<0.16	0.426	ND
1,1,2-Trichlorotrifluoroethane	-	-	-	-	-	0.647	ND	-	-	-	-	-	-	-	-	-	-	-	6.1	ND	-	-	-	3.02	ND
1,1-Dichloroethane	0.31	0.29	<0.33	<0.29	<0.29	0.342	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	2.43	ND	<0.33	<0.33	<0.33	1.59	ND
1,1-Dichloroethene	0.092	0.086	<0.098	<0.086	<0.086	0.399	ND	<0.096	<0.1	<0.1	<0.1	<0.098	<0.099	<0.094	0.21	0.2	0.25	0.13	1.44	ND	<0.098	0.1	0.2	1.86	ND
1,2,3-Trichloropropane	0.31	0.29	<0.33	<0.29	<0.29	-	-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	-	-	<0.33	<0.33	<0.33	-	-
1,2,3-Trimethylbenzene	3.1	-	<3.3	-	-	0.811	1.38	-	-	-	-	-	-	-	-	-	-	-	0.836	ND	-	-	-	0.756	ND
1,2,4,5-Tetramethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	0.31	0.29	<0.33	<0.29	<0.29	0.605	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	1.04	ND	<0.33	<0.33	<0.33	0.565	ND
1,2,4-Triethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	0.61	0.58	2.7	2.1	1.3	0.415	5.71	0.64	<0.67	<0.67	<0.67	<0.65	2.7	0.85	1	1.5	0.95	0.8	1.1	ND	1.5	1.6	0.69	0.387	1.48
1,2-Dibromo-3-chloropropane	0.31	0.29	<0.33	<0.29	<0.29	-	-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	-	-	<0.33	<0.33	<0.33	-	-
1,2-Dibromoethane	0.31	0.29	<0.33	<0.29	<0.29	-	-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	-	-	<0.33	<0.33	<0.33	-	-
1,2-Dibromoethane (EDB)	-	-	-	-	-	0.649	ND	-	-	-	-	-	-	-	-	-	-	-	0.93	ND	-	-	-	0.605	ND
1,2-Dichloro-1,1,2,2-tetrafluoroethane	-	-	-	-	-	0.585	ND	-	-	-	-	-	-	-	-	-	-	-	15.5	ND	-	-	-	2.73	ND
1,2-Dichlorobenzene	0.31	0.29	<0.33	<0.29	<0.29	0.503	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	2.42	ND	<0.33	<0.33	<0.33	0.469	ND
1,2-Dichloroethane	0.092	0.086	<0.098	<0.086	<0.086	0.342	ND	<0.096	<0.1	<0.1	<0.1	<0.098	<0.099	<0.094	<0.089	<0.099	<0.095	<0.096	1.7	ND	<0.098	<0.1	<0.099	1.59	ND
1,2-Dichloropropane	0.15	0.14	<0.16	<0.14	<0.14	0.39	ND	<0.16	<0.17	<0.17	<0.17	<0.16	<0.17	<0.16	<0.15	<0.16	<0.16	<0.16	0.445	ND	<0.16	<0.17	<0.16	0.364	ND
1,2-Diethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dimethyl-3-Ethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dimethyl-4-Ethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Triethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	0.61	0.58	1.1	<0.58	<0.58	0.415	2.09	<0.64	<0.67	<0.67	<0.67	<0.65	0.66	<0.63	<0.59	<0.66	<0.63	<0.64	0.979	ND	<0.65	<0.66	<0.66	0.387	0.563
1,3-Butadiene	-	-	-	-	-	0.164	1.56	-	-	-	-	-	-	-	-	-	-	-	1.27	ND	-	-	-	0.764	ND
1,3-Dichlorobenzene	0.31	0.29	<0.33	<0.29	<0.29	0.503	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	1.91	ND	<0.33	<0.33	<0.33	0.469	ND
1,3-Dichloropropane	0.31	0.29	<0.33	<0.29	<0.29	-	-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	-	-	<0.33	<0.33	<0.33	-	-
1,3-Dichloropropene (cis+trans)	0.31	0.29	<0.33	<0.29	<0.29	-	-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	-	-	<0.33	<0.33	<0.33	-	-
1,3-Diethylbenzene	-	-	-	-	-	0.896	ND	-	-	-	-	-	-	-	-	-	-	-	1.62	ND	-	-	-	0.836	ND
1,3-Dimethyl-2-Ethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dimethyl-5-Ethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	0.31	0.29	<0.33	<0.29	<0.29	0.508	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	1.55	ND	<0.33	<0.33	<0.33	0.473	ND
1,4-Diethylbenzene	-	-	-	-	-	0.888	ND	-	-	-	-	-	-	-	-	-	-	-	1.66	ND	-	-	-	0.828	ND
1,4-Dimethyl-2-Ethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dioxane	-	-	-	-	-	0.438	ND	-	-	-	-	-	-	-	-	-	-	-	0.866	ND	-	-	-	0.759	ND
1-Butene/Isobutene	-	-	-	-	-	0.21	58.1	-	-	-	-	-	-	-	-	-	-	-	1.58	ND	-	-	-	0.98	ND
1-Decene	-	-	-	-	-	0.893	ND	-	-	-	-	-	-	-	-	-	-	-	1.7	ND	-	-	-	0.833	ND
1-Heptene	-	-	-	-	-	0.625	9.43	-	-	-	-	-	-	-	-	-	-	-	0.554	ND	-	-	-	0.583	ND
1-Hexene	-	-	-	-	-	0.527	5.22	-	-	-	-	-	-	-	-	-	-	-	1.95	ND	-	-	-	2.46	ND
1-methyl-2-ethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methyl-2-Isopropylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methyl-2-n-Propylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-methyl-3-ethylbenzene	3.1	-	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methyl-3-Isopropylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methyl-3-n-Propylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-methyl-4-ethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methyl-4-Isopropylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methyl-4-n-Propylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylcyclohexene	-	-	-	-	-	0.342	ND	-	-	-	-	-	-	-	-	-	-	-	1.27	ND	-	-	-	0.319	ND
1-Methylcyclopentene	-	-	-	-	-	0.289	0.426	-	-	-	-	-	-	-	-	-	-	-	0.0996	ND	-	-	-	0.27	ND
1-Nonene	-	-	-	-	-	0.804	3.06	-	-	-	-	-	-	-	-	-	-	-	0.909	ND	-	-	-	0.75	ND
1-Octene	-	-	-	-	-	0.201	2.06	-	-	-	-	-	-	-	-	-	-	-	1.39	ND	-	-	-	0.187	ND

Notes:
All units in $\mu g/m^3$, unless otherwise noted.
mbgs - metres below ground surface
A denotes deeper well, B denotes shallow well.
DUP - duplicate sample

Sample Location ID			MW10-22					MW11-01B		MW11-02		MW11-03B		MW11-04B			MW11-08			MW11-09				
LAB ID			R103247-25	2110724-11	2110724-12		AUC0212-01	2110724-13	2110724-14	2110724-15	2110724-16	2110724-17	2110724-18	2110724-19	2110724-20	2110724-21	2110724-22	2110724-23		AVK0120-03	2110724-24	2110724-25	2110724-26		AVK0120-02
SAMPLE METHOD			Well	Well	Well		Well	Shallow probe	Deep probe	Shallow probe	Shallow probe	Shallow probe	Deep probe	Shallow probe	Deep probe	Deep probe	Shallow probe	Deep probe		Deep probe	Shallow probe	Shallow probe	Deep probe		Shallow probe
SAMPLE DEPTH (mbgs)			2.13-3.3	2.13-3.35	2.13-3.35		2.13-3.3	1.22-1.83	2.13-2.74	1.07-1.68	2.13-2.74	0.91-1.68	2.13-2.74	1.07-1.68	1.98-2.44	1.98-2.44	1.22-1.83	2.13-2.59		2.13-2.59	1.22-1.83	1.22-1.83	2.13-2.74		1.22-1.83
DATE SAMPLED			09-Mar-11	9-Nov-12	9-Nov-12		09-Mar-11	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12		12-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12		12-Nov-12
LABORATORY			CARO	CARO	CARO (DUP)	Test America	Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO (DUP)	CARO	CARO	Test America	Test America	CARO	CARO (DUP)	CARO	Test America	Test America
MATRIX	CARO RDL 2011	CARO RDL 2012	Air	Air	Air	MDL	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	MDL	Air	Air	Air	Air	MDL	Air
1-Pentene	-	-	-	-	-	0.219	16.4	-	-	-	-	-	-	-	-	-	-	-	1.37	ND	-	-	-	1.02	ND
1-Undecene	-	-	-	-	-	0.511	ND	-	-	-	-	-	-	-	-	-	-	-	1.05	ND	-	-	-	0.476	ND
2 & 3-Chlorotoluene	-	-	-	-	-	0.879	ND	-	-	-	-	-	-	-	-	-	-	-	3.35	ND	-	-	-	0.819	ND
2,2,3-Trimethylpentane	-	-	-	-	-	0.391	0.701	-	-	-	-	-	-	-	-	-	-	-	0.625	ND	-	-	-	0.364	ND
2,2,4-Trimethylpentane	-	-	-	-	-	0.394	2.22	-	-	-	-	-	-	-	-	-	-	-	0.557	ND	-	-	-	0.368	ND
2,2,5-Trimethylhexane	-	-	-	-	-	0.456	0.624	-	-	-	-	-	-	-	-	-	-	-	0.486	ND	-	-	-	0.425	ND
2,2-Dimethylbutane	-	-	-	-	-	0.279	0.493	-	-	-	-	-	-	-	-	-	-	-	2.46	ND	-	-	-	1.3	ND
2,3,4-Trimethylpentane	-	-	-	-	-	0.272	1.79	-	-	-	-	-	-	-	-	-	-	-	0.334	ND	-	-	-	0.254	ND
2,3-Dimethylbutane	-	-	-	-	-	0.206	1.46	-	-	-	-	-	-	-	-	-	-	-	2.09	ND	-	-	-	0.961	ND
2,3-Dimethylpentane	-	-	-	-	-	0.349	3.54	-	-	-	-	-	-	-	-	-	-	-	0.409	ND	-	-	-	0.326	ND
2,4,4-Trimethyl-1-pentene	-	-	-	-	-	0.384	ND	-	-	-	-	-	-	-	-	-	-	-	1.42	ND	-	-	-	0.358	ND
2,4,4-Trimethyl-2-pentene	-	-	-	-	-	0.399	ND	-	-	-	-	-	-	-	-	-	-	-	0.567	ND	-	-	-	0.372	ND
2,4-Dimethylpentane	-	-	-	-	-	0.346	0.884	-	-	-	-	-	-	-	-	-	-	-	2.27	ND	-	-	-	1.61	ND
2,5-Dimethylhexane	-	-	-	-	-	0.391	0.632	-	-	-	-	-	-	-	-	-	-	-	0.404	ND	-	-	-	0.364	ND
2-Butanone (MEK)	-	0.58	-	<0.58	<0.58	-	-	<0.64	<0.67	<0.67	<0.67	<0.65	<0.66	<0.63	<0.59	<0.66	<0.63	<0.64	2.37	ND	<0.65	<0.66	<0.66	2.29	ND
2-Chlorotoluene	0.61	0.58	<0.65	<0.58	<0.58	-	-	<0.64	<0.67	<0.67	<0.67	<0.65	<0.66	<0.63	<0.59	<0.66	<0.63	<0.64	-	-	<0.65	<0.66	<0.66	-	-
2-Ethyl-1-butene	-	-	-	-	-	0.288	1.23	-	-	-	-	-	-	-	-	-	-	-	5.21	ND	-	-	-	1.34	ND
2-Ethyltoluene	-	-	-	-	-	0.415	1.15	-	-	-	-	-	-	-	-	-	-	-	0.943	ND	-	-	-	0.387	ND
2-Hexanone	-	-	-	-	-	0.236	ND	-	-	-	-	-	-	-	-	-	-	-	1.26	ND	-	-	-	0.22	ND
2-Methyl-1-pentene	-	-	-	-	-	0.25	3.46	-	-	-	-	-	-	-	-	-	-	-	2.7	ND	-	-	-	1.17	ND
2-Methyl-2-butene	-	-	-	-	-	0.191	2.31	-	-	-	-	-	-	-	-	-	-	-	3.29	ND	-	-	-	0.891	ND
2-Methyl-2-pentene	-	-	-	-	-	0.282	0.703	-	-	-	-	-	-	-	-	-	-	-	1.4	ND	-	-	-	1.32	ND
2-Methylbutylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylheptane	-	-	-	-	-	0.394	0.832	-	-	-	-	-	-	-	-	-	-	-	0.489	ND	-	-	-	0.368	ND
3-Ethyltoluene	-	-	-	-	-	0.415	4.42	-	-	-	-	-	-	-	-	-	-	-	1.09	ND	-	-	-	0.387	0.553
3-Methyl-1-butene	-	-	-	-	-	0.206	3.78	-	-	-	-	-	-	-	-	-	-	-	1.93	ND	-	-	-	0.958	ND
3-Methylheptane	-	-	-	-	-	0.763	0.776	-	-	-	-	-	-	-	-	-	-	-	0.382	ND	-	-	-	0.711	ND
3-Methylhexane	-	-	-	-	-	0.292	6.64	-	-	-	-	-	-	-	-	-	-	-	0.429	ND	-	-	-	0.272	ND
3-Methylpentane	-	-	-	-	-	0.256	4.76	-	-	-	-	-	-	-	-	-	-	-	2.5	ND	-	-	-	1.19	ND
4-Chlorotoluene	-	-	-	-	-	0.798	ND	-	-	-	-	-	-	-	-	-	-	-	1.69	ND	-	-	-	0.744	ND
4-Ethyltoluene	-	-	-	-	-	0.411	1.84	-	-	-	-	-	-	-	-	-	-	-	1.28	ND	-	-	-	0.383	ND
4-Isopropyltoluene	-	-	-	-	-	0.889	4.54	-	-	-	-	-	-	-	-	-	-	-	2.27	ND	-	-	-	0.829	ND
4-Methyl-1-pentene	-	-	-	-	-	0.211	1.17	-	-	-	-	-	-	-	-	-	-	-	1.99	ND	-	-	-	0.984	ND
4-Methyl-2-Pentanone (MIBK)	-	0.58	-	<0.58	<0.58	-		<0.64	<0.67	<0.67	<0.67	<0.65	<0.66	<0.63	<0.59	<0.66	<0.63	<0.64	0.942	ND	<0.65	<0.66	<0.66	0.63	ND
4-Nonene	-	-	-	-	-	0.171	2.27	-	-	-	-	-	-	-	-	-	-	-	5.16	ND	-	-	-	0.159	ND
Acetaldehyde	-	-	-	-	-	0.527	11.3	-	-	-	-	-	-	-	-	-	-	-	2.25	ND	-	-	-	2.46	ND
Acetone	3.1	2.9	18	<2.9	3.2	0.172	4.21	<3.2	<3.3	<3.4	<3.3	3.6	9.2	<3.1	<3	<3.3	<3.2	<3.2	1.06	ND	<3.3	<3.3	<3.3	0.801	1.63
Acetonitrile	-	-	-	-	-	0.161	ND	-	-	-	-	-	-	-	-	-	-	-	2.64	ND	-	-	-	0.752	ND
Acetylene	-	-	-	-	-	0.18	0.522	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.803	ND
Acrylonitrile	0.31	0.29	<0.33	<0.29	<0.29	0.661	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	1.68	ND	<0.49	<0.33	<0.33	3.08	ND
Allyl chloride	0.15	0.14	<0.16	<0.14	<0.14	0.26	ND	<0.16	<0.17	<0.17	<0.17	<0.16	<0.17	<0.16	<0.15	<0.16	<0.16	<0.16	2.89	ND	<0.16	<0.17	<0.16	1.21	ND
alpha-Pinene	-	-	-	-	-	0.475	0.754	-	-	-	-	-	-	-	-	-	-	-	0.843	ND	-	-	-	0.443	ND
Benzaldehyde	-	-	-	-	-	0.394	0.541	-	-	-	-	-	-	-	-	-	-	-	1.32	ND	-	-	-	0.368	ND
Benzene	0.15	0.14	1.7	0.78	0.63	0.204	2.49	1.5	1.6	1.8	1.7	3.9	7.6	1.6	1.2	1.1	1.2	0.93	0.404	0.404	1.1	1.4	1.4	0.19	1.82
Benzyl chloride	-	-	-	-	-	1.56	ND	-	-	-	-	-	-	-	-	-	-	-	1.72	ND	-	-	-	1.46	ND
beta-Pinene	-	-	-	-	-	0.47	1.13	-	-	-	-	-	-	-	-	-	-	-	2.17	ND	-	-	-	0.439	ND
Bromobenzene	0.31	0.29	<0.33	<0.29	<0.29	-	-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	-	-	<0.33	<0.33	<0.33	-	-
Bromochloromethane	-	-	-	-	-	0.46	ND												4.23	ND				2.14	ND
Bromodichloromethane	0.15	0.14	<0.16	<0.14	<0.14	0.582	ND	<0.16	<0.17	<0.17	<0.17	<0.16	<0.17	<0.16	<0.15	<0.16	<0.16	<0.16	1.9	ND	<0.16	<0.17	<0.16	0.543	ND
Bromoform	0.31	0.29	<0.33	<0.29	<0.29	0.899	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	1.82	ND	<0.33	<0.33	<0.33	0.838	ND
Bromomethane	-	-	-	-	-	0.328	ND	-	-	-	-	-	-	-	-	-	-	-	3.72	ND	-	-	-	1.53	ND
Butane	-	-	-	-	-	0.176	44.4	-	-	-	-	-	-	-	-	-	-	-	1.32	ND	-	-	-	0.82	ND
Butyl acrylate	-	-	-	-	-	1.51	ND	-	-	-	-	-	-	-	-	-	-	-	2.85	ND	-	-	-	1.4	ND
Butyraldehyde	-	-	-	-	-	0.856	1.69	-	-	-	-	-	-	-	-	-	-	-	2.06	ND	-	-	-	3.99	ND
Carbon disulfide	0.61	0.58	6.2	<0.58	<0.58	0.895	11.2	0.99	<0.67	<0.67	<0.67	2.5	0.66	1.6	0.86	<0.66	1.7	<0.64	4.23	ND	0.88	1.1	1.4	4.17	5.26
Carbon tetrachloride	0.092	0.086	<0.098	<0.086	<0.086	0.531	ND	<0.096	<0.1	0.1	0.13	<0.098	9.9	17	8	<0.099	<0.095	3.2	2.07	2.24	<0.098	16	0.79	0.495	ND
Chlorobenzene	0.31	0.29	<0.33	<0.29	<0.29	0.393	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	0.404	ND	<0.33	4.3	<0.33	0.366	ND
Chlorodifluoromethane	-	-	-	-	-	0.556	0.628	-	-	-	-	-	-	-	-	-	-	-	1.87	ND	-	-	-	2.59	ND
Chloroethane	1.5	1.4	<1.6	<1.4	<1.4	0.158	ND	<1.6	<1.7	<1.7	<1.7	<1.6	<1.7	<1.6	<1.5	<1.6	<1.6	<1.6	1.98	ND	<1.6	<1.7	<1.6	0.738	ND
Chloroform	0.15	0.14	3	<0.14	<0.14	0.412	2.02	<0.16	<0.17	<0.17	<0.17	<0.16	7.3	<0.16	0.15	<0.16	<0.16	0.19	2.44	ND	<0.16	0.23	0.16	1.92	ND
Chloromethane	-	-	-	-	-	0.142	0.822	-	-	-	-	-	-	-	-	-	-	-	0.9	ND	-	-	-	0.661	ND
Chloroprene	-	-	-	-	-	0.217	ND	-	-	-	-	-	-	-	-	-	-	-	2.18	ND	-	-	-	1.01	ND
cis/trans-4-Methyl-2-pentene	-	-	-	-	-	0.587	1.02	-	-	-	-	-	-	-	-	-	-	-	2.46	ND	-	-	-	2.74	ND
cis-1,2-Dichloroethene	0.31	0.29	<0.33	<0.29	<0.29	0.335	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	2.17	ND	<0.33	<0.33	<0.33	1.56	ND
cis-1,3-Dichloropropene	-	-	-	-	-	0.383	ND	-	-	-	-	-	-	-	-	-	-	-	0.58	ND	-	-	-	0.357	ND
cis-2-Butene	-	-	-	-	-	0.185	9.15	-	-	-	-	-	-	-	-	-	-	-	1.22	ND	-	-	-	0.862	ND
cis-2-Hexene	-	-	-	-	-	0.557	1.54	-	-	-	-	-	-	-	-	-	-	-	2.06	ND	-	-	-	2.6	ND
cis-2-Octene	-	-	-	-	-	0.384	0.621	-	-	-	-	-	-	-	-	-	-	-	1.46	ND	-	-	-	0.358	ND
cis-2-Pentene	-	-	-	-	-	0.224	5.25	-	-	-	-	-	-	-	-	-	-	-	2.65	ND	-	-	-	1.05	ND
cis-3-Heptene	-	-	-	-	-	0.142	0.206	-	-	-	-	-	-	-	-	-	-	-	0.948	ND	-	-	-	0.132	ND
cis-3-Hexene	-	-	-	-	-	0.296	0.605	-	-	-	-	-	-	-	-	-	-	-	5.37	ND	-	-	-	1.38	ND
cis-3-Methyl-2-pentene	-	-	-	-	-	0.288	0.325	-	-	-	-	-	-	-	-	-	-	-	1.46	ND	-	-	-	1.34	ND
Cumene	0.31	-	<0.33	-	-	0.803	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	-	0.213	6.56	-	-	-	-	-	-	-	-	-	-	-	0.517	ND	-	-	-	0.198	ND
Cyclohexene	-	-	-	-	-	0.13	0.237	-	-	-	-	-	-	-	-	-	-	-	1.03	ND	-	-	-	0.121	ND
Cyclopentane	-	-	-	-	-	0.194	0.742	-	-	-	-	-	-	-	-	-	-	-	2	ND	-	-	-	0.903	ND
Cyclopentene	-	-	-	-	-	0.184	0.556	-	-	-	-	-	-	-	-	-	-	-	2.15	ND	-	-	-	0.859	ND
Dibromochloromethane	0.31	0.29	<0.33	<0.29	<0.29	0.741	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	2.52	ND	<0.33	<0.33	<0.33	0.691	ND

Notes:
All units in $\mu g/m^3$, unless otherwise noted.
mbgs - metres below ground surface
A denotes deeper well, B denotes shallow well.
DUP - duplicate sample

Sample Location ID			MW10-22					MW11-01B		MW11-02		MW11-03B		MW11-04B			MW11-08			MW11-09					
LAB ID			R103247-25	2110724-11	2110724-12		AUC0212-01	2110724-13	2110724-14	2110724-15	2110724-16	2110724-17	2110724-18	2110724-19	2110724-20	2110724-21	2110724-22	2110724-23		AVK0120-03	2110724-24	2110724-25	2110724-26		AVK0120-02
SAMPLE METHOD			Well	Well	Well		Well	Shallow probe	Deep probe	Shallow probe	Shallow probe	Shallow probe	Deep probe	Shallow probe	Deep probe	Deep probe	Shallow probe	Deep probe		Deep probe	Shallow probe	Shallow probe	Deep probe		Shallow probe
SAMPLE DEPTH (mbgs)			2.13-3.3	2.13-3.35	2.13-3.35		2.13-3.3	1.22-1.83	2.13-2.74	1.07-1.68	2.13-2.74	0.91-1.68	2.13-2.74	1.07-1.68	1.98-2.44	1.98-2.44	1.22-1.83	2.13-2.59		2.13-2.59	1.22-1.83	1.22-1.83	2.13-2.74		1.22-1.83
DATE SAMPLED			09-Mar-11	9-Nov-12	9-Nov-12		09-Mar-11	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	10-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12		12-Nov-12	9-Nov-12	9-Nov-12	9-Nov-12		12-Nov-12
LABORATORY			CARO	CARO	CARO (DUP)	Test America	Test America	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO	CARO (DUP)	CARO	CARO	Test America	Test America	CARO	CARO (DUP)	CARO	Test America	Test America
MATRIX	CARO RDL 2011	CARO RDL 2012	Air	Air	Air	MDL	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	MDL	Air	Air	Air	Air	MDL	Air
Dibromomethane	0.31	0.29	<0.33	<0.29	<0.29	-	-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32			<0.33	<0.33	<0.33	-	-
Dichlorodifluoromethane	0.61	0.58	6.8	4.9	<0.58	0.414	2.02	4.8	4.3	5.4	5	5.2	5	6	6.2	4.6	4.7	4.8	3.5	ND	4.3	7.3	4.9	1.93	ND
Dichlorofluoromethane	-	-	-	-	-	0.355	ND	-	-	-	-	-	-	-	-	-	-	-	3.25	ND	-	-	-	1.66	ND
Diethyl ether	-	-	-	-	-	0.462	ND	-	-	-	-	-	-	-	-	-	-	-	1.46	ND	-	-	-	2.16	ND
Ethane	-	-	-	-	-	1.24	125	-	-	-	-	-	-	-	-	-	-	-			-	-	-	0.456	0.607
Ethanol	-	-	-	-	-	0.225	40.8	-	-	-	-	-	-	-	-	-	-	-	2.94	ND	-	-	-	2.58	3.87
Ethene	-	-	-	-	-	0.203	30.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.543	ND
Ethyl acetate	1.5	1.4	<1.6	<1.4	<1.4	-	-	<1.6	<1.7	<1.7	<1.7	<1.6	<1.7	<1.6	<1.5	<1.6	<1.6	<1.6	-	-	<1.6	<1.7	<1.6	-	-
Ethyl ether	0.61	0.58	<0.65	<0.58	<0.58	-	-	<0.64	<0.67	<0.67	<0.67	<0.65	<0.66	<0.63	<0.59	<0.66	<0.63	<0.64	-	-	<0.65	<0.66	<0.66	-	-
Ethyl methacrylate	0.31	0.29	<0.33	<0.29	<0.29	-	-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	-	-	<0.33	<0.33	<0.33	-	-
Ethylbenzene	0.31	0.29	3.3	0.58	0.43	0.367	8	0.51	0.87	<0.34	0.4	<0.33	2.3	0.34	<0.3	0.56	0.47	<0.32	0.736	ND	0.65	0.66	0.46	0.342	0.56
Halocarbon 134A	-	-	-	-	-	0.352	ND	-	-	-	-	-	-	-	-	-	-	-	6.44	ND	-	-	-	1.64	ND
Heptanal	-	-	-	-	-	1.34	5.69	-	-	-	-	-	-	-	-	-	-	-	1.7	ND	-	-	-	1.25	ND
Heptane	-	-	-	-	-	0.239	2.7	-	-	-	-	-	-	-	-	-	-	-	0.407	ND	-	-	-	0.223	ND
Hexachlorobutadiene	0.15	0.14	<0.16	<0.14	<0.14	0.908	ND	<0.16	<0.17	<0.17	<0.17	<0.16	<0.17	<0.16	<0.15	<0.16	<0.16	<0.16	2	ND	<0.16	<0.17	<0.16	0.847	ND
Hexachloroethane	0.31	0.29	<0.33	<0.29	<0.29	-	-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	-	-	<0.33	<0.33	<0.33	-	-
Hexanal	-	-	-	-	-	0.536	5.39	-	-	-	-	-	-	-	-	-	-	-	1.45	1.47	-	-	-	0.5	1.45
Hexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.34	ND	-	-	-	1.25	ND
Indan	-	-	-	-	-	0.42	0.798	-	-	-	-	-	-	-	-	-	-	-	1.33	ND	-	-	-	0.392	2.53
Indene	-	-	-	-	-	0.187	ND	-	-	-	-	-	-	-	-	-	-	-	0.823	ND	-	-	-	0.174	0.756
Isobutane	-	-	-	-	-	0.204	12.5	-	-	-	-	-	-	-	-	-	-	-	1.83	ND	-	-	-	0.95	ND
Isobutylbenzene	3.1	0.29	<3.3	<0.29	<0.29	0.477	ND	<0.32	<0.33	<0.34	1.9	4.3	1.4	<0.31	<0.3	<0.33	<0.32	<0.32	1.08	ND	<0.33	0.37	<0.33	0.445	ND
Isoheptane	-	-	-	-	-	0.346	4.31	-	-	-	-	-	-	-	-	-	-	-	0.337	ND	-	-	-	0.323	ND
Isohexane	-	-	-	-	-	0.232	8.71	-	-	-	-	-	-	-	-	-	-	-	2.33	ND	-	-	-	1.08	ND
Isopentane	-	-	-	-	-	0.466	18.4	-	-	-	-	-	-	-	-	-	-	-	0.929	ND	-	-	-	2.17	ND
Isoprene	-	-	-	-	-	0.199	1.37	-	-	-	-	-	-	-	-	-	-	-	1.95	ND	-	-	-	0.927	ND
Isopropyl alcohol	-	-	-	-	-	-	0.604	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Limonene	-	-	-	-	-	-	10.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methacrylonitrile	-	-	<0.33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanol	-	-	-	-	-	-	4430	-	-	-	-	-	-	-	-	-	-	-	2.03	7.62	-	-	-	2.32	2.92
Methyl acrylate	-	-	<1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl ethyl ketone	0.61	-	<0.65	-	-	0.491	0.814	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl isobutyl ketone	0.61	-	<0.65	-	-	0.676	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl methacrylate	0.61	0.58	<0.65	<0.58	<0.58	-	-	<0.64	<0.67	<0.67	<0.67	<0.65	<0.66	<0.63	<0.59	<0.66	<0.63	<0.64	-	-	<0.65	<0.66	<0.66	-	-
Methyl tert-butyl ether	0.61	0.58	<0.65	<0.58	<0.58	0.561	ND	<0.64	<0.67	<0.67	<0.67	<0.65	<0.66	<0.63	<0.59	<0.66	<0.63	<0.64	2.39	ND	<0.65	<0.66	<0.66	2.62	ND
Methylcyclohexane	0.61	0.58	2.2	<0.58	<0.58	0.339	16.5	<0.64	<0.67	<0.67	<0.67	<0.65	4	<0.63	0.8	<0.66	<0.63	<0.64	0.583	ND	<0.65	<0.66	<0.66	0.316	ND
Methylcyclopentane	-	-	-	-	-	0.215	4.85	-	-	-	-	-	-	-	-	-	-	-	2.04	ND	-	-	-	1	ND
Methylene chloride	3.1	2.9	4.2	<2.9	<2.9	0.296	ND	<3.2	<3.3	<3.4	<3.3	<3.3	<3.3	<3.1	<3	<3.3	<3.2	<3.2	1.92	ND	<3.3	<3.3	<3.3	1.38	ND
m-Xylene & p-Xylene	-	-	-	-	-	0.733	27.8	-	-	-	-	-	-	-	-	-	-	-	1.61	ND	-	-	-	0.684	1.21
Naphthalene	0.31	0.29	<0.33	0.4	0.52	0.703	1.14	1.8	0.43	<0.34	<0.33	<0.33	<0.33	<0.31	0.3	<0.33	0.32	<0.32	1.33	2.08	<0.33	0.46	<0.33	0.655	1.64
n-Butanol	-	-	-	-	-	0.444	0.838	-	-	-	-	-	-	-	-	-	-	-	0.915	1.8	-	-	-	0.802	7.47
n-Butylbenzene	3.1	-	<3.3	-	-	0.23	1.75	-	-	-	-	-	-	-	-	-	-	-	0.472	ND	-	-	-	0.215	ND
nC10-nC12 Non-reg. Aromatics	15	-	<16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
nC10-nC12 Other Aromatics	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
nC12-nC16 Non-reg. Aromatics	15	-	<16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
nC12-nC16 Other Aromatics	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
nC8-nC10 Non-reg. Aromatics	15	-	<16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Decane	0.92	0.86	<0.98	2.6	<1.7	0.491	4.07	<0.96	<1	<1	<1	<1	<2	<0.99	<1.9	<1.8	<2	<1.9	<1.9	1.2	3.46	2	<2	<2	0.458	5.15
Neopentane	-	-	-	-	-	0.261	ND	-	-	-	-	-	-	-	-	-	-	-	2.2	ND	-	-	-	1.22	ND
n-Hexane	3.1	2.9	<3.3	<2.9	<2.9	0.269	9.63	<3.2	<3.3	<3.4	<3.3	<3.3	5.9	<3.1	<3	<3.3	<3.2	<3.2	-	-	<3.3	<3.3	<3.3	-	-
n-Hexylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	0.31	0.29	<0.33	<0.29	<0.29	-	-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	-	-	<0.33	<0.33	<0.33	-	-
n-Nonane	-	-	-	-	-	0.443	1.84	-	-	-	-	-	-	-	-	-	-	-	0.905	ND	-	-	-	0.413	ND
n-Octane	-	-	-	-	-	0.398	2.37	-	-	-	-	-	-	-	-	-	-	-	0.58	ND	-	-	-	0.372	ND
n-Pentane	-	-	-	-	-	0.249	28.5	-	-	-	-	-	-	-	-	-	-	-	1.2	ND	-	-	-	1.16	ND
n-Pentylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Propylbenzene	3.1	-	3.6	-	-	0.419	1.84	-	-	-	-	-	-	-	-	-	-	-	1.2	ND	-	-	-	0.391	ND
n-Undecane	-	-	-	-	-	0.287	2.19	-	-	-	-	-	-	-	-	-	-	-	0.971	ND	-	-	-	0.268	0.695
o-Xylene	-	-	-	-	-	0.367	10.8	-	-	-	-	-	-	-	-	-	-	-	0.809	ND	-	-	-	0.342	0.691
Propane	-	-	-	-	-	0.147	72.6	-	-	-	-	-	-	-	-	-	-	-	10.7	ND	-	-	-	0.685	ND
Propanol	-	-	-	-	-	0.712	ND	-	-	-	-	-	-	-	-	-	-	-	4.22	ND	-	-	-	3.7	ND
Propylene	-	-	-	-	-	0.147	56.1	-	-	-	-	-	-	-	-	-	-	-	1.43	ND	-	-	-	0.686	ND
sec-Butylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	0.31	0.29	<0.33	<0.29	<0.29	0.36	ND	<0.32	<0.33	<0.34	<0.33	<0.33	6.6	<0.31	<0.3	<0.33	<0.32	<0.32	1.38	ND	<0.33	<0.33	<0.33	0.335	ND
t-1-Butyl-3,5-Dimethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t-1-Butyl-4-Ethylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
tert-1-Butyl-2-Methylbenzene	3.1	-	<3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
tert-Butylbenzene	3.1	-	<3.3	-	-	0.477	ND	-	-	-	-	-	-	-	-	-	-	-	0.522	ND	-	-	-	0.445	ND
Tetrachloroethene	1.5	1.4	3.9	<1.4	<1.4	0.573	11.3	<1.6	<1.7	<1.7	<1.7	<1.6	<1.7	<1.6	<1.5	<1.6	<1.6	<1.6	0.685	ND	<1.6	<1.7	<1.6	0.534	ND
Tetrahydrofuran	0.31	0.29	0.85	0.32	<0.29	-	-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	-	-	<0.33	<0.33	<0.33	-	-
Toluene	3.1	2.9	110	8.6	<2.9	0.318	70.8	<3.2	3.7	8.7	47	120	140	18	3.2	20	92	48	1.76	455	19	4	130	1.48	702
trans-1,2-Dichloroethene	0.31	0.29	<0.33	<0.29	<0.29	0.647	ND	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	3.08	ND	<0.33	<0.33	<0.33	3.02	ND
trans-1,3-Dichloropropene	-	-	-	-	-	0.383	ND	-	-	-	-	-	-	-	-	-	-	-	0.827	ND	-	-	-	0.357	ND
trans-2-Butene	-	-	-	-	-	0.176	3.49	-	-	-	-	-	-	-	-	-	-	-	1.44	ND	-	-	-	0.822	ND
trans-2-Heptene	-	-	-	-	-	0.168	ND	-	-	-	-	-	-	-	-	-	-	-	1.25	ND	-	-	-	0.157	ND
trans-2-Hexene	-	-	-	-	-	0.218	0.737	-	-	-	-	-	-	-	-	-	-	-	1.89	ND	-	-	-	1.02	ND
trans-2-Pentene	-	-	-	-	-	0.293	2.11	-	-	-	-	-	-	-	-	-	-	-	2.14	ND	-	-	-	1.37	ND
trans-3-Heptene	-	-	-	-	-	0.332	ND	-	-	-	-	-	-	-	-	-	-	-	0.729	ND	-	-	-	0.31	ND
trans-1,4-Dichloro-2-butene	-	0.29	-	<0.29	<0.29		-	<0.32	<0.33	<0.34	<0.33	<0.33	<0.33	<0.31	<0.3	<0.33	<0.32	<0.32	-	-	<0.33	<0.33	<0.33	-	-
Trichloroethene	0.092	0.086	0.33	<0.086	<0.086	0.454	ND	0.19	0.17	<0.1	<0.1	<0.098	<0.099	<0.094	0.15	<0.099	<0.095	<0.096	0.439	ND	<0.098	<0.1	<0.099	0.423	ND
Trichlorofluoromethane	0.31	0.29	<0.33	1.1	<0.29	0.47	0.959	0.87	0.97	1.1	1.1	0.52	1.3	2.3	1.9	0.99	2.5	2	2.41	ND	0.92	2	2.1	2.19	ND
Vinyl acetate	-	-	-	-	-	1.26	ND	-	-	-	-	-	-	-	-	-	-	-	4.18	ND	-	-	-	5.88	ND
Vinyl bromide	-	-	-	-	-	0.674	ND	-	-	-	-	-	-	-	-	-	-	-	6.82	ND	-	-	-	3.14	ND
Vinyl chloride	0.61	0.58	<0.65	<0.58	<0.58	0.203	ND	<0.64	<0.67	<0.67	<0.67	<0.65	<0.66	<0.63	<0.59	<0.66	<0.63	<0.64	2.24	ND	<0.65	<0.66	<0.66	0.946	ND
Xylenes (total)	1.5	1.4	22	3.5	2.3	0.544	38.6	2.8	3.2	<1.7	<1.7	<1.6	25	1.7	1.6	3	2.4	<1.6	2.4	ND	3.3	2.2	2.4	0.508	1.9

Notes:
All units in $\mu g/m^3$, unless otherwise noted.
mbgs - metres below ground surface
A denotes deeper well, B denotes shallow well.
DUP - duplicate sample

Table C-2
Soil Vapour Screening
Canada Cresosote Site (North Bow), Calgary, Alberta

Parameter	Residential Soil Vapour Screen (for distance < 1 m) ($\mu g/m^3$)	Derivation of Soil vapour guideline[1]					Carcinogenic										
		Non-carcinogen (with RfC)	Carcinogen (with RsC)	Jurisdiction	RfC	Ca	TRV (Unit Risk for Carcinogens)	Jurisdiction	ILCR	RsC	SAF	BAF	ET	AF	Maximum Measured Soil Vapour Concentration	Ratio Maximum Measured Soil Vapour Concentration / Soil Vapour Screening Guideline	Exceed Soil Vapour Screen?
Units	**α = 0.01**	($\mu g/m^3$)	($\mu g/m^3$)	-	mg/m^3	mg/m^3	$(mg/m^3)^{-1}$	-	-	mg/m^3	-	-	-	-	$\mu g/m^3$		-
Petroleum Hydrocarbon Ranges																	
nC6-nC8 (total)															2300		NA
nC6-nC8 (aromatic)															610		NA
nC6-nC8 (aliphatic)	3.66E+05	3.66E+05		A	18.4	9.11E-02					0.2	1	1	0.01	1700	4.64E-03	No
nC8-nC10 (total)															170000		
nC8-nC10 (aromatic)	3.25E+03	3.25E+03		A	0.2	3.75E-02					0.2	1	1	0.01	76000	2.34E+01	**Yes**
nC8-nC10 Non-reg. Aromatics															71		NA
nC8-nC10 (aliphatic)	1.92E+04	1.92E+04		A	1	3.88E-02					0.2	1	1	0.01	93000	4.84E+00	**Yes**
nC6-nC10 (total)															180000		NA
nC10-nC12 (total)															160000		NA
nC10-nC12 (aromatic)	4.00E+03	4.00E+03		A	0.2						0.2	1	1	0.01	43000	1.08E+01	**Yes**
nC10-nC12 Non-reg. Aromatics															130		NA
nC10-nC12 (aliphatic)	2.00E+04	2.00E+04		A	1						0.2	1	1	0.01	120000	6.00E+00	**Yes**
nC12-nC16 (total)															150000		NA
nC12-nC16 (aliphatic)	2.00E+04	2.00E+04		A	1						0.2	1	1	0.01	150000	7.50E+00	**Yes**
nC10-nC16 (total)															310000		NA
VHv (6-13)															360000		NA
VPHv															330000		NA
																	NA
Volatile Organic Compounds																	
Acetaldehyde	4.55E+01	1.80E+02	4.55E+01	IRIS	0.009		**2.20E-03**	IRIS	1E-06	4.55E-04	0.2	1	1	0.01	19.4	4.27E-01	**Yes**
Acetone	6.20E+05	6.20E+05		RSL	31						0.2	1	1	0.01	37	5.97E-05	No
Acetonitrile	1.20E+03	1.20E+03		IRIS	0.06						0.2	1	1	0.01	0.207	1.73E-04	No
Acetylene															1.53		NA
Benzaldehyde															0.541		NA
Benzene	3.03E+01	6.00E+02	3.03E+01	IRIS	0.03		**0.0033**	A	1E-06	3.03E-04	0.2	1	1	0.01	14.6	4.82E-01	**Yes**
Butadiene (1,3-)	3.33E+00	4.00E+01	3.33E+00	IRIS	0.002		**3.00E-02**	IRIS	1E-06	3.33E-05	0.2	1	1	0.01	30.7	9.21E+00	**Yes**
Butane															514		NA
Butanol (n-)															27.3		NA
Butene (cis-2-)															216		NA
Butene (trans-2-)															51.9		NA
Butene/Isobutene (1-)															598		NA
Butylbenzene (n-)															1.75		NA
Butylbenzene (sec-)															5.2		NA
Butyraldehyde															4.07		NA
Carbon disulfide	1.40E+04	1.40E+04		IRIS	0.7						0.2	1	1	0.01	53.3	3.81E-03	No
Carbon tetrachloride	6.67E+00	6.26E+01	6.67E+00	A	0.00313		**0.015**	A	1E-06	6.67E-05	0.2	1	1	0.01	17	2.55E+00	**Yes**
Chlorodifluoromethane	1.00E+06	1.00E+06		IRIS	50						0.2	1	1	0.01	0.628	6.28E-07	No
Chloroform	4.35E+00	7.69E+02	4.35E+00	A	0.04475	6.30E-03	**0.023**	A	1E-06	4.35E-05	0.2	1	1	0.01	150	3.45E+01	**Yes**
Chloromethane	1.80E+03	1.80E+03		RSL	0.09						0.2	1	1	0.01	1.71	9.50E-04	No
Cumene	3.50E+04	3.50E+04		HC	0.7						0.5	1	1	0.01	1540	4.40E-02	No
Cyclohexane	1.20E+05	1.20E+05		IRIS	6						0.2	1	1	0.01	38.3	3.19E-04	No
Cyclohexene															1.86		NA
Cyclopentane															4.35		NA
Cyclopentene															10.9		NA
Decane (n-)															3600		NA
Dichlorodifluoromethane	2.00E+03	2.00E+03		RSL	0.1						0.2	1	1	0.01	13	6.50E-03	No

Table C-2
Soil Vapour Screening
Canada Cresosote Site (North Bow), Calgary, Alberta

Parameter	Residential Soil Vapour Screen (for distance < 1 m) ($\mu g/m^3$)	Derivation of Soil vapour guideline[1]					Carcinogenic										
		Non-carcinogen (with RfC)	Carcinogen (with RsC)	Jurisdiction	RfC	Ca	TRV (Unit Risk for Carcinogens)	Jurisdiction	ILCR	RsC	SAF	BAF	ET	AF	Maximum Measured Soil Vapour Concentration	Ratio Maximum Measured Soil Vapour Concentration / Soil Vapour Screening Guideline	Exceed Soil Vapour Screen?
Units	**α = 0.01**	($\mu g/m^3$)	($\mu g/m^3$)	-	mg/m^3	mg/m^3	$(mg/m^3)^{-1}$	-	-	mg/m^3	-	-	-	-	$\mu g/m^3$		-
Dichloroethene (1,2-), trans	1.20E+03	1.20E+03		RSL	0.06						0.2	1	1	0.01	4.25	3.54E-03	No
Dichloroethene (cis-1,2-)															4.55		NA
Diethylbenzene (1,3-)															456		NA
Dimethyl-2-Ethylbenzene (1,4-)															6.1		NA
Dimethyl-4-Ethylbenzene (1,2-)															20		NA
Dimethyl-5-Ethylbenzene (1,3-)															5.8		NA
Dimethylbutane (2,2-)															8.66		NA
Dimethylbutane (2,3-)															19.9		NA
Dimethylhexane (2,5-)															6.31		NA
Dimethylpentane (2,3-)															24.5		NA
Dimethylpentane (2,4-)															9.26		NA
Ethane															2250		NA
Ethanol															398		NA
Ethene															812		NA
Ethyl-1-butene (2-)															27.9		NA
Ethylbenzene	1.99E+04	1.99E+04		A	1	7.50E-03					0.2	1	1	0.01	8600	4.33E-01	**Yes**
Ethyltoluene (2-)															1270		NA
Ethyltoluene (3-)															6790		NA
Ethyltoluene (4-)															3910		NA
Halocarbon 134A															23.2		NA
Heptanal															6.3		NA
Heptane															48.1		NA
Heptene (1-)															48.5		NA
Heptene (cis-3-)															19.4		NA
Heptene (trans-2-)															2.12		NA
Heptene (trans-3-)															4.55		NA
Hexachlorobutadiene	4.55E+00		4.55E+00			6.00E-05	**0.022**	A	1E-06	4.55E-05	0.2	1	1	0.01	0.5	1.10E-01	**Yes**
Hexanal															6.22		NA
Hexane (n-)	1.40E+04	1.40E+04		IRIS	0.7						0.2	1	1	0.01	121	8.64E-03	No
Hexene (1-)															132		NA
Hexene (cis-2-)															40.8		NA
Hexene (cis-3-)															19.5		NA
Hexene (trans-2-)															11.6		NA
Indan															14400		NA
Indene															3640		NA
Isobutane															378		NA
Isobutylbenzene															57.7		NA
Isoheptane															53.2		NA
Isohexane															112		NA
Isopentane															383		NA
Isoprene															13.1		NA
Isopropyl alcohol	1.40E+05	1.40E+05		RSL	7						0.2	1	1	0.01	4	2.86E-05	No
Isopropyltoluene (4-)															2020		NA
Limonene															56.8		NA

Table C-2
Soil Vapour Screening
Canada Cresosote Site (North Bow), Calgary, Alberta

Parameter	Residential Soil Vapour Screen (for distance < 1 m) ($\mu g/m^3$)	Derivation of Soil vapour guideline[1]					Carcinogenic										
		Non-carcinogen (with RfC)	Carcinogen (with RsC)	Jurisdiction	RfC	Ca	TRV (Unit Risk for Carcinogens)	Jurisdiction	ILCR	RsC	SAF	BAF	ET	AF	Maximum Measured Soil Vapour Concentration	Ratio Maximum Measured Soil Vapour Concentration / Soil Vapour Screening Guideline	Exceed Soil Vapour Screen?
Units	**α = 0.01**	($\mu g/m^3$)	($\mu g/m^3$)	-	mg/m^3	mg/m^3	$(mg/m^3)^{-1}$	-	-	mg/m^3	-	-	-	-	$\mu g/m^3$		-
Methanol	4.32E+04	4.32E+04		A	2.2	4.00E-02					0.2	1	1	0.01	4430	1.03E-01	**Yes**
Methyl ethyl ketone	1.00E+05	1.00E+05		IRIS	5						0.2	1	1	0.01	20	2.00E-04	No
Methyl isobutyl ketone	6.00E+04	6.00E+04		IRIS	3						0.2	1	1	0.01	1.52	2.53E-05	No
Methyl methacrylate	1.04E+03	1.04E+03		A	0.052	2.44E-07					0.2	1	1	0.01	4.1	3.94E-03	No
Methyl-1-butene (3-)															113		NA
Methyl-1-pentene (2-)															94.8		NA
Methyl-1-pentene (4-)															44.3		NA
Methyl-2-butene (2-)															38.5		NA
methyl-2-ethylbenzene (1-)															20		NA
Methyl-2-n-Propylbenzene (1-)															3.5		NA
Methyl-2-pentene (2-)															7.37		NA
Methyl-2-pentene (cis/trans-4-)															12.2		NA
Methyl-2-pentene (cis-3-)															7.84		NA
methyl-3-ethylbenzene (1-)															39		NA
Methyl-3-n-Propylbenzene (1-)															8.4		NA
methyl-4-ethylbenzene (1-)															6.2		NA
Methylcyclohexane															160		NA
Methylcyclohexene (1-)															1.28		NA
Methylcyclopentane															24.9		NA
Methylcyclopentene (1-)															3.82		NA
Methylene chloride	4.35E+03	5.99E+04	4.35E+03	A	3	6.30E-03	**0.000023**	A	1E-06	4.35E-02	0.2	1	1	0.01	22	5.06E-03	No
Methylheptane (2-)															466		NA
Methylheptane (3-)															193		NA
Methylhexane (3-)															73		NA
Methylpentane (3-)															101		NA
Naphthalene	2.94E+00	4.10E+01	2.94E+00	A	0.003	9.50E-04	0.034	RSL	1E-06	2.94E-05	0.2	1	1	0.01	32000	1.09E+04	**Yes**
Neopentane															3.52		NA
Nonane (n-)	4.00E+03	4.00E+03		RSL	0.2						0.2	1	1	0.01	4500	1.13E+00	**Yes**
Nonene (1-)															587		NA
Nonene (4-)															15.8		NA
Octane (n-)															3140		NA
Octene (1-)															236		NA
Octene (cis-2-)															96.9		NA
Pentane (n-)	2.00E+04	2.00E+04		RSL	1						0.2	1	1	0.01	436	2.18E-02	No
Pentene (1-)															395		NA
Pentene (cis-2-)															112		NA
Pentene (trans-2-)															31.8		NA
Pinene (alpha-)															13000		NA
Pinene (beta-)															510		NA
Propane															1350		NA
Propanol															55.4		NA
Propylbenzene (n-)	2.00E+04	2.00E+04		RSL	1						0.2	1	1	0.01	590	2.95E-02	No
Propylene	6.00E+04	6.00E+04		RSL	3						0.2	1	1	0.01	919	1.53E-02	No
Styrene	1.83E+03	1.83E+03		A	0.092	2.80E-04					0.2	1	1	0.01	25	1.36E-02	No
Tetrachloroethene	7.20E+03	7.20E+03		A	0.36						0.2	1	1	0.01	228	3.17E-02	No
Tetrahydrofuran															1		NA
Tetramethylbenzene (1,2,4,5-)															9.7		NA
Toluene	7.51E+04	7.51E+04		A	3.8	4.42E-02					0.2	1	1	0.01	1040	1.38E-02	No
Trichlorobenzene (1,2,4-)	1.04E+02	1.04E+02		A	0.007	1.80E-03					0.2	1	1	0.01	0.86	8.27E-03	No

Table C-2
Soil Vapour Screening
Canada Cresosote Site (North Bow), Calgary, Alberta

Parameter	Residential Soil Vapour Screen (for distance < 1 m) ($\mu g/m^3$)	Derivation of Soil vapour guideline[1]					Carcinogenic										
		Non-carcinogen (with RfC)	Carcinogen (with RsC)	Jurisdiction	RfC	Ca	TRV (Unit Risk for Carcinogens)	Jurisdiction	ILCR	RsC	SAF	BAF	ET	AF	Maximum Measured Soil Vapour Concentration	Ratio Maximum Measured Soil Vapour Concentration / Soil Vapour Screening Guideline	Exceed Soil Vapour Screen?
Units	**α = 0.01**	($\mu g/m^3$)	($\mu g/m^3$)	-	mg/m^3	mg/m^3	$(mg/m^3)^{-1}$	-	-	mg/m^3	-	-	-	-	$\mu g/m^3$		-
Trichloroethene	1.64E+02	7.72E+02	1.64E+02	A	0.04	1.40E-03	**0.00061**	A	1E-06	1.64E-03	0.2	1	1	0.01	17.1	1.04E-01	**Yes**
Trichlorofluoromethane	1.40E+04	1.40E+04		RSL	0.7						0.2	1	1	0.01	3.1	2.21E-04	No
Trichlorotrifluoroethane (1,1,2-)	6.00E+05	6.00E+05		RSL	30						0.2	1	1	0.01	0.72	1.20E-06	No
Trimethyl-1-pentene (2,4,4-)															0.516		NA
Trimethylbenzene (1,2,3-)	1.00E+02	1.00E+02		RSL	0.005						0.2	1	1	0.01	2140	2.14E+01	**Yes**
Trimethylbenzene (1,2,4-)	1.40E+02	1.40E+02		RSL	0.007						0.2	1	1	0.01	10700	7.64E+01	**Yes**
Trimethylbenzene (1,3,5-)															7300		NA
Trimethylhexane (2,2,5-)															19.6		NA
Trimethylpentane (2,2,3-)															6.86		NA
Trimethylpentane (2,2,4-)															6.18		NA
Trimethylpentane (2,3,4-)															22.2		NA
Undecane (n-)															1440		NA
Undecene (1-)															5.84		NA
Vinyl chloride	1.14E+01	2.00E+03	1.14E+01	A	0.1		**0.0088**	A	1E-06	1.14E-04	0.2	1	1	0.01	0.214	1.88E-02	No
Xylene (m- & p-)	2.00E+03	2.00E+03		RSL	0.1						0.2	1	1	0.01	20700	1.04E+01	Yes
Xylene (o-)	2.00E+03	2.00E+03		RSL	0.1						0.2	1	1	0.01	8260	4.13E+00	**Yes**
Xylenes (total)	3.56E+03	3.56E+03		A	0.18	1.82E-03					0.2	1	1	0.01	33000	9.26E+00	**Yes**
nC12-nC16 (aromatic)	1.00E+04	1.00E+04		A	0.2						0.5	1	1	0.01	1200	1.20E-01	**Yes**
1,1,1,2-Tetrachloroethane	1.35E+01		1.35E+01				0.0074	IRIS	1E-06	1.35E-04		1	1	0.01	4.6	3.40E-01	**Yes**
1,1,1-Trichloroethane	1.00E+05	1.00E+05		IRIS	5						0.2	1	1	0.01	0.64	6.40E-06	No
1,1-Dichloroethene	4.00E+03	4.00E+03		A	0.2						0.2	1	1	0.01	0.25	6.25E-05	No
1,2,4-Triethylbenzene															12000		NA
1,4-Diethylbenzene															209		NA
Bromodichloromethane	2.70E+00		2.70E+00				0.037	RSL	1E-06	2.70E-05		1	1	0.01	0.6	2.22E-01	**Yes**
Chlorobenzene	1.97E+02	1.97E+02		A	0.01	1.60E-04					0.2	1	1	0.01	4.3	2.18E-02	No

Notes:

Table to be read in conjunction with accompanying report. See Section 3.2.4 for information and equations used in Soil Vapour Guideline Development.

Where both non-carcinogenic and carcinogenic guidelines were calculated, the most conservative guideline was applied.

TRV - Toxicological Reference Value

A - Alberta Environment Tier 1 Soil and Groundwater Remediation Guidelines, Appendix C: Protocols for Calculating Tier 1 Soil and Groundwater Remediation Guidelines, Table C-7: Human TRVs (December 2010).

HC - Health Canada Contaminated Sites Program, Federal Contaminated Sites Risk Assessment in Canada, Part II: Health Canada Toxicological Reference Values (TRVs) and Chemical-specific factors (September 2010).

IRIS - US Environmental Protection Agency (US EPA) Integrated Risk Information Systems (IRIS), A-Z List of Substances (accessed October 2013).

RSL - US Environmental Protection Agency (US EPA) Regional Screening Levels (RSL), Residential Air Supporting Tables (updated May 2013).

RfC = reference air concentration (mg/m^3)

RsC = risk specific concentration (mg/m^3)

Ca = background indoor/outdoor air concentration (mg/m^3)

SAF = soil vapour allocation factor (unitless)

BAF = biodegradation adjustment factor (10, if eligible; assumed to be not eligible for all compounds)

ET = Exposure term (unitless)

AF = attenuation factor between soil vapour and indoor air (unitless)

ILCR - Incremental Lifetime Cancer Risk (unitless)

µg/m3 - micrograms per cubic metre.

mg/m^3 - miligrams per cubic metre.

Values of 0 and 0.2 were assumed for Ca and SAF, respectively, for TRVs from US EPA IRIS or RSL.

APPENDIX D

Exposure Dose and Risk Calculations

HEALTH CANADA DQRA SPREADSHEET
USER INPUT SHEET

User Name:		Site:	
Proponent:		File #:	
Date:		Comment:	

PROBLEM FORMULATION

Potential Land Uses (Yes/No)

		Default
Agricultural	No	Yes
Residential/urban parkland	Yes	Yes
Commercial	No	Yes
Industrial	No	Yes
Occupational - Outdoors	No	Yes
Recreational	No	Yes
Other		No
specify:		

Exposure Scenario

	Residential	Residential

Receptor Groups (Yes/No)

		Default
General public or residents		Yes
Employees		Yes
Canadian native communities		No
Other		No
specify:		

Operative Pathways (Yes/No)

		Default
Inadvertent ingestion of soil	No	Yes
Inhalation of soil particles	No	Yes
Inhalation of indoor contaminant vapours	Yes	Yes
Inhalation of outdoor contaminant vapours	No	Yes
Ingestion of drinking water	No	Yes
Dermal contact with soil	No	Yes
Dermal contact with water	No	Yes
Ingestion of contaminated food		No

Vapour Transport Modelling

Vapour source for exposure calculations	Subslab (shallow) Vapou	Most Conservative
Model applied for soil to indoor air		Health Canada
Model applied for groundwater to indoor air		Health Canada
Model applied for soil vapour to indoor air		Health Canada

Active Critical Receptors (Yes/No)

		Default
Infant	No	Yes
Toddler	Yes	Yes
Child	No	Yes
Teen	No	Yes
Adult	Yes	Yes
Other		No
specify:		

Contaminant Concentrations

Chemical Name	required	F2	Naphthalene	Benzene	Bromodichloromethane	Carbon tetrachloride	Trichloroethylene (TCE)
Soil (mg/kg)	required						
Mole Fraction in Soil (unitless)	optional						
Groundwater - source (mg/L)	optional						
Mole Fraction in Groundwater (unitless)	optional						
Drinking water (mg/L)	optional						
Bathing/swimming water (mg/L)	optional						
Indoor air - vapours (mg/m^3)	optional						
Outdoor air - vapours (mg/m^3)	optional						
Outdoor air - particulate (mg/m^3)	optional						
Soil vapours (> 1 m below foundation) (mg/m3)	optional						
Subslab/shallow soil vapour (<1 m) (mg/m3)	optional	310	32	0.0146	0.0006	0.017	0.0171
Root vegetables (mg/kg wet weight)	optional						
Other vegetables (mg/kg wet weight)	optional						
Fish (mg/kg wet weight)	optional						
Wild game (mg/kg wet weight)	optional						

See also PHC Sheet

Risk Assessment Endpoints

		Default
Acceptable hazard index:		0.2
Acceptable cancer risk:		1.00E-05

Precluding Conditions for Fate and Transport Models

Are non-aqueous phase liquids (NAPL) present?	No
Is groundwater contamination present in fractured bedrock?	No
Is groundwater contamination migrating through a confined aquifer?	No
Is there active pumping or drawdown of groundwater at the site?	No
Is contamination present within 1 m of building foundation?	No
Do any buildings within 5 m of contamination have earthen foundations?	No
Are any buildings constructed on very high permeability media?	No
Are there preferential vapour flow pathways connecting contamination to a building?	No

Fate and Transport Model Input

	Value	Default	Models Affected
Soil Type		coarse-grained	PS, V-H, V-C, V-O, GW
Significant vehicle traffic on unpaved roads?		No	P-O
Site Characteristics			
Source Length (m)		10	GW, V-O
Source Width (m)		10	GW, V-O
Depth to Groundwater (m)		3	GW, V-O
Depth from Surface to Contamination (m)		0	GW, V-O
Thickness of Contamination (m)		3	GW
Distance - Contaminated Soil to Building (m)		1	V-H, V-C
Distance - Contaminated GW to Building (m)		1	V-H, V-C
Depth Below Building to Vapour Sample (m)		1	V-H, V-C
Distance to potable water user (m)		0	GW
Distance to Bathing/Swimming Water (m)		0	GW
Particulate Concentration in Air (ug/m^3)		0.76	P-O
Hydrological Parameters			
Recharge (m/y)		0.28	GW
Soil/Groundwater Characteristics	coarse-grained		
Vadose Zone			
Dry Bulk Density (g/cm3)		1.700	PS, V-C
Water Content (g/g dry wt)		0.070	PS, V-C
Capillary Zone			
Thickness of Capillary Zone (cm)		5	V-C
Water Content (g/g dry wt)		0.070	V-C
Aquifer/Contaminated Zone			
Saturated Hydraulic Conductivity (m/y)		320	GW
Hydraulic Gradient (m/m)		0.028	GW
Organic Carbon Fraction (g/g)		0.005	PS, GW
Soil Temperature (^{o}C)		21	PS, PGW
Depth of unconfined aquifer (m)		5	GW
Vapour Transport Properties			
Soil Vapour Permeability (cm^2) - CCME model		6.00E-08	V-C
Building Type		Residential - Slab on Grade	V-H, V-C
Building Characteristics	Residential - Slab on Grade		
Building length (m)		12.25	V-C
Building width (m)		12.25	V-C
Building mixing height (m)		3.6	V-H, V-C
Thickness of building foundation (cm)		11.25	V-C
Depth to base of foundation (m)		0.1125	V-C
Air exchanges per hour		0.5	V-C
Pressure differential (Pa)		40	V-C
Crack Area (cm^2)		994.5	V-C
Additional Vapour Intrusion Parameters (Health Canada model)			
Apply biodegradation adjustment?		No	V-H
Apply groundwater mass flux check?		No	V-H
Apply source depletion check?		No	V-H
Additional Groundwater Model Parameters			
Apply biodegradation during transport?		No	GW

Optional Sections

User-defined Chemicals

Note: user-defined chemicals should be named in this section before being selected in the 'Contaminant Concentrations' table above

		Chemical 1		Chemical 2	Chemical 3
Name		Bromodichloromethane	*Health Canada values*		
CAS Number			75-27-4		
Chemical class (organic/inorganic)			organic		
Tolerable daily intake (mg/kg/d) - infant	*Enter all applicable and appropriate toxicity benchmarks; values must be referenced and justified in the PQRA report.*				
Tolerable daily intake (mg/kg/d) - toddler					
Tolerable daily intake (mg/kg/d) - child					
Tolerable daily intake (mg/kg/d) - teen					
Tolerable daily intake (mg/kg/d) - adult					
Tolerable concentration (mg/m^3)					
Oral slope factor $(mg/kg/d)^{-1}$					
Inhalation slope factor $(mg/kg/d)^{-1}$					
Inhalation unit risk $(mg/m^3)^{-1}$			0.037		
Relative dermal absorption factor			0.03		
Organic carbon partitioning coefficient (mL/g) - Koc			83.17637711		
Log Kow (unitless)			2.1		
Henry's Law constant at 25°C (unitless) - H'			0.097944255		
Henry's Law constant at 25°C (atm-m3/mol) - H			0.00239625		
Water Solubility at 25°C (mg/L)			4500		
Molecular Weight (g/mol)			163.829		
Diffusivity in air (cm2/s)			0.0298		
Diffusivity in water (cm2/s)			0.0000106		
Vapour Pressure at 25°C (atm)			0.065827782		
Normal Boiling Point (K) - optional			363.15		
Critical Temperature (K) - optional			585.85		
Enthalpy of Vaporization @ Boiling Point (cal/mol) - optional			7800		
Biodegradation Adjustment Factor (unitless)			1		
Half-Life - unsaturated zone (days)					
Half-Life - saturated zone (days)					

Note: values in grayed cells will not be used; Health Canada default values are applied.

User-defined Receptor

Name		Defaults
Age group		Toddler
Body weight (kg)		16.5
Soil ingestion rate (g/d)		0.08
Inhalation rate (m^3/d)		9.3
Water ingestion rate (L/d)		0.6
Skin surface area (cm^2)		
- hands		430
- arms		890
- legs		1690
- total		6130
Soil loading to exposed skin (g/cm^2/event)		
- hands		0.0001
- surfaces other than hands		0.00001
Food ingestion (g/d)		
- root vegetables		105
- other vegetables		67
- fish		56
- wild game		0
Evaluate Cancer Risks (Yes/No)?		No

User-defined Land-Use / Exposure Scenario

Scenario name	User-Defined	Defaults
Hours per day (indoors)		22.5
Hours per day (outdoors)		1.5
Days per week		7
Weeks per year		52
Dermal exposure events/day		1
Water contact events per day		1
Duration of water contact event (h)		1
Days/year contaminated food ingestion		365
Exposure duration (years)		60
Years for carcinogen amortization		60

SUMMARY OF DQRA RESULTS Version: May 1, 2009

User Name: **Site:**
Proponent: **File #:**
Date: **Comment:**

		Maximum Hazard/Risk Estimates					
		F2	**Naphthalene**	**Benzene**	**Bromodichloromethane**	**Carbon tetrachloride**	**Trichloroethylene (TCE)**
Hazard Quotient - Oral/Dermal		NA	NA	NA	NA	NA	NA
Hazard Quotient - Inhalation		3.23E+00	1.00E+02	4.56E-03	NA	5.09E-02	4.01E-03
Hazard Index - Total		3.23E+00	1.00E+02	4.56E-03	NA	5.09E-02	4.01E-03
Target Hazard Index:	0.2	**Target Hazard Index Exceeded**	**Target Hazard Index Exceeded**				
Cancer Risk - Oral		NA	NA	NA	NA	NA	NA
Cancer Risk - Dermal		NA	NA	NA	NA	NA	NA
Cancer Risk - Oral + Dermal		NA	NA	NA	NA	NA	NA
Cancer Risk - Inhalation		NA	1.02E-02	4.52E-07	2.08E-07	2.39E-06	9.78E-08
Cancer Risk - Total		NA	1.02E-02	4.52E-07	2.08E-07	2.39E-06	9.78E-08
Target Cancer Risk:	1.00E-05		**Target Cancer Risk Exceeded**				

	Critical Receptors					
	F2	**Naphthalene**	**Benzene**	**Bromodichloromethane**	**Carbon tetrachloride**	**Trichloroethylene (TCE)**
Oral/Dermal - non-cancer effects	NA	NA	NA	NA	NA	NA
Inhalation - non-cancer effects	All Age Groups	All Age Groups	All Age Groups	NA	All Age Groups	All Age Groups
Total - non-cancer effects	All Age Groups	All Age Groups	All Age Groups	NA	All Age Groups	All Age Groups
Oral - cancer effects	NA	NA	NA	NA	NA	NA
Dermal - cancer effects	NA	NA	NA	NA	NA	NA
Oral + Dermal - cancer effects	NA	NA	NA	NA	NA	NA
Inhalation - cancer effects	NA	Adult	Adult	Adult	Adult	Adult
Total - cancer effects	NA	Adult	Adult	Adult	Adult	Adult
Source of indoor air vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours
Model used for vapour transport	Fixed alpha	Fixed alpha	Fixed alpha	Fixed alpha	Fixed alpha	Fixed alpha

Key Calculated Model Parameters						
Vapour Intrusion Model Parameters	Note: parameters show as "NA" if relevant exposure pathways are inoperative or if user-input concentration is used instead of modelled value					
Qsoil/Qbuilding	2.22E-03	2.22E-03	2.22E-03	1.55E-03	2.22E-03	2.22E-03
Soil alpha	2.83E-03	2.83E-03	2.83E-03	2.83E-03	2.83E-03	2.83E-03
Groundwater alpha	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03
Soil vapour alpha	2.83E-03	2.83E-03	2.83E-03	2.83E-03	2.83E-03	2.83E-03
Groundwater model dilution factors						
DF1 (soil to leachate)	NA	NA	NA	NA	NA	NA
DF2 (leachate at source to water table):	NA	NA	NA	NA	NA	NA
DF3 (leachate at water table to groundwater):	NA	NA	NA	NA	NA	NA
DF4 (source to receptor) - drinking water:	NA	NA	NA	NA	NA	NA
DF4 (source to receptor) - bathing/swimming water:	NA	NA	NA	NA	NA	NA

Notes/Comments

Vapour Intrusion Model

Chemical Interactions
All chemicals of concern present at the site should be evaluated for potential additive effects based on target organs and mechanisms of effect.

Concentration Checks

Precluding Conditions

Other Notes

HEALTH CANADA DQRA SPREADSHEET
USER INPUT SHEET

User Name:		Site:	
Proponent:		File #:	
Date:		Comment:	

PROBLEM FORMULATION

Potential Land Uses (Yes/No)		Default
Agricultural	No	Yes
Residential/urban parkland	Yes	Yes
Commercial	No	Yes
Industrial	No	Yes
Occupational - Outdoors	No	Yes
Recreational	No	Yes
Other		No
specify:		

Exposure Scenario		
	Residential	Residential

Receptor Groups (Yes/No)		Default
General public or residents		Yes
Employees		Yes
Canadian native communities		No
Other		No
specify:		

Operative Pathways (Yes/No)		Default
Inadvertent ingestion of soil	No	Yes
Inhalation of soil particles	No	Yes
Inhalation of indoor contaminant vapours	Yes	Yes
Inhalation of outdoor contaminant vapours	No	Yes
Ingestion of drinking water	No	Yes
Dermal contact with soil	No	Yes
Dermal contact with water	No	Yes
Ingestion of contaminated food		No

Vapour Transport Modelling		
Vapour source for exposure calculations	Subslab (shallow) Vapou	Most Conservative
Model applied for soil to indoor air		Health Canada
Model applied for groundwater to indoor air		Health Canada
Model applied for soil vapour to indoor air		Health Canada

Active Critical Receptors (Yes/No)		Default
Infant	No	Yes
Toddler	Yes	Yes
Child	No	Yes
Teen	No	Yes
Adult	Yes	Yes
Other		No
specify:		

Contaminant Concentrations

Chemical Name	required	Acetaldehyde	Butadiene, 1,3-	Chloroform	Ethylbenzene		
Soil (mg/kg)	required						
Mole Fraction in Soil (unitless)	optional						
Groundwater - source (mg/L)	optional						
Mole Fraction in Groundwater (unitless)	optional						
Drinking water (mg/L)	optional						
Bathing/swimming water (mg/L)	optional						
Indoor air - vapours (mg/m^3)	optional						
Outdoor air - vapours (mg/m^3)	optional						
Outdoor air - particulate (mg/m^3)	optional						
Soil vapours (> 1 m below foundation) (mg/m3)	optional						
Subslab/shallow soil vapour (<1 m) (mg/m3)	optional	0.0194	0.0307	0.15	8.6		
Root vegetables (mg/kg wet weight)	optional						
Other vegetables (mg/kg wet weight)	optional						
Fish (mg/kg wet weight)	optional						
Wild game (mg/kg wet weight)	optional						

Risk Assessment Endpoints		Default
Acceptable hazard index:		0.2
Acceptable cancer risk:		1.00E-05

Precluding Conditions for Fate and Transport Models

Are non-aqueous phase liquids (NAPL) present?	No
Is groundwater contamination present in fractured bedrock?	No
Is groundwater contamination migrating through a confined aquifer?	No
Is there active pumping or drawdown of groundwater at the site?	No
Is contamination present within 1 m of building foundation?	No
Do any buildings within 5 m of contamination have earthen foundations?	No
Are any buildings constructed on very high permeability media?	No
Are there preferential vapour flow pathways connecting contamination to a building?	No

Fate and Transport Model Input

	Value	Default	Models Affected
Soil Type		coarse-grained	PS, V-H, V-C, V-O, GW
Significant vehicle traffic on unpaved roads?		No	P-O
Site Characteristics			
Source Length (m)		10	GW, V-O
Source Width (m)		10	GW, V-O
Depth to Groundwater (m)		3	GW, V-O
Depth from Surface to Contamination (m)		0	GW, V-O
Thickness of Contamination (m)		3	GW
Distance - Contaminated Soil to Building (m)		1	V-H, V-C
Distance - Contaminated GW to Building (m)		1	V-H, V-C
Depth Below Building to Vapour Sample (m)		1	V-H, V-C
Distance to potable water user (m)		0	GW
Distance to Bathing/Swimming Water (m)		0	GW
Particulate Concentration in Air (ug/m^3)		0.76	P-O
Hydrological Parameters			
Recharge (m/y)		0.28	GW
Soil/Groundwater Characteristics	coarse-grained		
Vadose Zone			
Dry Bulk Density (g/cm3)		1.700	PS, V-C
Water Content (g/g dry wt)		0.070	PS, V-C
Capillary Zone			
Thickness of Capillary Zone (cm)		5	V-C
Water Content (g/g dry wt)		0.070	V-C
Aquifer/Contaminated Zone			
Saturated Hydraulic Conductivity (m/y)		320	GW
Hydraulic Gradient (m/m)		0.028	GW
Organic Carbon Fraction (g/g)		0.005	PS, GW
Soil Temperature (^{o}C)		21	PS, PGW
Depth of unconfined aquifer (m)		5	GW
Vapour Transport Properties			
Soil Vapour Permeability (cm^2) - CCME model		6.00E-08	V-C
Building Type		Residential - Slab on Grade	V-H, V-C
Building Characteristics	Residential - Slab on Grade		
Building length (m)		12.25	V-C
Building width (m)		12.25	V-C
Building mixing height (m)		3.6	V-H, V-C
Thickness of building foundation (cm)		11.25	V-C
Depth to base of foundation (m)		0.1125	V-C
Air exchanges per hour		0.5	V-C
Pressure differential (Pa)		40	V-C
Crack Area (cm^2)		994.5	V-C
Additional Vapour Intrusion Parameters (Health Canada model)			
Apply biodegradation adjustment?		No	V-H
Apply groundwater mass flux check?		No	V-H
Apply source depletion check?		No	V-H
Additional Groundwater Model Parameters			
Apply biodegradation during transport?		No	GW

Optional Sections

User-defined Chemicals

Note: user-defined chemicals should be named in this section before being selected in the 'Contaminant Concentrations' table above

		Chemical 1		Chemical 2		Chemical 3	
Name		Acetaldehyde	*Health Canada values*	Butadiene, 1,3-	*Health Canada values*	Chloroform	*Health Canada values*
CAS Number			75-07-0		106-99-0		*67-66-3*
Chemical class (organic/inorganic)			organic		organic		organic
Tolerable daily intake (mg/kg/d) - infant	*Enter all applicable and appropriate toxicity benchmarks; values must be referenced and justified in the PQRA report.*						
Tolerable daily intake (mg/kg/d) - toddler							
Tolerable daily intake (mg/kg/d) - child							
Tolerable daily intake (mg/kg/d) - teen							
Tolerable daily intake (mg/kg/d) - adult							
Tolerable concentration (mg/m^3)		0.009		0.002		0.04475	
Oral slope factor $(mg/kg/d)^{-1}$							
Inhalation slope factor $(mg/kg/d)^{-1}$							
Inhalation unit risk $(mg/m^3)^{-1}$		2.20E-03		3.00E-02		0.023	
Relative dermal absorption factor							0.03
Organic carbon partitioning coefficient (mL/g) - Koc			1.06		128.8249552		42.65795188
Log Kow (unitless)			0.45		1.99		1.97
Henry's Law constant at 25°C (unitless) - H'			0.002989155		3.008518352		0.153854773
Henry's Law constant at 25°C (atm-m3/mol) - H			7.3131E-05		0.073604737		0.003764125
Water Solubility at 25°C (mg/L)			1000000		735		8200
Molecular Weight (g/mol)			44.052		54.091		119.378
Diffusivity in air (cm2/s)			0.124		0.249		0.104
Diffusivity in water (cm2/s)			0.0000141		0.0000108		0.00001
Vapour Pressure at 25°C (atm)			1.197137923		2.773254379		0.258573896
Normal Boiling Point (K) - optional			293.25		268.74		334.32
Critical Temperature (K) - optional			466		425		536.4
Enthalpy of Vaporization @ Boiling Point (cal/mol) - optional			6156.64		5370.33		7495.219885
Biodegradation Adjustment Factor (unitless)			1		10		1
Half-Life - unsaturated zone (days)							
Half-Life - saturated zone (days)							

Note: values in grayed cells will not be used; Health Canada default values are applied.

User-defined Receptor

Name		Defaults
Age group		Toddler
Body weight (kg)		16.5
Soil ingestion rate (g/d)		0.08
Inhalation rate (m^3/d)		9.3
Water ingestion rate (L/d)		0.6
Skin surface area (cm^2)		
- hands		430
- arms		890
- legs		1690
- total		6130
Soil loading to exposed skin (g/cm^2/event)		
- hands		0.0001
- surfaces other than hands		0.00001
Food ingestion (g/d)		
- root vegetables		105
- other vegetables		67
- fish		56
- wild game		0
Evaluate Cancer Risks (Yes/No)?		No

User-defined Land-Use / Exposure Scenario

Scenario name	User-Defined	Defaults
Hours per day (indoors)		22.5
Hours per day (outdoors)		1.5
Days per week		7
Weeks per year		52
Dermal exposure events/day		1
Water contact events per day		1
Duration of water contact event (h)		1
Days/year contaminated food ingestion		365
Exposure duration (years)		60
Years for carcinogen amortization		60

SUMMARY OF DQRA RESULTS Version: May 1, 2009

User Name: **Site:**
Proponent: **File #:**
Date: **Comment:**

		Maximum Hazard/Risk Estimates					
		Acetaldehyde	**Butadiene, 1,3-**	**Chloroform**	**Ethylbenzene**		
Hazard Quotient - Oral/Dermal		NA	NA	NA	NA	NA	NA
Hazard Quotient - Inhalation		2.02E-02	1.44E-01	3.14E-02	8.06E-02	NA	NA
Hazard Index - Total		2.02E-02	1.44E-01	3.14E-02	8.06E-02	NA	NA
Target Hazard Index:	0.2						
Cancer Risk - Oral		NA	NA	NA	NA	NA	NA
Cancer Risk - Dermal		NA	NA	NA	NA	NA	NA
Cancer Risk - Oral + Dermal		NA	NA	NA	NA	NA	NA
Cancer Risk - Inhalation		4.00E-07	8.63E-06	3.23E-05	NA	NA	NA
Cancer Risk - Total		4.00E-07	8.63E-06	3.23E-05	NA	NA	NA
Target Cancer Risk:	1.00E-05			**Target Cancer Risk Exceeded**			

		Critical Receptors					
		Acetaldehyde	**Butadiene, 1,3-**	**Chloroform**	**Ethylbenzene**		
Oral/Dermal - non-cancer effects		NA	NA	NA	NA	NA	NA
Inhalation - non-cancer effects		All Age Groups	All Age Groups	All Age Groups	All Age Groups	NA	NA
Total - non-cancer effects		All Age Groups	All Age Groups	All Age Groups	All Age Groups	NA	NA
Oral - cancer effects		NA	NA	NA	NA	NA	NA
Dermal - cancer effects		NA	NA	NA	NA	NA	NA
Oral + Dermal - cancer effects		NA	NA	NA	NA	NA	NA
Inhalation - cancer effects		Adult	Adult	Adult	NA	NA	NA
Total - cancer effects		Adult	Adult	Adult	NA	NA	NA
Source of indoor air vapours		Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours
Model used for vapour transport		Fixed alpha	Fixed alpha	Fixed alpha	Fixed alpha	NA	NA

Key Calculated Model Parameters							
Vapour Intrusion Model Parameters	Note: parameters show as "NA" if relevant exposure pathways are inoperative or if user-input concentration is used instead of modelled value						
Qsoil/Qbuilding		2.22E-03	2.22E-03	2.22E-03	1.55E-03	NA	NA
Soil alpha		2.83E-03	2.83E-03	2.83E-03	2.83E-03	NA	NA
Groundwater alpha		1.06E-03	1.06E-03	1.06E-03	1.06E-03	NA	NA
Soil vapour alpha		2.83E-03	2.83E-03	2.83E-03	2.83E-03	NA	NA
Groundwater model dilution factors							
DF1 (soil to leachate)		NA	NA	NA	NA	NA	NA
DF2 (leachate at source to water table):		NA	NA	NA	NA	NA	NA
DF3 (leachate at water table to groundwater):		NA	NA	NA	NA	NA	NA
DF4 (source to receptor) - drinking water:		NA	NA	NA	NA	NA	NA
DF4 (source to receptor) - bathing/swimming water:		NA	NA	NA	NA	NA	NA

Notes/Comments

Vapour Intrusion Model

Chemical Interactions
All chemicals of concern present at the site should be evaluated for potential additive effects based on target organs and mechanisms of effect.

Concentration Checks

Precluding Conditions

Other Notes

HEALTH CANADA DQRA SPREADSHEET
USER INPUT SHEET

User Name:		Site:	
Proponent:		File #:	
Date:		Comment:	

PROBLEM FORMULATION

Potential Land Uses (Yes/No)

		Default
Agricultural	No	Yes
Residential/urban parkland	Yes	Yes
Commercial	No	Yes
Industrial	No	Yes
Occupational - Outdoors	No	Yes
Recreational	No	Yes
Other		No
specify:		

Exposure Scenario

	Residential	Residential

Receptor Groups (Yes/No)

		Default
General public or residents		Yes
Employees	No	Yes
Canadian native communities		No
Other		No
specify:		

Operative Pathways (Yes/No)

		Default
Inadvertent ingestion of soil	No	Yes
Inhalation of soil particles	No	Yes
Inhalation of indoor contaminant vapours	Yes	Yes
Inhalation of outdoor contaminant vapours	No	Yes
Ingestion of drinking water	No	Yes
Dermal contact with soil	No	Yes
Dermal contact with water	No	Yes
Ingestion of contaminated food		No

Vapour Transport Modelling

Vapour source for exposure calculations	Subslab (shallow) Vapou	Most Conservative
Model applied for soil to indoor air		Health Canada
Model applied for groundwater to indoor air		Health Canada
Model applied for soil vapour to indoor air		Health Canada

Active Critical Receptors (Yes/No)

		Default
Infant	No	Yes
Toddler	Yes	Yes
Child	No	Yes
Teen	No	Yes
Adult	Yes	Yes
Other		No
specify:		

Contaminant Concentrations

Chemical Name	required	Hexachloro-1,3-butadiene	Methanol	Trimethylbenzene, 1,2,4-	Xylenes (total)		
Soil (mg/kg)	required						
Mole Fraction in Soil (unitless)	optional						
Groundwater - source (mg/L)	optional						
Mole Fraction in Groundwater (unitless)	optional						
Drinking water (mg/L)	optional						
Bathing/swimming water (mg/L)	optional						
Indoor air - vapours (mg/m^3)	optional						
Outdoor air - vapours (mg/m^3)	optional						
Outdoor air - particulate (mg/m^3)	optional						
Soil vapours (> 1 m below foundation) (mg/m3)	optional						
Subslab/shallow soil vapour (<1 m) (mg/m3)	optional	0.0005	4.43	10.7	33		
Root vegetables (mg/kg wet weight)	optional						
Other vegetables (mg/kg wet weight)	optional						
Fish (mg/kg wet weight)	optional						
Wild game (mg/kg wet weight)	optional						

Risk Assessment Endpoints

		Default
Acceptable hazard index:		0.2
Acceptable cancer risk:		1.00E-05

Precluding Conditions for Fate and Transport Models

Are non-aqueous phase liquids (NAPL) present?	No
Is groundwater contamination present in fractured bedrock?	No
Is groundwater contamination migrating through a confined aquifer?	No
Is there active pumping or drawdown of groundwater at the site?	No
Is contamination present within 1 m of building foundation?	No
Do any buildings within 5 m of contamination have earthen foundations?	No
Are any buildings constructed on very high permeability media?	No
Are there preferential vapour flow pathways connecting contamination to a building?	No

Fate and Transport Model Input

	Value	Default	Models Affected
Soil Type		coarse-grained	PS, V-H, V-C, V-O, GW
Significant vehicle traffic on unpaved roads?		No	P-O
Site Characteristics			
Source Length (m)		10	GW, V-O
Source Width (m)		10	GW, V-O
Depth to Groundwater (m)		3	GW, V-O
Depth from Surface to Contamination (m)		0	GW, V-O
Thickness of Contamination (m)		3	GW
Distance - Contaminated Soil to Building (m)		1	V-H, V-C
Distance - Contaminated GW to Building (m)		1	V-H, V-C
Depth Below Building to Vapour Sample (m)		1	V-H, V-C
Distance to potable water user (m)		0	GW
Distance to Bathing/Swimming Water (m)		0	GW
Particulate Concentration in Air (ug/m^3)		0.76	P-O
Hydrological Parameters			
Recharge (m/y)		0.28	GW
Soil/Groundwater Characteristics	coarse-grained		
Vadose Zone			
Dry Bulk Density (g/cm3)		1.700	PS, V-C
Water Content (g/g dry wt)		0.070	PS, V-C
Capillary Zone			
Thickness of Capillary Zone (cm)		5	V-C
Water Content (g/g dry wt)		0.070	V-C
Aquifer/Contaminated Zone			
Saturated Hydraulic Conductivity (m/y)		320	GW
Hydraulic Gradient (m/m)		0.028	GW
Organic Carbon Fraction (g/g)		0.005	PS, GW
Soil Temperature (^{o}C)		21	PS, PGW
Depth of unconfined aquifer (m)		5	GW
Vapour Transport Properties			
Soil Vapour Permeability (cm^2) - CCME model		6.00E-08	V-C
Building Type		Residential - Slab on Grade	V-H, V-C
Building Characteristics	Residential - Slab on Grade		
Building length (m)		12.25	V-C
Building width (m)		12.25	V-C
Building mixing height (m)		3.6	V-H, V-C
Thickness of building foundation (cm)		11.25	V-C
Depth to base of foundation (m)		0.1125	V-C
Air exchanges per hour		0.5	V-C
Pressure differential (Pa)		40	V-C
Crack Area (cm^2)		994.5	V-C
Additional Vapour Intrusion Parameters (Health Canada model)			
Apply biodegradation adjustment?		No	V-H
Apply groundwater mass flux check?		No	V-H
Apply source depletion check?		No	V-H
Additional Groundwater Model Parameters			
Apply biodegradation during transport?		No	GW

Optional Sections

User-defined Chemicals

Note: user-defined chemicals should be named in this section before being selected in the 'Contaminant Concentrations' table above

Enter all applicable and appropriate toxicity benchmarks; values must be referenced and justified in the PQRA report.

	Chemical 1		Chemical 2	Chemical 3	
Name	Hexachloro-1,3-butadiene	*Health Canada values*	Methanol	Trimethylbenzene, 1,2,4-	*Health Canada values*
CAS Number		87-68-3	67-56-1		*95-63-6*
Chemical class (organic/inorganic)		organic	organic		organic
Tolerable daily intake (mg/kg/d) - infant					
Tolerable daily intake (mg/kg/d) - toddler					
Tolerable daily intake (mg/kg/d) - child					
Tolerable daily intake (mg/kg/d) - teen					
Tolerable daily intake (mg/kg/d) - adult					
Tolerable concentration (mg/m^3)			2.2	0.007	0.007
Oral slope factor $(mg/kg/d)^{-1}$					
Inhalation slope factor $(mg/kg/d)^{-1}$					
Inhalation unit risk $(mg/m^3)^{-1}$		0.022			
Relative dermal absorption factor					
Organic carbon partitioning coefficient (mL/g) - Koc		53700	1		1905.460718
Log Kow (unitless)		4.7	-7.70E-01		3.6
Henry's Law constant at 25°C (unitless) - H'		0.657533509	1.86E-04		0.229531636
Henry's Law constant at 25°C (atm-m3/mol) - H		0.016086849	4.55E-06		0.005615593
Water Solubility at 25°C (mg/L)		3.2	1.00E+06		57
Molecular Weight (g/mol)		260.761	32		120.191
Diffusivity in air (cm2/s)		0.0561	1.58E-01		0.0606
Diffusivity in water (cm2/s)		0.00000616	1.65E-05		0.00000792
Vapour Pressure at 25°C (atm)		0.000197385	0.17		0.002664693
Normal Boiling Point (K) - optional		488.15			442.53
Critical Temperature (K) - optional		738			649.17
Enthalpy of Vaporization @ Boiling Point (cal/mol) - optional		10206			9368.8
Biodegradation Adjustment Factor (unitless)		1	1		10
Half-Life - unsaturated zone (days)					
Half-Life - saturated zone (days)					

Note: values in grayed cells will not be used; Health Canada default values are applied.

User-defined Receptor

Name		Defaults
Age group		Toddler
Body weight (kg)		16.5
Soil ingestion rate (g/d)		0.08
Inhalation rate (m^3/d)		9.3
Water ingestion rate (L/d)		0.6
Skin surface area (cm^2)		
- hands		430
- arms		890
- legs		1690
- total		6130
Soil loading to exposed skin (g/cm^2/event)		
- hands		0.0001
- surfaces other than hands		0.00001
Food ingestion (g/d)		
- root vegetables		105
- other vegetables		67
- fish		56
- wild game		0
Evaluate Cancer Risks (Yes/No)?		No

User-defined Land-Use / Exposure Scenario

Scenario name	User-Defined	Defaults
Hours per day (indoors)		22.5
Hours per day (outdoors)		1.5
Days per week		7
Weeks per year		52
Dermal exposure events/day		1
Water contact events per day		1
Duration of water contact event (h)		1
Days/year contaminated food ingestion		365
Exposure duration (years)		60
Years for carcinogen amortization		60

SUMMARY OF DQRA RESULTS Version: May 1, 2009

User Name: **Site:**
Proponent: **File #:**
Date: **Comment:**

		Maximum Hazard/Risk Estimates					
		Hexachloro-1,3-butadiene	**Methanol**	**Trimethylbenzene, 1,2,4-**	**Xylenes (total)**		
Hazard Quotient - Oral/Dermal		NA	NA	NA	NA	NA	NA
Hazard Quotient - Inhalation		NA	1.89E-02	1.43E+01	1.72E+00	NA	NA
Hazard Index - Total		NA	1.89E-02	1.43E+01	1.72E+00	NA	NA
Target Hazard Index:	0.2			**Target Hazard Index Exceeded**	**Target Hazard Index Exceeded**		
Cancer Risk - Oral		NA	NA	NA	NA	NA	NA
Cancer Risk - Dermal		NA	NA	NA	NA	NA	NA
Cancer Risk - Oral + Dermal		NA	NA	NA	NA	NA	NA
Cancer Risk - Inhalation		1.03E-07	NA	NA	NA	NA	NA
Cancer Risk - Total		1.03E-07	NA	NA	NA	NA	NA
Target Cancer Risk:	1.00E-05						

	Critical Receptors					
	Hexachloro-1,3-butadiene	**Methanol**	**Trimethylbenzene, 1,2,4-**	**Xylenes (total)**		
Oral/Dermal - non-cancer effects	NA	NA	NA	NA	NA	NA
Inhalation - non-cancer effects	NA	All Age Groups	All Age Groups	All Age Groups	NA	NA
Total - non-cancer effects	NA	All Age Groups	All Age Groups	All Age Groups	NA	NA
Oral - cancer effects	NA	NA	NA	NA	NA	NA
Dermal - cancer effects	NA	NA	NA	NA	NA	NA
Oral + Dermal - cancer effects	NA	NA	NA	NA	NA	NA
Inhalation - cancer effects	Adult	NA	NA	NA	NA	NA
Total - cancer effects	Adult	NA	NA	NA	NA	NA
Source of indoor air vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours
Model used for vapour transport	Fixed alpha	Fixed alpha	Fixed alpha	Fixed alpha	NA	NA

Key Calculated Model Parameters						
Vapour Intrusion Model Parameters	Note: parameters show as "NA" if relevant exposure pathways are inoperative or if user-input concentration is used instead of modelled value					
Qsoil/Qbuilding	2.22E-03	2.22E-03	2.22E-03	1.55E-03	NA	NA
Soil alpha	2.83E-03	2.83E-03	2.83E-03	2.83E-03	NA	NA
Groundwater alpha	1.06E-03	1.06E-03	1.06E-03	1.06E-03	NA	NA
Soil vapour alpha	2.83E-03	2.83E-03	2.83E-03	2.83E-03	NA	NA
Groundwater model dilution factors						
DF1 (soil to leachate)	NA	NA	NA	NA	NA	NA
DF2 (leachate at source to water table):	NA	NA	NA	NA	NA	NA
DF3 (leachate at water table to groundwater):	NA	NA	NA	NA	NA	NA
DF4 (source to receptor) - drinking water:	NA	NA	NA	NA	NA	NA
DF4 (source to receptor) - bathing/swimming water:	NA	NA	NA	NA	NA	NA

Notes/Comments

Vapour Intrusion Model

Chemical Interactions
All chemicals of concern present at the site should be evaluated for potential additive effects based on target organs and mechanisms of effect.

Concentration Checks

Precluding Conditions

Other Notes

HEALTH CANADA DQRA SPREADSHEET
USER INPUT SHEET

User Name:		Site:	
Proponent:		File #:	
Date:		Comment:	

PROBLEM FORMULATION

Potential Land Uses (Yes/No)		Default
Agricultural	No	Yes
Residential/urban parkland	Yes	Yes
Commercial	No	Yes
Industrial	No	Yes
Occupational - Outdoors	No	Yes
Recreational	No	Yes
Other		No
specify:		

Exposure Scenario		
	Residential	Residential

Receptor Groups (Yes/No)		Default
General public or residents		Yes
Employees		Yes
Canadian native communities		No
Other		No
specify:		

Operative Pathways (Yes/No)		Default
Inadvertent ingestion of soil	No	Yes
Inhalation of soil particles	No	Yes
Inhalation of indoor contaminant vapours	Yes	Yes
Inhalation of outdoor contaminant vapours	No	Yes
Ingestion of drinking water	No	Yes
Dermal contact with soil	No	Yes
Dermal contact with water	No	Yes
Ingestion of contaminated food		No

Vapour Transport Modelling		
Vapour source for exposure calculations	Subslab (shallow) Vapou	Most Conservative
Model applied for soil to indoor air		Health Canada
Model applied for groundwater to indoor air		Health Canada
Model applied for soil vapour to indoor air		Health Canada

Active Critical Receptors (Yes/No)		Default
Infant	No	Yes
Toddler	Yes	Yes
Child	No	Yes
Teen	No	Yes
Adult	Yes	Yes
Other		No
specify:		

Contaminant Concentrations

Chemical Name	required	Tetrachloroethane, 1,1,1,2-	Xylene, o-	Xylene, p-			
Soil (mg/kg)	required						
Mole Fraction in Soil (unitless)	optional						
Groundwater - source (mg/L)	optional						
Mole Fraction in Groundwater (unitless)	optional						
Drinking water (mg/L)	optional						
Bathing/swimming water (mg/L)	optional						
Indoor air - vapours (mg/m^3)	optional						
Outdoor air - vapours (mg/m^3)	optional						
Outdoor air - particulate (mg/m^3)	optional						
Soil vapours (> 1 m below foundation) (mg/m3)	optional						
Subslab/shallow soil vapour (<1 m) (mg/m3)	optional	0.0046	8.26	20.7			
Root vegetables (mg/kg wet weight)	optional						
Other vegetables (mg/kg wet weight)	optional						
Fish (mg/kg wet weight)	optional						
Wild game (mg/kg wet weight)	optional						

Risk Assessment Endpoints		Default
Acceptable hazard index:		0.2
Acceptable cancer risk:		1.00E-05

Precluding Conditions for Fate and Transport Models

Are non-aqueous phase liquids (NAPL) present?	No
Is groundwater contamination present in fractured bedrock?	No
Is groundwater contamination migrating through a confined aquifer?	No
Is there active pumping or drawdown of groundwater at the site?	No
Is contamination present within 1 m of building foundation?	No
Do any buildings within 5 m of contamination have earthen foundations?	No
Are any buildings constructed on very high permeability media?	No
Are there preferential vapour flow pathways connecting contamination to a building?	No

Fate and Transport Model Input

	Value	Default	Models Affected
Soil Type		coarse-grained	PS, V-H, V-C, V-O, GW
Significant vehicle traffic on unpaved roads?		No	P-O
Site Characteristics			
Source Length (m)		10	GW, V-O
Source Width (m)		10	GW, V-O
Depth to Groundwater (m)		3	GW, V-O
Depth from Surface to Contamination (m)		0	GW, V-O
Thickness of Contamination (m)		3	GW
Distance - Contaminated Soil to Building (m)		1	V-H, V-C
Distance - Contaminated GW to Building (m)		1	V-H, V-C
Depth Below Building to Vapour Sample (m)		1	V-H, V-C
Distance to potable water user (m)		0	GW
Distance to Bathing/Swimming Water (m)		0	GW
Particulate Concentration in Air (ug/m^3)		0.76	P-O
Hydrological Parameters			
Recharge (m/y)		0.28	GW
Soil/Groundwater Characteristics	coarse-grained		
Vadose Zone			
Dry Bulk Density (g/cm3)		1.700	PS, V-C
Water Content (g/g dry wt)		0.070	PS, V-C
Capillary Zone			
Thickness of Capillary Zone (cm)		5	V-C
Water Content (g/g dry wt)		0.070	V-C
Aquifer/Contaminated Zone			
Saturated Hydraulic Conductivity (m/y)		320	GW
Hydraulic Gradient (m/m)		0.028	GW
Organic Carbon Fraction (g/g)		0.005	PS, GW
Soil Temperature (^{o}C)		21	PS, PGW
Depth of unconfined aquifer (m)		5	GW
Vapour Transport Properties			
Soil Vapour Permeability (cm^2) - CCME model		6.00E-08	V-C
Building Type		Residential - Slab on Grade	V-H, V-C
Building Characteristics	Residential - Slab on Grade		
Building length (m)		12.25	V-C
Building width (m)		12.25	V-C
Building mixing height (m)		3.6	V-H, V-C
Thickness of building foundation (cm)		11.25	V-C
Depth to base of foundation (m)		0.1125	V-C
Air exchanges per hour		0.5	V-C
Pressure differential (Pa)		40	V-C
Crack Area (cm^2)		994.5	V-C
Additional Vapour Intrusion Parameters (Health Canada model)			
Apply biodegradation adjustment?		No	V-H
Apply groundwater mass flux check?		No	V-H
Apply source depletion check?		No	V-H
Additional Groundwater Model Parameters			
Apply biodegradation during transport?		No	GW

Optional Sections

User-defined Chemicals

Note: user-defined chemicals should be named in this section before being selected in the 'Contaminant Concentrations' table above

		Chemical 1		Chemical 2		Chemical 3	
Name		Tetrachloroethane, 1,1,1,2-	*Health Canada values*	Xylene, o-	*Health Canada values*	Xylene, p-	*Health Canada values*
CAS Number			630-20-6		95-47-6		*106-42-3*
Chemical class (organic/inorganic)			organic		organic		organic
Tolerable daily intake (mg/kg/d) - infant	*Enter all applicable and appropriate toxicity benchmarks; values must be referenced and justified in the PQRA report.*						
Tolerable daily intake (mg/kg/d) - toddler							
Tolerable daily intake (mg/kg/d) - child							
Tolerable daily intake (mg/kg/d) - teen							
Tolerable daily intake (mg/kg/d) - adult							
Tolerable concentration (mg/m^3)				0.1		0.1	
Oral slope factor $(mg/kg/d)^{-1}$							
Inhalation slope factor $(mg/kg/d)^{-1}$							
Inhalation unit risk $(mg/m^3)^{-1}$		7.40E-03					
Relative dermal absorption factor					0.03		0.03
Organic carbon partitioning coefficient (mL/g) - Koc			116		316.227766		234.4228815
Log Kow (unitless)			3.03		3.15		3.18
Henry's Law constant at 25°C (unitless) - H'			0.099961229		0.227918057		0.233162189
Henry's Law constant at 25°C (atm-m3/mol) - H			0.002445596		0.005576116		0.005704416
Water Solubility at 25°C (mg/L)			1070		220		215
Molecular Weight (g/mol)			167.849		106.165		106.165
Diffusivity in air (cm2/s)			0.071		0.087		0.0769
Diffusivity in water (cm2/s)			0.0000079		0.00001		0.00000844
Vapour Pressure at 25°C (atm)			0.015593388		0.011547002		0.011547002
Normal Boiling Point (K) - optional			403.35		417.65		411.52
Critical Temperature (K) - optional			624		630.3		616.2
Enthalpy of Vaporization @ Boiling Point (cal/mol) - optional			9196.940727		9591.300191		9364.244742
Biodegradation Adjustment Factor (unitless)			1		10		10
Half-Life - unsaturated zone (days)					182.5		182.5
Half-Life - saturated zone (days)					182.5		182.5

Note: values in grayed cells will not be used; Health Canada default values are applied.

User-defined Receptor

Name		Defaults
Age group		Toddler
Body weight (kg)		16.5
Soil ingestion rate (g/d)		0.08
Inhalation rate (m^3/d)		9.3
Water ingestion rate (L/d)		0.6
Skin surface area (cm^2)		
- hands		430
- arms		890
- legs		1690
- total		6130
Soil loading to exposed skin (g/cm^2/event)		
- hands		0.0001
- surfaces other than hands		0.00001
Food ingestion (g/d)		
- root vegetables		105
- other vegetables		67
- fish		56
- wild game		0
Evaluate Cancer Risks (Yes/No)?		No

User-defined Land-Use / Exposure Scenario

Scenario name	User-Defined	Defaults
Hours per day (indoors)		22.5
Hours per day (outdoors)		1.5
Days per week		7
Weeks per year		52
Dermal exposure events/day		1
Water contact events per day		1
Duration of water contact event (h)		1
Days/year contaminated food ingestion		365
Exposure duration (years)		60
Years for carcinogen amortization		60

SUMMARY OF DQRA RESULTS Version: May 1, 2009

User Name: **Site:**
Proponent: **File #:**
Date: **Comment:**

		Maximum Hazard/Risk Estimates					
		Tetrachloroethane, 1,1,1,2-	**Xylene, o-**	**Xylene, p-**			
Hazard Quotient - Oral/Dermal		NA	NA	NA	NA	NA	NA
Hazard Quotient - Inhalation		NA	7.74E-01	1.94E+00	NA	NA	NA
Hazard Index - Total		NA	7.74E-01	1.94E+00	NA	NA	NA
Target Hazard Index:	0.2		**Target Hazard Index Exceeded**	**Target Hazard Index Exceeded**			
Cancer Risk - Oral		NA	NA	NA	NA	NA	NA
Cancer Risk - Dermal		NA	NA	NA	NA	NA	NA
Cancer Risk - Oral + Dermal		NA	NA	NA	NA	NA	NA
Cancer Risk - Inhalation		3.19E-07	NA	NA	NA	NA	NA
Cancer Risk - Total		3.19E-07	NA	NA	NA	NA	NA
Target Cancer Risk:	1.00E-05						

	Critical Receptors					
	Tetrachloroethane, 1,1,1,2-	**Xylene, o-**	**Xylene, p-**			
Oral/Dermal - non-cancer effects	NA	NA	NA	NA	NA	NA
Inhalation - non-cancer effects	NA	All Age Groups	All Age Groups	NA	NA	NA
Total - non-cancer effects	NA	All Age Groups	All Age Groups	NA	NA	NA
Oral - cancer effects	NA	NA	NA	NA	NA	NA
Dermal - cancer effects	NA	NA	NA	NA	NA	NA
Oral + Dermal - cancer effects	NA	NA	NA	NA	NA	NA
Inhalation - cancer effects	Adult	NA	NA	NA	NA	NA
Total - cancer effects	Adult	NA	NA	NA	NA	NA
Source of indoor air vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours
Model used for vapour transport	Fixed alpha	Fixed alpha	Fixed alpha	NA	NA	NA

Key Calculated Model Parameters						
Vapour Intrusion Model Parameters	Note: parameters show as "NA" if relevant exposure pathways are inoperative or if user-input concentration is used instead of modelled value					
Qsoil/Qbuilding	2.22E-03	2.22E-03	2.22E-03	NA	NA	NA
Soil alpha	2.83E-03	2.83E-03	2.83E-03	NA	NA	NA
Groundwater alpha	1.06E-03	1.06E-03	1.06E-03	NA	NA	NA
Soil vapour alpha	2.83E-03	2.83E-03	2.83E-03	NA	NA	NA
Groundwater model dilution factors						
DF1 (soil to leachate)	NA	NA	NA	NA	NA	NA
DF2 (leachate at source to water table):	NA	NA	NA	NA	NA	NA
DF3 (leachate at water table to groundwater):	NA	NA	NA	NA	NA	NA
DF4 (source to receptor) - drinking water:	NA	NA	NA	NA	NA	NA
DF4 (source to receptor) - bathing/swimming water:	NA	NA	NA	NA	NA	NA

Notes/Comments

Vapour Intrusion Model

Chemical Interactions
All chemicals of concern present at the site should be evaluated for potential additive effects based on target organs and mechanisms of effect.

Concentration Checks

Precluding Conditions

Other Notes

HEALTH CANADA DQRA SPREADSHEET
USER INPUT SHEET

User Name:		Site:	
Proponent:		File #:	
Date:		Comment:	

PROBLEM FORMULATION

Potential Land Uses (Yes/No)		Default
Agricultural	No	Yes
Residential/urban parkland	Yes	Yes
Commercial	No	Yes
Industrial	No	Yes
Occupational - Outdoors	No	Yes
Recreational	No	Yes
Other		No
specify:		

Exposure Scenario		
	Residential	Residential

Receptor Groups (Yes/No)		Default
General public or residents		Yes
Employees		Yes
Canadian native communities		No
Other		No
specify:		

Operative Pathways (Yes/No)		Default
Inadvertent ingestion of soil	No	Yes
Inhalation of soil particles	No	Yes
Inhalation of indoor contaminant vapours	Yes	Yes
Inhalation of outdoor contaminant vapours	No	Yes
Ingestion of drinking water	No	Yes
Dermal contact with soil	No	Yes
Dermal contact with water	No	Yes
Ingestion of contaminated food		No

Vapour Transport Modelling		
Vapour source for exposure calculations	Subslab (shallow) Vapou	Most Conservative
Model applied for soil to indoor air		Health Canada
Model applied for groundwater to indoor air		Health Canada
Model applied for soil vapour to indoor air		Health Canada

Active Critical Receptors (Yes/No)		Default
Infant	No	Yes
Toddler	Yes	Yes
Child	No	Yes
Teen	No	Yes
Adult	Yes	Yes
Other		No
specify:		

Contaminant Concentrations

Chemical Name	required	F1	Nonane	Trimethylbenzene, 1, 2, 3-			
Soil (mg/kg)	required						
Mole Fraction in Soil (unitless)	optional						
Groundwater - source (mg/L)	optional						
Mole Fraction in Groundwater (unitless)	optional						
Drinking water (mg/L)	optional						
Bathing/swimming water (mg/L)	optional						
Indoor air - vapours (mg/m^3)	optional						
Outdoor air - vapours (mg/m^3)	optional						
Outdoor air - particulate (mg/m^3)	optional						
Soil vapours (> 1 m below foundation) (mg/m3)	optional						
Subslab/shallow soil vapour (<1 m) (mg/m3)	optional	180	4.5	2.14			
Root vegetables (mg/kg wet weight)	optional						
Other vegetables (mg/kg wet weight)	optional						
Fish (mg/kg wet weight)	optional						
Wild game (mg/kg wet weight)	optional						

See also PHC Sheet

Risk Assessment Endpoints		Default
Acceptable hazard index:		0.2
Acceptable cancer risk:		1.00E-05

Precluding Conditions for Fate and Transport Models

Are non-aqueous phase liquids (NAPL) present?	No
Is groundwater contamination present in fractured bedrock?	No
Is groundwater contamination migrating through a confined aquifer?	No
Is there active pumping or drawdown of groundwater at the site?	No
Is contamination present within 1 m of building foundation?	No
Do any buildings within 5 m of contamination have earthen foundations?	No
Are any buildings constructed on very high permeability media?	No
Are there preferential vapour flow pathways connecting contamination to a building?	No

Fate and Transport Model Input

	Value	Default	Models Affected
Soil Type		coarse-grained	PS, V-H, V-C, V-O, GW
Significant vehicle traffic on unpaved roads?		No	P-O
Site Characteristics			
Source Length (m)		10	GW, V-O
Source Width (m)		10	GW, V-O
Depth to Groundwater (m)		3	GW, V-O
Depth from Surface to Contamination (m)		0	GW, V-O
Thickness of Contamination (m)		3	GW
Distance - Contaminated Soil to Building (m)		1	V-H, V-C
Distance - Contaminated GW to Building (m)		1	V-H, V-C
Depth Below Building to Vapour Sample (m)		1	V-H, V-C
Distance to potable water user (m)		0	GW
Distance to Bathing/Swimming Water (m)		0	GW
Particulate Concentration in Air (ug/m^3)		0.76	P-O
Hydrological Parameters			
Recharge (m/y)		0.28	GW
Soil/Groundwater Characteristics	coarse-grained		
Vadose Zone			
Dry Bulk Density (g/cm3)		1.700	PS, V-C
Water Content (g/g dry wt)		0.070	PS, V-C
Capillary Zone			
Thickness of Capillary Zone (cm)		5	V-C
Water Content (g/g dry wt)		0.070	V-C
Aquifer/Contaminated Zone			
Saturated Hydraulic Conductivity (m/y)		320	GW
Hydraulic Gradient (m/m)		0.028	GW
Organic Carbon Fraction (g/g)		0.005	PS, GW
Soil Temperature (^{o}C)		21	PS, PGW
Depth of unconfined aquifer (m)		5	GW
Vapour Transport Properties			
Soil Vapour Permeability (cm^2) - CCME model		6.00E-08	V-C
Building Type		Residential - Slab on Grade	V-H, V-C
Building Characteristics	Residential - Slab on Grade		
Building length (m)		12.25	V-C
Building width (m)		12.25	V-C
Building mixing height (m)		3.6	V-H, V-C
Thickness of building foundation (cm)		11.25	V-C
Depth to base of foundation (m)		0.1125	V-C
Air exchanges per hour		0.5	V-C
Pressure differential (Pa)		40	V-C
Crack Area (cm^2)		994.5	V-C
Additional Vapour Intrusion Parameters (Health Canada model)			
Apply biodegradation adjustment?		No	V-H
Apply groundwater mass flux check?		No	V-H
Apply source depletion check?		No	V-H
Additional Groundwater Model Parameters			
Apply biodegradation during transport?		No	GW

Optional Sections

User-defined Chemicals

Note: user-defined chemicals should be named in this section before being selected in the 'Contaminant Concentrations' table above

		Chemical 1	Chemical 2	Chemical 3
Name		Nonane	Trimethylbenzene, 1, 2, 3-	
CAS Number		111-84-2		
Chemical class (organic/inorganic)		organic		
Tolerable daily intake (mg/kg/d) - infant	*Enter all applicable and appropriate toxicity benchmarks; values must be referenced and justified in the PQRA report.*			
Tolerable daily intake (mg/kg/d) - toddler				
Tolerable daily intake (mg/kg/d) - child				
Tolerable daily intake (mg/kg/d) - teen				
Tolerable daily intake (mg/kg/d) - adult				
Tolerable concentration (mg/m^3)		0.2	0.005	
Oral slope factor $(mg/kg/d)^{-1}$				
Inhalation slope factor $(mg/kg/d)^{-1}$				
Inhalation unit risk $(mg/m^3)^{-1}$				
Relative dermal absorption factor				
Organic carbon partitioning coefficient (mL/g) - Koc				
Log Kow (unitless)				
Henry's Law constant at 25°C (unitless) - H'				
Henry's Law constant at 25°C (atm-m3/mol) - H				
Water Solubility at 25°C (mg/L)				
Molecular Weight (g/mol)				
Diffusivity in air (cm2/s)				
Diffusivity in water (cm2/s)				
Vapour Pressure at 25°C (atm)				
Normal Boiling Point (K) - optional				
Critical Temperature (K) - optional				
Enthalpy of Vaporization @ Boiling Point (cal/mol) - optional				
Biodegradation Adjustment Factor (unitless)				
Half-Life - unsaturated zone (days)				
Half-Life - saturated zone (days)				

Note: values in grayed cells will not be used; Health Canada default values are applied.

User-defined Receptor

Name		Defaults
Age group		Toddler
Body weight (kg)		16.5
Soil ingestion rate (g/d)		0.08
Inhalation rate (m^3/d)		9.3
Water ingestion rate (L/d)		0.6
Skin surface area (cm^2)		
- hands		430
- arms		890
- legs		1690
- total		6130
Soil loading to exposed skin (g/cm^2/event)		
- hands		0.0001
- surfaces other than hands		0.00001
Food ingestion (g/d)		
- root vegetables		105
- other vegetables		67
- fish		56
- wild game		0
Evaluate Cancer Risks (Yes/No)?		No

User-defined Land-Use / Exposure Scenario

Scenario name	User-Defined	Defaults
Hours per day (indoors)		22.5
Hours per day (outdoors)		1.5
Days per week		7
Weeks per year		52
Dermal exposure events/day		1
Water contact events per day		1
Duration of water contact event (h)		1
Days/year contaminated food ingestion		365
Exposure duration (years)		60
Years for carcinogen amortization		60

SUMMARY OF DQRA RESULTS Version: May 1, 2009

User Name: **Site:**
Proponent: **File #:**
Date: **Comment:**

		Maximum Hazard/Risk Estimates					
		F1	**Nonane**	**Trimethylbenzene, 1, 2, 3-**			
Hazard Quotient - Oral/Dermal		NA	NA	NA	NA	NA	NA
Hazard Quotient - Inhalation		3.57E-01	2.11E-01	4.01E+00	NA	NA	NA
Hazard Index - Total		3.57E-01	2.11E-01	4.01E+00	NA	NA	NA
Target Hazard Index:	0.2	**Target Hazard Index Exceeded**	**Target Hazard Index Exceeded**	**Target Hazard Index Exceeded**			
Cancer Risk - Oral		NA	NA	NA	NA	NA	NA
Cancer Risk - Dermal		NA	NA	NA	NA	NA	NA
Cancer Risk - Oral + Dermal		NA	NA	NA	NA	NA	NA
Cancer Risk - Inhalation		NA	NA	NA	NA	NA	NA
Cancer Risk - Total		NA	NA	NA	NA	NA	NA
Target Cancer Risk:	1.00E-05						

	Critical Receptors					
	F1	**Nonane**	**Trimethylbenzene, 1, 2, 3-**			
Oral/Dermal - non-cancer effects	NA	NA	NA	NA	NA	NA
Inhalation - non-cancer effects	All Age Groups	All Age Groups	All Age Groups	NA	NA	NA
Total - non-cancer effects	All Age Groups	All Age Groups	All Age Groups	NA	NA	NA
Oral - cancer effects	NA	NA	NA	NA	NA	NA
Dermal - cancer effects	NA	NA	NA	NA	NA	NA
Oral + Dermal - cancer effects	NA	NA	NA	NA	NA	NA
Inhalation - cancer effects	NA	NA	NA	NA	NA	NA
Total - cancer effects	NA	NA	NA	NA	NA	NA
Source of indoor air vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours	Subslab (shallow) Vapours
Model used for vapour transport	Fixed alpha	Fixed alpha	Fixed alpha	NA	NA	NA

Key Calculated Model Parameters						
Vapour Intrusion Model Parameters	Note: parameters show as "NA" if relevant exposure pathways are inoperative or if user-input concentration is used instead of modelled value					
Qsoil/Qbuilding	2.22E-03	2.22E-03	2.22E-03	NA	NA	NA
Soil alpha	2.83E-03	2.83E-03	2.83E-03	NA	NA	NA
Groundwater alpha	1.06E-03	1.06E-03	1.06E-03	NA	NA	NA
Soil vapour alpha	2.83E-03	2.83E-03	2.83E-03	NA	NA	NA
Groundwater model dilution factors						
DF1 (soil to leachate)	NA	NA	NA	NA	NA	NA
DF2 (leachate at source to water table):	NA	NA	NA	NA	NA	NA
DF3 (leachate at water table to groundwater):	NA	NA	NA	NA	NA	NA
DF4 (source to receptor) - drinking water:	NA	NA	NA	NA	NA	NA
DF4 (source to receptor) - bathing/swimming water:	NA	NA	NA	NA	NA	NA

Notes/Comments

Vapour Intrusion Model

Chemical Interactions
All chemicals of concern present at the site should be evaluated for potential additive effects based on target organs and mechanisms of effect.

Concentration Checks

Precluding Conditions

Other Notes

APPENDIX D
Sample Calculations

1.0 INHALATION OF CONTAMINANT VAPOURS DOSE RATE:

$$D_v = \frac{C_A \times AF_{inh} \times D_1 \times D_2 \times D_3 \times D_4}{LE}$$	Equation 1

Where:
D_V = dose from inhalation of COPC in indoor air (mg/m^3)
C_A = COPC concentration predicted in indoor air (mg/m^3)
AF_{inh} = bioavailability via inhalation (unitless)
D_1= hours per day exposed (hrs/day)
D_2= days per week exposed / 7 days
D_3= weeks per year exposed / 52 weeks
D_4= total years exposed to site (for carcinogens only)
LE = life expectancy (yr) (for carcinogens only)

Inhalation of naphthalene in indoor air for the toddler resident:

D_V = 0.32 mg/m^3 x 1 x 22.5 hrs/24 hrs x 7 days/7 days x 52 wks/52 wks

D_V = **0.3 mg/m^3**

Inhalation of benzene (as a carcinogen) in indoor air for the adult resident:

$$D_V = \frac{1.46\text{ E-04 mg/m}^3 \times 1 \times 22.5\text{ hrs/24 hrs} \times 7\text{ days/7 days} \times 52\text{ wks/52 wks} \times 60\text{ years}}{60\text{ years}}$$

D_V = **1.37 E-04 mg/m^3**

2.0 HAZARD/RISK ESTIMATION:

$$\text{Hazard Quotient (HQ)} = \frac{\text{Estimated Exposure (Dose) (mg/kg bw/day)}}{\text{Tolerable Daily Intake (TDI) (mg/kg bw/day)}}$$

Hazard/Risk Estimate for the inhalation pathway for naphthalene for the toddler resident:

$$HQ = \frac{Inhalation\ Dose\ (mg/m^3)}{Tolerable\ Concentration\ (mg/m^3)}$$

$$HQ = \frac{0.30\ (mg/m^3)}{0.003\ (mg/m^3)}$$

HQ = 100

Integrated Lifetime Cancer Risk (ILCR) Estimate for inhalation pathways for benzene for the adult resident:

ILCR = indoor vapour inhalation dose x unit risk

ILCR = (1.37 E-04 mg/m^3) x 0.0033 $(mg/m^3)^{-1}$

ILCR = 4.52 E-07

3.0 REFERENCES

USEPA. 2004. Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Final. EPA/540/R/99/005. OSWER 9285.7-02EP, PB99-963312. July 2004.

APPENDIX E

Toxicity Reference Values

Table E-1
Toxicity Reference Values
Canada Creosote Site, North Bow River, Calgary, Alberta

COPC	Carcinogen Classification [a]			Assessed as a Carcinogen?	Relative Potency Factor						
	Health Canada	IARC	US EPA			RfC mg/m^3	Target Organ/Effect	Source (RfC)	IUR $(mg/m^3)^{-1}$	Target Organ/Effect	Source (IUR)
Volatile Organic Compounds											
Acetaldehyde	NC	2B	B2	Yes		0.009	Degeneration of olfactory epithelium	US EPA IRIS, 2013a	2.20E-03	Nasal squamous cell carcinoma or adenocarcinoma	US EPA IRIS, 2013a
Benzene	I	1	A	Yes		0.03	Decreased lymphocyte count	US EPA IRIS, 2013a	3.30E-03	Leukemia	IUR (AENV, 2010a) Target organ/effect (US EPA IRIS, 2013a)
Bromodichloromethane	NC	2B	B2[c]	Yes					3.70E-02	Kidney (tubular cell adenoma and tubular cell adenocarcinoma)	RSL (CalEPA)
Butadiene (1,3-)	NC	1	B2	Yes		0.002	Ovarian atrophy	US EPA IRIS, 2013a	3.00E-02	Leukeumia incidence	US EPA IRIS, 2013a
Carbon tetrachloride	III[c]	2B	B2	Yes		0.00313	Fatty changes in the liver	US EPA IRIS, 2013a (AENV 2010a)	1.50E-02	Liver tumors and pheochromocytoma (neuroendocrine tumor)	US EPA IRIS, 2013a (AENV 2010a)
Chloroform	NC	2B	B2	Yes		0.04475	Moderate to marked fatty cyst formation in the liver and elevated serum glutamate-private transaminase (SGPT). Derived from oral RfD.	US EPA IRIS, 2013a (AENV 2010a)	2.30E-02	Hepatocellular carcinoma	US EPA IRIS, 2013a (AENV 2010a)
Ethylbenzene	N/C	2B	D	No		1	Developmental toxicity	US EPA IRIS, 2013a (AENV 2010a)			
Hexachlorobutadiene	NC	3	C	Yes		-			2.20E-02	Renal tubular adenomas and adenocarcinomas	US EPA IRIS, 2013a (AENV 2010a)
Methanol	NC	NC	NC	No		2.2	Liver enzyme changes and brain weight reduction.	US EPA IRIS, 2013a (AENV 2010b)	-		
Naphthalene	NC	2B	NC	No		0.003	Nasal effects: hyperplasia and metaplasia in respiratory and olfactory epithelium, respectively	US EPA IRIS, 2013a (AENV 2010a)	3.4E-02	Nasal respiratory epithelial adenoma and nasal olfactory epithelial neuroblastoma	US EPA RSL, 2013b (US EPA, 2009)
Nonane (n-)	N/C	N/C	N/C	No		0.2	Systemic effects: clinical signs (salivation and lacrimation) and decreased body weight	US EPA RSL, 2013b (US EPA, 2009)			
1,1,1,2-Tetrachloroethane	N/C	2B	C	Yes		-			7.40E-03	Hepatocellular adenoma or carcinoma. Derived from oral data.	US EPA IRIS, 2013a
Trichloroethylene	II	1	A	Yes		0.04	Central nervous system toxicity	CCME, 2007 (AENV, 2010a)	6.10E-04	Leydig cell tumours in testes	Health Canada, 2010 (AENV 2010a)
Trimethylbenzene (1,2,3-)	N/C	N/C	N/C	No		0.005	Decreased pain sensitivity	US EPA RSL, 2013b (US EPA 2010)	-		
Trimethylbenzene (1,2,4-)	NC	NC	NC	No		0.007	Hematological effects (decreased clotting)	US EPA RSL, 2013b (US EPA 2007)	-		
Xylene (m- & p-)	N/C	N/C	N/C	No		0.1	Impaired motor coordination	US EPA RSL, 2013b (US EPA IRIS, 2013)	-		
Xylene (o-)	N/C	N/C	N/C	No		0.1	Impaired motor coordination	US EPA RSL, 2013b (US EPA IRIS, 2013)	-		
Xylene (total)	IV	3	N/C	No		0.18	Maternal effects, fetal retardation, increased proportion of fetal mortality and resorbed fetuses	Health Canada, 2010 (AENV 2010a)	-		
Petroleum Hydrocarbons											
CCME F1											
Aliphatics C_6-C_8	NC	NC	NC	No		18.4	Neurotoxicity	CCME, 2008	–		
Aliphatics C_8-C_{10}	NC	NC	NC	No		1.0	Hepatic and hematological changes	CCME, 2008	–		
Aromatics C_8-C_{10}	NC	NC	NC	No		0.2	Decreased body weight	CCME, 2008	–		
CCME F2											
Aliphatics $C_{>10}$-C_{12}	NC	NC	NC	No		1	Hepatic and hematological changes	CCME, 2008	-		
Aliphatics $C_{>12}$-C_{16}	NC	NC	NC	No		1	Hepatic and hematological changes	CCME, 2008	-		
Aromatics $C_{>10}$-C_{12}	NC	NC	NC	No		0.2	Decreased body weight	CCME, 2008	-		
Aromatics $C_{>12}$-C_{16}	NC	NC	NC	No		0.2	Decreased body weight	CCME, 2008	-		

Notes:
"-" no information available or not applicable
NC - not classified
COPC - Contaminant of Potential Concern
US EPA - United States Environmental Protection Agency, IRIS - Integrated Risk Inform
RfC - reference concentration
IARC - International Agency for Research on Cancer
IUR - inhalation unit risk
RfCs are in mg/m^3, IURs are in $(mg/m^3)^{-1}$
a - Health Canada classifications are from Health Canada 2010; US EPA classifications are from US EPA IRIS (2013).
b- Oral RfD (mg/kg·d) adopted as inhalation RfC not available.

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