APPENDIX A

PHASE III ENVIRONMENTAL SITE ASSESSMENT
(EGE, 2012)

PUBLIC WORKS AND
GOVERNMENT SERVICES CANADA

RCMP F Division
Phase III Environmental Site Assessment
RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan

February 2012

PWGSC Project No.: R.042523.005

Prepared for:

Public Works and Government Services Canada
Environmental Services
100 - 167 Lombard Avenue
Winnipeg, Manitoba R3C 2Z1

Prepared by:

EGE Engineering Ltd.
511 Pepperloaf Cres.
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EGE Engineering Ltd.
Engineering, **G**eosciences & **E**nvironmental

February 17, 2012, File: 0125 036 01

Public Works and Government Services Canada
100 -167 Lombard Avenue
Winnipeg, Manitoba
R3C 2Z1

Attention: **Ms. Joan La Rue-van Es, P.Eng.**
Environmental Specialist

RE: RCMP F Division - Phase III Environmental Site Assessment
RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan

Dear Ms. La Rue-van Es:

EGE Engineering Ltd. (EGE) is pleased to submit the following report on the Phase III Environmental Site Assessment (ESA) completed at the RCMP Hangar located at 190 Airport Road in Prince Albert, Saskatchewan. The Phase III ESA was conducted to further assess, and delineate, an area of petroleum hydrocarbon impacted soil and groundwater that was identified during a previous Phase II ESA undertaken at the site in 2010, report dated April 2011. The impacted area is associated with the presence of an underground fuel storage tank, and fuel dispensing pump and line, which contains Jet A fuel used by RCMP aircraft at the hangar.

Should you have any questions or require any additional information on the report please contact the undersigned at (204) 226-7378 or Mr. David Klassen at (204) 612-0944.

Sincerely,

EGE ENGINEERING LTD.

Larry Bielus, M.Sc., P.Eng.
Senior Geological Engineer
Lpb/lb

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Executive Summary

EGE Engineering Ltd. (EGE) was retained by Public Works and Government Services Canada (PWGSC), on behalf of the Royal Canadian Mounted Police (RCMP), to conduct a Phase III Environmental Site Assessment (ESA) at the RCMP Hangar located in Prince Albert, Saskatchewan.

Project Objectives

The specific project objectives included: a detailed intrusive Phase III ESA investigation to determine the type of contamination at the site in all media, the source of contamination, the extent and volume of contamination, and the likelihood of contaminant migration off-site; further characterization of the site with respect to the local and regional geology, hydrogeology, and hydrology; development of a Remedial Options Evaluation, including associated costs; classification of the impacted site, according to the 2008 Canadian Council of Ministers of the Environment (CCME) National Classification System for Contaminated Sites (NCSCS); and preparation of a summary report based on the findings from the intrusive site investigation program.

Scope of Work

The Phase III ESA was conducted following the principals and general practices set out by the Canadian Standards Association guideline Z769-00 Phase II Environmental Site Investigation (R2004). The work plan included the development, and implementation, of a field and analytical program that targeted: an area of petroleum hydrocarbon impacted soil and groundwater, which is associated with the current and former underground storage tanks (USTs), and fuel dispensing stand northeast of the hangar; an unlined drainage pit on the east side of the hanger that receives drainage from inside the hangar; a diesel generating unit east of the hangar; and an interior waste oil storage tank located in the chemical room at the southwest corner of the hangar. The field investigation included: drilling twenty-one test holes that focused on potential impacts within the soil; and the installation of nineteen monitoring wells to supplement the six existing wells and to assess potential impacts to the underlying groundwater quality.

Site Description

The RCMP Hangar is located at 190 Airport Road in the northeast part of the City of Prince Albert, Saskatchewan. The property consists of a 45.70 by 97.50 m rectangular shaped lot with an area of 4,457 m^2. The property is currently occupied by a 980 m^2 single-storey building, reportedly constructed in 1973. The building has a slab-on-grade foundation and is situated in the center of the site. A 16 m^2 storage shed is also located adjacent to the northeast corner of the building.

The property is accessed via an asphalt roadway from the south, which leads to an asphalt parking area along the south side of the building, an asphalt access road along the west side of the building and an asphalt tarmac on the north side of the property. A concrete apron is present between the north side of the building and the asphalt tarmac. Grassed areas are present at the southeast and southwest corners of the property, along the east side of the property, and between the asphalt pavement and west property line on the west side of the site.

Surrounding land use consists of the City of Prince Albert Airport property to the north, east and south, including the main terminal building, runway, taxiways, airport garage and undeveloped grassed areas. Directly west of the property is the Prince Albert Shopper building (a newspaper publishing business), an airplane maintenance building (Elite Aero) and an aviation business (National Aviation). The RCMP Hangar is located 80 m north of Airport Road and 1.2 km southeast of the intersection of Airport Road and Provincial Highway 55 in the City of Prince Albert, Saskatchewan. Prince Albert is located 135 km northeast of Saskatoon, Saskatchewan.

The local topography at the site is relatively flat and is situated at an elevation of approximately 429 m above sea level. The nearest surface water body to the RCMP Hanger is the North Saskatchewan River, located 430 m to the southwest. Potable water for the RCMP and surrounding airport properties is supplied by the City of Prince Albert municipal water system, which is drawn from the North Saskatchewan River, approximately 6 km upstream of the Prince Albert Airport.

Background

A Phase I ESA was previously conducted at the site by PHH ARC Environmental (PHH ARC) in July 2009, with the report dated January, 2010. The Phase I ESA identified six areas of potential environmental concern (APECs), including:

- a 45,000 L fibreglass UST, containing Jet A fuel associated with an aviation fuel dispensing stand northeast of the hangar;
- an inactive UST located south of the active UST, which was associated with a former fuel dispensing stand that is no longer in service;
- an area of hydrocarbon staining located beneath a diesel-fired back-up generator on the east side of the hangar;
- a mobile aboveground storage tank (AST), containing salvaged aviation fuel located inside the storage shed on the east side of the hangar;
- a waste oil storage tank located inside the chemical room in the hangar, which also contains a floor sump pit at the southwest corner of the hangar; and
- an unlined disposal pit located east of the hangar building and south of the UST area, which receives floor wash water from the hangar.

Based on the findings from the PHH ARC Phase I ESA, Kontzamanis Graumann Smith MacMillan Inc. (the KGS Group) were retained by PWGSC, on behalf of the RCMP, to conduct a Phase II ESA in October 2010, report dated April 2011, that targeted the APEC associated with the current, and former USTs and fuel dispensing stands. As part of the Phase II ESA program, eight test holes were drilled around the location of the existing UST and suspected location of the inactive UST, in order to confirm the presence/absence of petroleum hydrocarbon impacted soil.

Eight soil samples, one from each test hole, were submitted for laboratory analysis of benzene, toluene, ethylbenzene and xylenes (the BTEX parameters), and the petroleum hydrocarbon (PHC) F1 to F4 Fractions. Four of the eight soil samples, exceeded the selected CCME Canadian Environmental Quality Guidelines (CEQG) and Canada Wide Standard (CWS) for one or more of the BTEX parameters and the

PHC F1 and F2 Fractions, respectively. The impacts are located in a coarse grained sand layer, which is situated below the fine grained surface soil, and above the underlying fine grained silt and clay soils, between a depth of 3.0 and 4.0 m. Vertical delineation of the impacted soil was not achieved, as no samples were submitted from below the impacted sand layer. Horizontal delineation was also incomplete north and east of the UST area. Therefore, the volume of impacted soil was not determined in the Phase II ESA. The location of the impacted soil was found northeast, east and southeast of the UST area. The test holes to the south and west did not report any exceedances.

Four of the eight test holes, were completed as groundwater monitoring wells. Groundwater levels ranged from 3.117 to 3.375 m below grade and the general direction of groundwater flow was determined to be towards the northeast at a gradient of 0.0046 m/m. The regional groundwater flow was noted to be to the southwest towards the North Saskatchewan River.

Light non-aqueous phase liquid (LNAPL), was detected at a fifth well discovered on-site. The well was not installed during the Phase II ESA, but was found directly northwest of the UST and was suspected to be located within the UST backfill material. The measured LNAPL thickness at this well was 0.362 m. The four wells installed during the Phase II ESA did not have any measurable LNAPL, however, three of the four groundwater samples submitted for analysis exceeded the Health Canada Canadian Drinking Water Quality Guidelines (HC-CDWQG) for the BTEX parameters and the Federal Contaminated Sites Action Plan (FCSAP) Federal Interim Groundwater Quality Guidelines (FIGQG) for the PHC F2 Fraction. Horizontal delineation of the impacted groundwater was not obtained in any direction, therefore, the area of impacted groundwater was not determined, as part of the Phase II ESA.

A Leak Detection Report, prepared by Cantest Solutions Inc. (Cantest), dated June 10, 2010, identified a leak at the bottom of the fibreglass riser pipe leading to the fuel dispensing stand. The leak was determined to be the result of a nail used to hold down a rodent screen, which had punctured the line. The line was repaired with double-walled piping in October 2010, at which time, the KGS Group also completed a soil sampling program to confirm the presence/absence of any subsurface hydrocarbon impacts from the leaking UST fuel piping that was being replaced.

Six shallow soil samples were collected from the excavated trench where the leaking fuel pipe had been removed and replaced. Each of the samples were collected from a depth of 0.5 m below ground and were collected from between the UST access manhole and the concrete apron near the fuel dispensing stand. There was no estimate provided regarding how long the leak had occurred or how much fuel had been lost. Reconciled tank dip measurements were not available for review by the KGS Group. The three samples closest to the leak source at the fuel dispensing stand reported PHC F2 Fraction exceedances of the CCME CWS. The sample closest to the leak, also exceeded the CCME CEQG for xylenes and the CCME CWS for the PHC F1 Fraction. The most recent leak detection test, conducted by Cantest on June 13, 2011, indicated that there were no leaks in either the UST or the fuel line.

Based on the findings presented in the previous Phase I ESA, Phase II ESA and Fuel Line Investigation reports, PWGSC and the RCMP determined that a Phase III ESA was required to delineate the extent of soil and groundwater impacts associated with the former/current USTs, and fuel dispensing system.

Phase III ESA Findings

As part of the Phase III ESA, soil samples were collected at regular intervals from each of the test hole locations and the samples screened in the field for combustible organic vapour levels. The majority of the vapour readings were below 50 parts per million (ppm) and reflect background concentrations. There were a select number of samples with slightly to moderately elevated readings that were between 50 and 500 ppm. These samples were typically from above and/or below the identified zones of soil impact, and from the test holes located around the margins of the more highly impacted test hole locations.

Within the area of the former and active USTs, highly elevated readings (greater than 500 ppm) were noted at seven of the test hole locations. In all cases, the combustible organic vapour readings in the samples from above these zones were near background levels or slightly to moderately elevated and vapour readings returned to background levels below these zones. In all cases, the highly elevated vapour readings were within the layer of sand that is located below the fine grained surface soil, and above the underlying fine grained silts and clays.

Thirty-two soil samples were subsequently submitted for laboratory analysis of the BTEX components and the PHC F1 to F4 Fractions. The samples were generally chosen based on analyzing the samples with the highest combustible organic vapour reading at each of the test hole locations. This included: all of the samples with the highly elevated vapour readings and presence of hydrocarbon odors; and select background samples from above and below these zones, and from the margins of the impacted test hole locations.

Six of the submitted soil samples exceeded one or more of the selected CCME CEQG and CWS values for benzene, and the PHC F1 and F2 Fractions. There were no exceedances for toluene, ethylbenzene, xylenes or the PHC F3 and F4 Fractions. This included all of the background samples, and the samples with the slightly to moderately elevated vapour readings from above and below the impacted soil, and from the test hole locations around the perimeter of the impacted area. In most cases, the reported values were below the laboratory method detection limits.

As noted above, four of the eight samples submitted from the previous Phase II ESA also exceeded one or more of the selected CCME CEQG and CWS values for benzene, and the PHC F1 and F2 Fractions. There was also one sample, which exceeded the criteria for xylene.

The exceeded values are from the test holes located in, and around, the area of the former and active USTs. There were no exceedances in the samples collected in the area of the diesel generator on the east side of the hangar or at the southwest corner of the hangar in the area of the interior waste oil tank. Impacts were noted in the test holes completed in, and around, the storage shed and drainage pit at the northeast corner of the hangar, however, these impacts are believed to be associated with the UST area.

The lateral extent of petroleum hydrocarbon impacted soil is estimated at 1,500 m^2. The plume extends in all directions from the former and active UST area, however, there is further spreading of the plume towards the north and east, which is consistent with the established local shallow groundwater flow direction. The impacted plume likely extends under the northeast corner of the RCMP Hangar, however, there were no test holes drilled through the concrete slab inside the hangar, as part of the Phase III ESA, to confirm this potential. The impacted soil plume also extends beyond the RCMP leased property onto the City of Prince Albert Airport lands to the east and north. However, there is closure of the plume in all directions.

Vertically, the soil impacts appear to be limited to the lower portion of the sand layer, and other than some residual impacts, do not extend into the underlying clay and silt layers. Based on the combustible organic vapour readings, and laboratory results, the upper boundary of impacted soil is assumed to be at 3.20 m below ground and the lower boundary at a depth of 4.2 to 4.5 m below ground. This equates to an impacted thickness of between 1.0 and 1.3 m. Using a value of 1.2 m, as the average thickness of the impacted layer, and an area of 1,500 m^2, the volume of petroleum hydrocarbon impacted soil is estimated to be 1,800 m^3. The volume of non-impacted soil situated above the impacted layer is estimated to be 4,800 m^3, less a small area of surface impact that was noted at the fuel dispensing stand during the repair to the leaking fuel line. This area of surficial impact corresponds to approximately 2 m^3 of petroleum hydrocarbon impacted soil.

Three soil samples were also submitted for metal, VOC, glycol and oil/grease analysis, to assess the location of the unlined drainage pit on the east side of the building, which receives drainage water from the hangar, and the area at the southwest corner of the hangar, near the location of the interior waste oil tank and sump pit, which are located in the chemical room. All of the results were below the laboratory method detection limits or the selected CCME CEQG. Based on the results, the soil in these two areas does not appear to have been impacted by metals, VOCs, glycols or oil/grease.

Nineteen monitoring wells were installed, as part of the Phase III ESA: to supplement the six existing on-site wells (four wells from the Phase II ESA and two wells located in the UST backfill material); to assist in delineating the extent of petroleum hydrocarbon impact in the groundwater; and to also assess the potential for metal, VOC, glycol and oil/grease impacts in the groundwater from other on-site areas of environmental concern.

Based on the October 4, 2011 water level measurements, the calculated piezometric elevations ranged from 96.144 m northeast of the UST to 96.607 m at the northwest corner of the hangar, and indicate flow is to the north and northeast at a gradient of 0.02 to 0.05 m/m. The interpretation excluded the two wells installed within the UST backfill materials and the piezometric elevations were adjusted upward to include the LNAPL thickness, where present. The interpreted groundwater flow is consistent with the findings from the previous Phase II ESA. The vertical gradient, based on the water level measurements recorded at the two nested well pairs, appears to be upward at 0.014 to 0.032 m/m.

Field screening of combustible organic vapours in the wells showed elevated readings of greater than 500 ppm at eight locations. Where multiple sets of readings were obtained, the vapour concentrations were noted to decrease over time at fifteen wells, increase at four wells and remain constant at two wells.

LNAPL was detected at ten monitoring well locations and covers an area of approximately 1,100 m^2. The identified plume extends in all directions from the former and active UST area, however, there is further spreading of the plume towards the north and east, which is consistent with the established local shallow groundwater flow direction. The impacted plume likely extends under the northeast corner of the RCMP Hangar, however, there were no test holes drilled through the concrete slab inside the hangar, as part of the Phase III ESA, to confirm this potential. The LNAPL plume also extends beyond the RCMP leased property onto the City of Prince Albert Airport lands to the east and north. However, there is closure of the plume in all directions. Based on the October 4, 2011 measurements, the average thickness of the LNAPL was 0.310 m. Multiplying the average LNAPL thickness by the area of the plume and assuming an effective porosity of 0.25, an order of magnitude estimate for the volume of LNAPL present at the site is 85,000 litres.

Samples of the LNAPL were collected from three of the monitoring wells and one sample of the Jet A fuel was also collected directly from the active UST. The results were relatively consistent, and indicate the highest concentrations are for the PHC F1 Fraction, followed by the PHC F2 Fraction and xylenes. This profile and the resultant chromatograms are consistent with a Jet A petroleum hydrocarbon profile.

In-situ field measurement of temperature, conductivity, total dissolved solids (TDS), dissolved oxygen (DO), pH, oxygen reduction potential (ORP) and turbidity was also completed as part of the Phase III ESA field program. A review of the individual results showed some trending to higher conductivity and TDS values in the wells further afield to the north, east and southeast. The recorded DO and ORP values were also generally higher at the perimeter wells in comparison to the central points. Although not definitive at this time, the results would suggest that there is some natural bio-degradation occurring in the area of the impacted plume.

Representative samples of the groundwater were collected from each of the wells where LNAPL was not present. The collected samples were submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. Two of the submitted samples exceeded the selected FCSAP FIGQG for the PHC F2 Fraction. The wells with LNAPL are also assumed to exceed the selected criteria. At the two nested well pairs, the two shallow wells contained LNAPL, while the corresponding deep wells did not. The samples from the two deep wells were also both below the selected FCSAP FIGQG, indicating limited vertical contaminant movement.

Based on the above findings, the lateral extent of impacted groundwater covers an area of approximately 1,500 m^2. The identified plume extends in all directions from the former and active UST area, however, there is further spreading of the plume towards the north and east, which is consistent with the established local shallow groundwater flow direction. The impacted plume likely extends under the northeast corner of the RCMP Hangar, however, there were no test holes drilled through the concrete slab inside the hangar, as part of the Phase III ESA, to confirm this potential. The plume also extends beyond the RCMP leased property onto the City of Prince Albert Airport lands to the east and north. However, there is closure of the plume in all directions.

A sensitivity analysis, utilizing the drinking water criteria from the HC-GCDWQ, indicates that two additional wells, one to the west and one to the northeast, would also show exceedances for the BTEX parameters. The extent of impacted groundwater, exceeding the HC-GCDWQ, covers an area of 2,500 m^2. Laterally, there is still closure of the impacted groundwater plume in most directions. The two exceptions are a small area to the northeast and a small area to the west.

Three groundwater samples were also submitted for metal, glycol and oil/grease analysis, along with two groundwater samples for VOC analysis, to assess the location of the unlined drainage pit on the east side of the building, which receives drainage water from the hangar, and the area at the southwest corner of the hangar, near the location of the interior waste oil tank and sump pit, which are located in the chemical room. All of the results were below the laboratory method detection limits or the selected FCSAP FIGQG and/or HC-GCDWQ. The exception was elevated levels of manganese. However, the selected HC-GCDWQ value for manganese is an aesthetic objective and does not pose a risk to human health or the environment. The elevated values may also represent naturally occurring levels in the groundwater. The HC-GCDWQ values were used where there were no applicable FCSAP FIGQG. Based on the results, the groundwater in these two areas does not appear to have been impacted by metals, VOCs, glycols or oil/grease.

The site was scored using the 2008 NCSCS and based on answering “yes” to Question 6 on the pre-screening form, indicating that LNAPL is present in the exposure zone, the site was automatically assigned a Site Classification Category of 1, indicating that the site is a High Priority for Action. However, the total score for the site was still calculated for comparison with other Class 1 sites and was scored at 64.4 out of 100.

Conclusions and Recommendations

Based on the presence of LNAPL on the property, immediate action is required to address the recovery of LNAPL before options can be considered for remediation or risk management of the impacted soil and groundwater. To facilitate removal of the LNAPL, it is recommended to install a minimum of two large diameter recovery wells in the central area of the LNAPL plume. These large diameter recovery wells should be at least 0.75 m in diameter and should be screened over the area of impact, from 3.0 to 4.5 m below ground. The LNAPL can then be pumped directly from the recovery wells, via a manual or automated pumping system, into temporary drums or an AST. Due to the volume of LNAPL present on site, manual bailing is not considered viable. The rate of LNAPL recovery should be monitored on a regular basis and the program adjusted, as required, to maximize the rate of recovery.

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1.0 INTRODUCTION AND SCOPE

EGE Engineering Ltd. (EGE) was retained by Public Works and Government Services Canada (PWGSC), Environmental Services Branch - Western Region, on behalf of the Royal Canadian Mounted Police (RCMP), to conduct a Phase III Environmental Site Assessment (ESA) at the RCMP Hangar located at 190 Airport Road in Prince Albert, Saskatchewan. Prince Albert is located along Provincial Highways 2 and 11 on the North Saskatchewan River. The subject property consists of a single-storey hangar and small shed. The property is located at the Prince Albert Airport, on the north side of the North Saskatchewan River, and is approximately 0.45 ha in size. The program was completed under the Environmental Services Supply Agreement, PWGSC File Number R.042523.005 and in accordance with EGE's proposal for environmental services dated June 27, 2011 (1).

The Phase III ESA was conducted following the principals and general practices set out by the Canadian Standards Association (CSA) guideline Z769-00 Phase II Environmental Site Investigation R2004 (2). As outlined in the Terms of Reference (3), the specific project objectives included:

- A detailed intrusive Phase III ESA investigation to determine the type of contamination at the site in all media, the source of contamination, to delineate the extent and calculate the volume of contamination, and to determine the likelihood of contaminant migration off-site;

- Further characterization of the site with respect to the local and regional geology, hydrogeology, and hydrology, in order to characterize the groundwater direction and flow;

- Development of a Remedial Options Evaluation with a minimum of two options to address the impacted soil and groundwater, including associated costs;

- Development of an indicative estimate of liability or contingent liability, as per the Treasury Board Secretariat reporting requirements;

- Classification of the impacted site, according to the 2008 Canadian Council of Ministers of the Environment (CCME) National Classification System for Contaminated Sites (NCSCS) (4); and

- Preparation of a summary report based on the findings from the intrusive site investigation program.

The work plan included the development, and implementation, of a field and analytical program that targeted one area of impact, as documented in an earlier Phase II ESA report prepared by the KGS Group, dated April 2011 (5), as well as, three additional areas identified by EGE. This included: an area of petroleum hydrocarbon impacted soil and groundwater, which is associated with the current and former underground storage tanks (USTs), and fuel dispensing stand northeast of the hangar; an unlined drainage pit on the east side of the hanger that receives drainage from inside the hangar; a diesel generating unit east of the hangar; and an interior waste oil storage tank located inside the chemical room at the southwest corner of the hangar. The field investigation included: drilling twenty-one test holes that focused on potential impacts within the soil; and the installation of nineteen monitoring wells to supplement the six existing wells and to assess potential impacts to the underlying groundwater quality.

The following report provides: a description of the site; an overview of the previous site investigation program; details on the current investigation methodology; a discussion on the regional and local geological, hydrological, and hydrogeological conditions; the results of the analytical program; an evaluation of applicable remedial options; and a discussion on the findings, including conclusions/recommendations.

1.1 SITE DESCRIPTION

The RCMP Hangar (DFRP 14477 - PR F/266 - BU F/262) is located at 190 Airport Road in the northeast part of the City of Prince Albert, Saskatchewan. The property consists of a 45.70 by 97.50 m rectangular shaped lot with an area of 4,457 m^2. The property is currently occupied by a 980 m^2 single-storey building, reportedly constructed in 1973. The building has a slab-on-grade foundation and is situated in the center of the site. A 16 m^2 storage shed is also located adjacent to the northeast corner of the building.

The property is accessed via an asphalt roadway from the south, which leads to an asphalt parking area along the south side of the building, an asphalt access road along the west side of the building and an asphalt tarmac on the north side of the property. A concrete apron is present between the north side of the building and the asphalt tarmac. Grassed areas are present at the southeast and southwest corners of the property, along the east side of the property, and between the asphalt pavement and west property line on the west side of the site.

Surrounding land use consists of the City of Prince Albert Airport property to the north, east and south, including the main terminal building, runway, taxiways, airport garage and undeveloped grassed areas. Directly west of the property is the Prince Albert Shopper building (a newspaper publishing business), an airplane maintenance building (Elite Aero) and an aviation business (National Aviation).

The RCMP Hangar is located 80 m north of Airport Road and 1.2 km southeast of the intersection of Airport Road and Provincial Highway 55 in the City of Prince Albert, Saskatchewan. Prince Albert is located 135 km northeast of Saskatoon, Saskatchewan. A location and area plan are presented as Figure 01. The current features on the property and adjacent land uses are illustrated on Figure 02, and a plan of the site is illustrated on Figure 03.

1.2 SURFICIAL CONDITIONS

The property consists of the building footprint, which is situated in the center of the site, an asphalt parking area to the south, an asphalt access road on the west side of the hangar, and a concrete apron and asphalt tarmac to the north. The remaining areas to the west, south and east are landscaped with grass. The site is accessible off of Airport Road to the south. The property is gently sloped from the north to the southwest and is at a similar grade to the surrounding properties. Surface runoff is directed south to local catch basins and drainage ditches along Airport Road. There was no evidence of standing water noted at the time of the site investigation. Photos 01 through 04 below provide views of the property and surficial conditions, as of August, 2011.

*Photo 01 - View of the south side (front) of the RCMP Hangar looking north.
The Prince Albert Shopper building is located to the west on the left side of the photograph.*

*Photo 02 - View of the north side of the RCMP Hangar looking south.
The fuel dispensing stand is visible on the concrete apron on the left side of the photograph.*

Photo 03 - View of the west side of the RCMP Hangar looking north towards Taxiway Bravo. The adjacent building to the left (west) is the Prince Albert Shopper.

Photo 04 - View of the east side of the RCMP Hangar looking north. The diesel generator (yellow)on the east side of the building is also shown.

1.3 LEGAL AND FEDERAL DESCRIPTIONS

The limits of the property can be seen on Figures 02 and 03, and the property is legally described by Title Number 113657946 as:

- *Lot 2, Block 103, Plan 78PA07887, Surface Parcel Number 133978102, Prince Albert, Saskatchewan - NE ¼ Section 11, Township 49, Range 26 West of the 2nd Meridian.*

According to the land title provided in the Phase I ESA report prepared by PHH ARC Environmental Ltd, dated January 2010 (6), the property is owned by the City of Prince Albert and leased to Her Majesty the Queen in Right of Canada, care of the RCMP. The lease began November 15, 1997 for a term of five years, with options to renew for an additional three five year terms. This lease was last registered on October 30, 2008.

The Property ID number, Building ID number, Directory of Federal Real Property (DFRP) number, Federal Contaminated Site Inventory (FCSI) number, building description and site address are tabled below.

Building Description	Site Address	Property ID	Building ID	DFRP	FCSI
RCMP Hangar	190 Airport Road	PR F/266	BU F/262	14477	00022511

1.4 BACKGROUND

1.4.1 Phase I Environmental Site Assessment

A Phase I ESA was previously conducted at the site by PHH ARC Environmental in July 2009, with the report dated January, 2010 (6). The Phase I ESA identified six areas of potential environmental concern (APECs), including:

- a 45,000 L fibreglass UST, containing Jet A fuel associated with an aviation fuel dispensing stand northeast of the hangar;
- an inactive UST located south of the active UST, which was associated with a former fuel dispensing stand that is no longer in service;
- an area of hydrocarbon staining located beneath a diesel-fired back-up generator on the east side of the hangar;
- a mobile aboveground storage tank (AST), containing salvaged aviation fuel located inside the storage shed on the east side of the hangar;
- a waste oil storage tank located inside the chemical room in the hangar, which also contains a floor sump pit at the southwest corner of the hangar; and
- an unlined disposal pit located east of the hangar building and south of the UST area, which receives floor wash water from the hangar.

Representative photos of these APECs are provided in Photos 05 through 10 below.

Photo 05 - UST manhole and fuel line trench leading to the fuel dispensing stand.

Photo 06 - Fuel dispensing stand.

Photo 07 - Outline of former fuel dispensing stand to the south of the current stand.

Photo 08 - View of current UST, fuel dispensing stand and existing monitoring well (MWSE).

There were no details available on the capacity, condition or contents of the suspected inactive UST, which was associated with the former fuel dispensing stand, however, the location was noted to be south of the current UST and dispensing stand. A monitoring well was observed northwest of the UST, however, there was no indication of when it was installed or details provided on the construction drawings. Based on these findings, PHH ARC recommended that a Phase II ESA be conducted at the area of the current and former USTs and fuel dispensing stand.

The hydrocarbon staining noted on the ground surface beneath the diesel-fired back-up generator was less than one square metre. PHH ARC recommended that secondary containment be installed beneath the generator to mitigate the potential for further spills. There was no recommendation to conduct a subsurface investigation at the generator location.

Photo 09 - Stained timber cribbing and discoloured soil on the east side of the diesel generator.

One 378 L steel single-walled AST was observed inside the storage shed on the east side of the hangar. The AST is reportedly used to collect salvageable aviation fuel from aircraft. The AST was located on a dolly for ease of movement. The storage shed has a wood floor. There was no recommendation in the Phase I ESA to conduct a subsurface investigation at the location of the storage shed.

Photo 10 - Interior of storage shed and mobile AST containing salvaged aviation fuel.

At the time of the Phase I ESA, a floor sump was observed near the waste oil storage tank in the chemical room at the southwest corner of the hangar building. The sump was dry and was reportedly not connected to the sanitary sewer system. The waste oil storage tank was equipped with secondary containment and the floor surrounding the waste oil tank was clean with no evidence of staining. The Phase I ESA also identified a sump pit in the main hangar area, which was steel construction and collected water from the floor drains. It was reported that the sump was pumped out, as needed by a local contractor, however, information presented in the Phase II ESA (as discussed in Section 1.4.2 below) contradicted this information.

The adjacent land uses are highlighted on Figure 02, with land use descriptions and photos of the adjacent properties, as taken by EGE in August, 2011, provided in Photos 11 through 14 below.

Photo 11 - View looking northwest at the Prince Albert Shopper property west of the RCMP Hangar.

Photo 12 - View looking southeast at the City of Prince Albert Airport lands and terminal building.

Photo 13 - Panoramic view looking north at Taxiway Bravo and the City of Prince Albert Airport property.

Photo 14 - Panoramic view looking south at Airport Road and commercial properties.

1.4.2 Phase II Environmental Site Assessment

Based on the findings from the PHH ARC Phase I ESA, Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) were retained by PWGSC, on behalf of the RCMP, to conduct a Phase II ESA in October 2010 [(5)] that targeted the APEC associated with the current and former USTs, and fuel dispensing stands. The Phase II ESA, dated April 2011, also provided additional information regarding the sump in the main hangar area, and indicated that based on discussions with Cpl. Dolny, the floor drainage system within the hangar drained into a concrete and wood lined catchment below the building, which overflowed through a one-way valve into a drainage pipe that drained to an underground pit outside the hangar building on the east side of the property south of the UST area. The drainage pit was reported to be unlined, not equipped with drainage tiles, and it was assumed that the effluent would infiltrate directly into the surrounding soil.

As part of the Phase II ESA program, eight test holes were drilled around the location of the existing UST and suspected location of the inactive UST, in order to confirm the presence/absence of petroleum hydrocarbon impacted soil. Eight soil samples, one from each test hole, were subsequently submitted for laboratory analysis of benzene, toluene, ethylbenzene and xylenes (the BTEX parameters), and the petroleum hydrocarbon (PHC) F1 to F4 Fractions. Four of the eight soil samples, including those submitted from test holes TH2 (also referred to as MW2), TH3 (MW3), TH5 and TH6, exceeded the selected CCME Canadian Environmental Quality Guidelines (CEQG) and Canada Wide Standard (CWS) for BTEX and the PHC F1 and F2 Fractions, respectively. The impacts are located in a coarse grained sand layer, which is situated below the fine grained surface soil, and above the underlying fine grained silt and clay soils, between a depth of 3.0 and 4.0 m.

Vertical delineation of the impacted soil was not achieved, as no samples were submitted from below the impacted sand layer. Horizontal delineation was also incomplete north and east of the UST area. Therefore, the volume of impacted soil was not determined in the Phase II ESA. The location of the impacted soil was found northeast, east and southeast of the UST area. The test holes to the south and west did not report any exceedances. Plate 01 below, as taken from the Phase II ESA report, shows the location of the eight test holes and the inferred area of impacted soil.

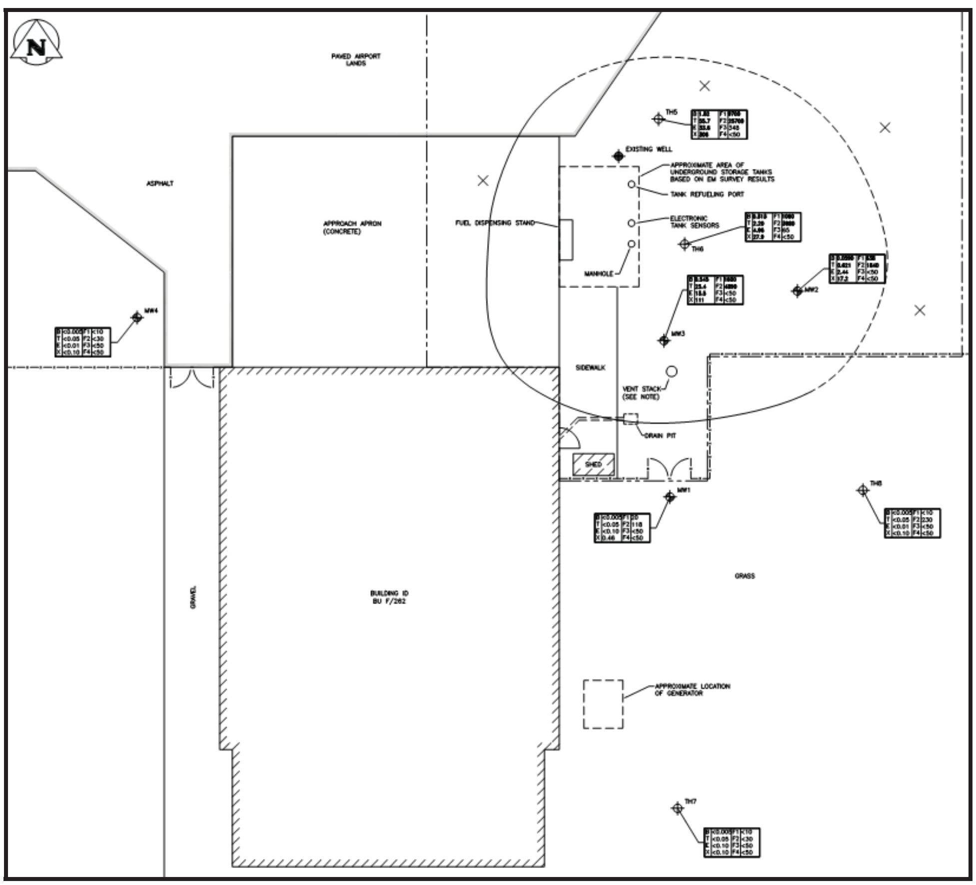

Plate 01 - Site Plan from Phase II ESA (KGS, 2011) with test hole locations and area of impacted soil.

Four of the eight test holes, TH1 through TH4 (also referred to as MW1 through MW4), were completed as groundwater monitoring wells. Combustible organic vapours were not monitored in the wells, during the Phase II ESA. Groundwater levels ranged from 3.117 to 3.375 m below grade on October 2, 2010 and the general direction of groundwater flow was determined to be towards the northeast at a gradient of 0.0046 m/m. The regional groundwater flow was noted to be to the southwest towards the North Saskatchewan River.

Light non-aqueous phase liquid (LNAPL), also known as free phase hydrocarbon product, was detected at another well discovered on-site. The well was not installed during the Phase II ESA, but was found directly northwest of the UST and was suspected to be located within the UST backfill material. The measured LNAPL thickness at this well, referred to as MWNW, was 0.362 m. The four wells installed during the Phase II ESA did not have any measurable LNAPL. Three of the four groundwater samples, from wells MW1, MW2 and MW3, exceeded the Health Canada Canadian Drinking Water Quality Guidelines (HC-CDWQG) for the BTEX parameters and the Federal Contaminated Sites Action Plan (FCSAP) Federal Interim Groundwater Quality Guidelines (FIGQG) for the PHC F2 Fraction. Horizontal delineation of the impacted groundwater was not obtained in any direction, therefore, the area of impacted groundwater was not determined, as part of the Phase II ESA.

1.4.3 Fuel Line Investigation

As outlined in a Leak Detection Report prepared by Cantest Solutions Inc., dated June 10, 2010 (7), a leak was identified at the bottom of the fibreglass riser pipe leading to the fuel dispensing stand, during routine testing of the lines and UST.

The leak was determined to be the result of a nail used to hold down a rodent screen, which had punctured the line. A series of photos, as included in the 2010 Leak Detection Report, are reproduced to the right, as Plate 02.

Plate 02 - Photographs taken from the 2010 Cantest Solutions Inc. - Leak Detection Report showing the nail puncture and leaking fuel line.

The line was subsequently repaired with double-walled piping in October 2010, at which time, the KGS Group also completed a soil sampling program to confirm the presence/absence of any subsurface hydrocarbon impacts from the leaking UST fuel piping that was being replaced [(8)]. The KGS Group collected six shallow soil samples, S1 through S6, from the excavated trench where the leaking fuel pipe had been removed and replaced. Each of the samples were collected from a depth of 0.5 m below ground and were collected from between the UST access manhole and the concrete apron near the fuel dispensing stand. There was no estimate provided regarding how long the leak had occurred or how much fuel had been lost. Reconciled tank dip measurements were not available for review by the KGS Group.

Three of the six samples, S1, S2 and S3, the three samples closest to the leak source at the fuel dispensing stand, reported PHC F2 Fraction exceedances of the CCME CWS. The sample closest to the leak, S1, also exceeded the CCME CEQG for xylenes and the CCME CWS for the PHC F1 Fraction. Plate 03 below, taken from the fuel line investigation report by the KGS Group, shows the sample locations.

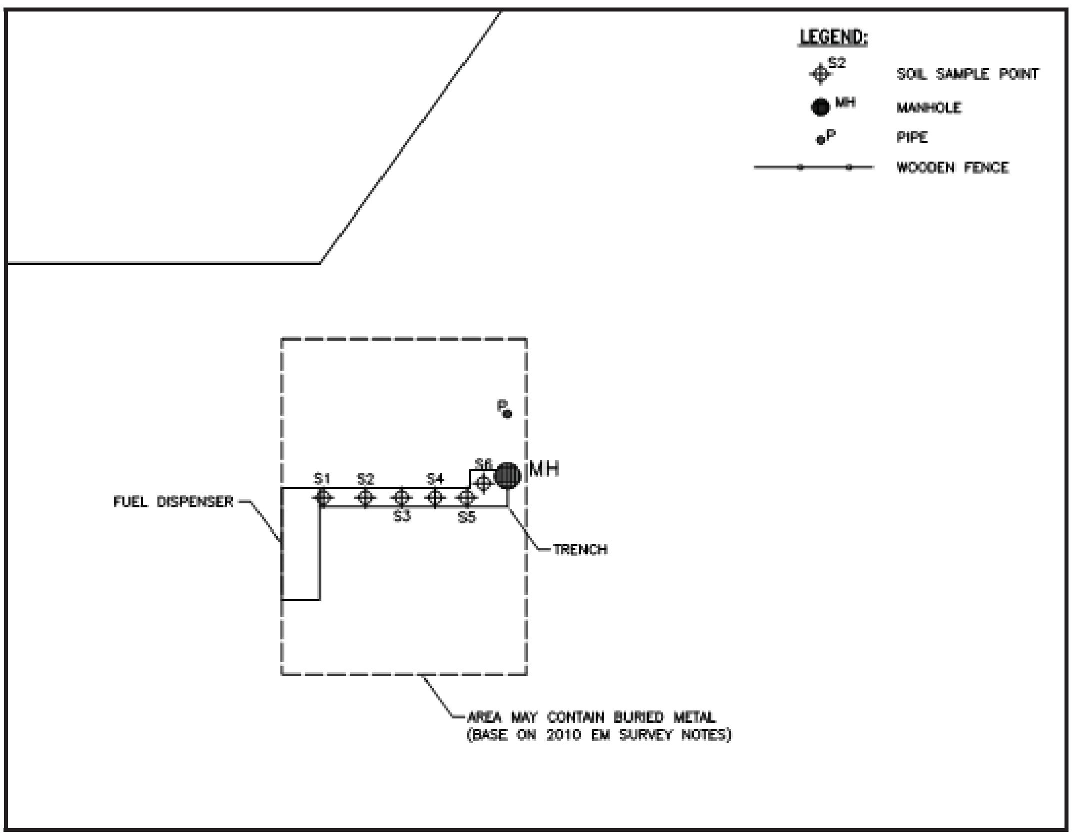

Plate 03 - Site Plan from the Fuel Line Investigation report (KGS, 2011) showing sample locations.

The most recent leak detection test, conducted by Cantest Solutions Inc. on June 13, 2011 [(9)], indicated that there were no leaks in either the UST or the fuel line.

1.4.4 Requirement for Phase III Environmental Site Assessment

Based on the findings presented in the previous Phase I ESA, Phase II ESA and Fuel Line Investigation reports, PWGSC and the RCMP determined that a Phase III ESA was required to delineate the extent of soil and groundwater impacts associated with the former/current USTs, and fuel dispensing system. The scope of work for the Phase III ESA was outlined in the *Terms of Reference - Phase III Environmental Site Assessment - RCMP Hangar Site in Prince Albert, Saskatchewan*, prepared by PWGSC and dated June 2011 [(3)].

A preliminary work plan, depicting the proposed test hole/monitoring well locations, was presented in EGE's Proposal for Environmental Services, dated June 27, 2011 [(1)]. The proposed work plan included drilling fourteen test holes on the property, all of which were to be completed as groundwater monitoring wells. Two nested monitoring well pairs were also proposed for the area near the USTs, including one well within the impacted sand unit and one well within the silty clay unit underlying the impacted sand. The test holes were located to provide both horizontal, and vertical, delineation of the impacted soil and groundwater plumes, as identified in the previous Phase II ESA. Following award of the Contract to EGE, and a subsequent meeting with PWGSC and the RCMP, it was agreed to adopt the proposed plan as presented, with the addition of two shallow test holes to be completed near the diesel generating unit on the east side of the hangar.

During completion of the field investigation, the program was revised to include one additional test hole/monitoring well to further delineate the area of soil and groundwater impact northeast of the USTs. A total of seventeen test holes, fifteen of which were completed as groundwater monitoring wells, were subsequently drilled during the Phase III ESA site investigation on August 2 and 3, 2011.

The findings from the Phase III ESA investigation were reviewed, with PWGSC and the RCMP on September 8, 2011. Based on the findings, it was recommended that four additional test holes, all to be completed as groundwater monitoring wells, be drilled north, northwest and northeast of the impacted area, to achieve closure of the impacted soil and groundwater plumes north of the USTs. This supplemental work was approved by PWGSC and the RCMP in September 2011, and completed by EGE on October 3, 2011.

2.0 FIELD INVESTIGATION

The field program consisted of a general site inspection on the morning of August 2, 2011 followed by a drilling/sampling program later that day and completed the following day, August 3, 2011. The purpose of the site inspection was to review the underground utility locations and finalize the location of the proposed test holes. As outlined earlier, the previous Phase II ESA undertaken by the KGS Group in 2010, report dated April 2011, identified elevated levels of petroleum hydrocarbons in the soil collected from test holes located near the UST and fuel dispensing stand, LNAPL in a well installed in the UST backfill material at the northwest corner of the UST, and elevated levels of petroleum hydrocarbons in the groundwater samples collected from three of the four monitoring wells, all near the UST and fuelling dispensing area.

To further assess and delineate the identified impacts, the Phase III ESA included drilling seventeen test holes (PA-01 through PA-17), of which fifteen were completed as groundwater monitoring wells (PA-01 through PA-14 and PA-17). During completion of the initial subsurface investigation program, EGE also identified a second well installed in the UST backfill material. The well was found adjacent to the southeast corner of the UST and has been referred to as MWSE. The well is similar to MWNW, as identified in the previous Phase II ESA. Four additional test holes (PA-18 through PA-21) were subsequently drilled on October 3, 2011 to achieve closure of the impacted area north of the USTs.

A survey of all of the test hole/monitoring well locations was completed using a Garmin Oregon 300 hand held GPS unit to obtain Universal Transverse Mercator (UTM) coordinates for each point. The coordinates of each test hole/monitoring well are provided in Table 1. A level survey was also undertaken to obtain relative vertical elevations using the top of the concrete slab at the southeast corner of the fuel dispensing stand as the local benchmark, with an assumed datum elevation of 100.000 m.

The test hole locations were partially limited by site access, as well as, the presence of underground and overhead utilities. Specifically, the presence of tubular metal fencing along the east side of the hangar, and underground natural gas, communications, electrical, water and sewer lines entering the site from Airport Road to the south, and leading into the south and east sides of the hangar. The on-site utilities are illustrated on Figure 03. The methodologies employed during the subsurface investigation program are discussed below.

2.1 HEALTH AND SAFETY

EGE is committed to providing a safe and healthy work environment for all workers. Employees at every level, including management, are responsible and held accountable for the company’s overall safety and are committed to doing everything possible to prevent injuries and to maintain a healthy work environment. To this end:

- The company is committed to maintain a workplace health and safety system;
- Every person must integrate good workplace health and safety practices into their daily activities;
- All employees are required to support the workplace health and safety system;
- Managers are responsible for enhancing health and safety consciousness;

- Supervisors must ensure employees are trained in health and safety work procedures to obtain optimal output without incident and injuries; and
- All employees are accountable for implementing the health and safety program.

The safety officer for this project was Mr. Andrew Passalis, P.Eng.

2.2 UTILITY CLEARANCES

Prior to commencing with the intrusive investigation, all site utilities and/or underground service locations and orientations were identified by the appropriate authority through Saskatchewan One Call and a private locator contracted by EGE. The following is a summary of the utilities and authorities that were contacted for clearances.

UTILITY	AUTHORITY/SOURCE OF INFORMATION
Power	SaskPower (Magna Electric Corporation)
Natural Gas	SaskEnergy
Telephone and Fibre Optic	SaskTel (Magna Electric Corporation)
Domestic Water	City of Prince Albert
Sanitary Sewer	City of Prince Albert
Private Locates/Airside	Highline Electric

Utility clearance records provided to EGE are provided in Appendix A.

2.3 REGULATORY APPROVALS

In order to drill the test holes and install the monitoring wells on the RCMP property, and on the adjacent property owned by the City of Prince Albert, that functions as part of the City of Prince Albert Airport, land use approvals were required from Transport Canada and Nav Canada. EGE coordinated these approvals, prior to both site investigations, through Ms. Gayle Sommerfelt, City of Prince Albert Airport Authority. Records of the land use application information submitted by EGE and approval letters from Transport Canada and Nav Canada are provided in Appendix B.

2.4 TEST DRILLING AND SOIL SAMPLING

The test drilling program was initiated on August 2, 2011 and completed on August 3, 2011, followed by a supplemental investigation on October 3, 2011. Drilling was completed using a track-mounted Geoprobe ® 7822 DT drill rig equipped with 82.5 mm “direct push” tooling and 125 mm hollow stem augers. The drill rig was supplied and operated by Intercore Environmental Services Ltd. of Maidstone, Saskatchewan. Continuous soil cores were retrieved using 50 mm diameter PVC liners equipped with dedicated core catchers to obtain relatively undisturbed samples of the underlying soil. Mr. Andrew Passalis of EGE supervised the test drilling activities.

All of the test holes were drilled to a depth of 6.0 m below ground, with the following exceptions: PA-02 and PA-04, which were drilled to a depth of 10.5 m below ground; and PA-15 and PA-16, which were drilled to a depth of 2.25 m below ground. Test holes PA-02 and PA-04 were completed as deeper nested well installations, adjacent to test holes PA-01 and PA-03, respectively. Test holes PA-15 and PA-16 were completed adjacent to the diesel generator, which is located on the east side of the hangar, and were completed as shallow installations to assess the near surface soil quality in this area of the site. Representative photos of the drilling activities are shown below in Photos 15 and 16.

Photo 15 - View looking northeast at PA-04.

Photo 16 - View looking southwest at PA-01/02.

Coring was completed at test holes PA-09 and PA-10, which were located north of the hangar and within the concrete apron, and at test hole PA-11, which was located in the asphalt pavement at the southwest corner of the building. Representative photos of the coring are shown below in Photos 17 and 18.

Photo 17 - Concrete coring at test hole PA-09 located north of the RCMP Hangar.

Photo 18 - Concrete core from test hole PA-10 located north of the RCMP Hangar.

Soil samples were collected, as grab samples, from the core tubes at varying intervals. The samples were pared and placed in plastic bags for field screening of combustible organic vapours, using the headspace method. A portion of the sample was also placed into a clean glass container with minimum headspace and retained for possible laboratory analysis. Disposable nitrile gloves were used during the sample handling. A description of the soils encountered and the location of the grab samples are shown on the test hole logs presented in Appendix C. Test hole locations are shown on Figure 03. A photo of a soil core ready for sampling is provided below in Photo 19.

Photo 19 - Drill core tube extractor equipment and soil core ready for sampling.

The combustible organic vapour survey was carried out using a GasTech Model 1238 ME analyzer. The vapour survey was completed as a guide to identifying zones of petroleum hydrocarbon impacted soil and in selecting samples for laboratory analysis. Measurement was obtained by allowing the samples to volatilize for approximately 20 minutes at a temperature of approximately 20 degrees Celsius. The sample bag was gently agitated for several seconds, punctured and the probe from the GasTech detector inserted into the bag to measure the soil headspace vapour. Combustible organic vapour concentrations, in parts per million (ppm) and/or percent of the lower explosive limit (% LEL), as measured by the headspace method, are profiled on the test hole logs presented in Appendix C. The combustible organic vapour readings are also summarized in Table 2.

Samples retained for possible laboratory analysis were stored on ice packs in a cooler until drop-off at the receiving laboratory. The detailed chain of custody record, as supplied by the receiving laboratory, was completed prior to leaving the project site, placed with the samples and accompanied the shipment to the receiving laboratory. The collected samples were submitted to Maxxam Analytics Inc. (Maxxam) in Saskatoon, Saskatchewan for analysis of the BTEX components and the PHC F1 to F4 Fractions. Select samples were also submitted for analysis of metals, volatile organic compounds (VOCs), glycols, and oil and grease. The samples that were selected for laboratory analysis are highlighted in Table 2.

Three blind duplicate soil samples were also submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. This included samples from test holes PA-08 (labelled BD1) and PA-09 (labelled BD2), both collected during the August 2011 investigation, and from test hole PA-18 (labelled PA-BD1), collected during the October 2011 investigation. All three samples were collected from a depth of 3.67 m below grade. One blind duplicate soil sample was also submitted for analysis of metals, VOCs, oil and grease, and glycols from PA-03/04 at a depth of 3.67 m below ground (labelled BD3). The duplicate samples were collected by splitting the portion of the sample designated for laboratory analysis into two sample containers.

Six soil samples were also submitted from the main stratigraphic units at the site for gradation analysis to confirm the field soil classifications. This included samples from test holes: PA-01/02 at a depth of 8.92 m; PA-05 at a depth of 2.17 m; PA-05 at a depth of 3.67 m; PA-09 at a depth of 5.92 m; PA-13 at a depth of 4.42 m; and PA-19 at a depth of 3.67 m. The results of the gradation analyses are presented in Table 3.

The two test holes that were not completed as groundwater monitoring wells were backfilled with drill cuttings upon completion and sealed with bentonite pellets at the top of each hole. Excess drill cuttings were placed in an environmental soil bag and stored on-site pending receipt of the analytical results. Following completion of the second investigation in October 2011, the excess cuttings were removed by Dmyterko Enterprises on October 4, 2011 and transported to the City of Prince Albert waste disposal ground for placement in the contaminated soil area of the landfill. Prior to transporting the soil to the landfill, EGE submitted an application to the City of Prince Albert requesting approval to dispose of the soils, which included a copy of the analytical results,. The application and landfill tickets from the disposal of the impacted soil cuttings are provided in Appendix D. The quantity of disposed soil also included soil that was still located at the site from either the previous Phase II ESA and/or piping replacement projects.

2.5 GROUNDWATER MONITORING AND SAMPLING

Nineteen new groundwater monitoring wells were installed as part of the current Phase III ESA subsurface investigation program. The new wells were installed to supplement the four existing on-site wells that were installed as part of the previous Phase II ESA program in 2010, report dated April 2011. This included: a nested pair of wells PA-01/02, located east of the UST; a nested pair of wells PA-03/04, located south of the UST area and near the drainage pit on the east side of the hanger; well PA-05, located near the northeast corner of the UST; well PA-06, located southeast of the UST, near the fence; well PA-07, located northeast of the UST; well PA-08, located north of the UST; well PA-09, located northwest of the UST along the north edge of the concrete apron; well PA-10, located southwest of the UST near the hangar overhead door; well PA-11, located at the southwest corner of the hangar; well PA-12, located east of the diesel generator; well PA-13, located south of the shed; well PA-14, located east of the shed; wells PA-17 and PA-18, located northeast of the UST; well PA-19, located northeast of the UST and north of Taxiway Bravo; well PA-20, located northwest of the UST and north of Taxiway Bravo; and well PA-21, located north of the UST and Taxiway Bravo.

Monitoring well construction consisted of 51 mm diameter PVC pipe with threaded internal/external flush mount joints and a PVC screen section, except at the two deep wells, which formed part of the nested pair of wells. The two deep wells were both installed with 38 mm diameter PVC pipe. The wells were completed at the base with an end cap and at surface with a threaded male/female adaptor. No glued joints were used. The annular space around the screen interval was backfilled with silica sand. The remaining annulus was backfilled to ground surface with bentonite pellets. All of the wells were completed at grade with flush mount protective casings.

The majority of the wells were screened across the water bearing sand unit and were installed to a depth of 6.0 m. The exceptions were the two deep wells, PA-02 and PA-04, which were installed to a depth of 10.5 m. The deeper wells were screened from approximately 8.8 to 10.3 m below grade, which is entirely within the more impervious silt and clay unit that underlies the water bearing sand. All of the groundwater monitoring well locations are highlighted on Figure 03. Construction details are provided on the individual test hole logs presented in Appendix C.

The fifteen wells installed during the initial Phase III ESA investigation, the four wells installed during the previous Phase II ESA and the two wells previously installed in the UST backfill were: monitored for combustible organic vapours, water level and LNAPL; purged with a portable purge pump; monitored for general field chemistry; and then sampled. The exception were those wells that contained LNAPL (PA-01, PA-03, PA-05, PA-08, MW2, MW3, MWNW and MWSE). The initial monitoring and sampling activities were undertaken on August 4, 2011, following completion of the drilling program on August 3 and 4, 2011, and were re-monitored on August 24, 2011, during a return trip to site. The four supplemental wells, PA-18 through PA-21, were monitored and sampled on October 4, 2011, following completion of the drilling activities on October 3, 2011. The previous well installations were also re-monitored on this date.

Combustible organic vapour levels were monitored at each well using a GasTech Model 1238ME Analyzer. The analyzer was calibrated to a hexane standard prior to transport to the project job site. In each case the cover plate of the protective casing was removed to gain access to the monitoring well. The well cap was then loosened with a wrench, the cap removed and the organic vapour level measured by inserting the end of the probe from the analyzer into the well and recording the vapour reading in ppm or % LEL. Measurements were taken with the methane elimination switch in the on position. The reading was subsequently recorded in a data field book and the probe removed from the well. The instrument was then allowed to recover to ambient background conditions prior to moving to the next well location.

Field parameters, including temperature, specific conductance, dissolved oxygen, pH, total dissolved solids and redox potential, were monitored using a YSI 556 Multi Probe meter. Turbidity was also measured in the field using a Hanna Instruments HI 98703 Turbidimeter. The field parameters were measured using the purge water collected at each well. All values were recorded in a data field book and the YSI 556 Multi Probe and turbidity sample vials disinfected with a distilled water rinse followed each test. The exceptions were the two deeper wells, PA-02 and PA-04, which had insufficient purge water to monitor the field chemistry. These two points were only sampled for the specific contaminants of concern.

LNAPL and water level monitoring were completed using a Heron Model H.01L Interface Probe. The end of the probe is lowered into the well and emits a continuous audible signal if it comes into contact with LNAPL. The depth is recorded from the calibrated wire attached to the probe using the top of the well casing as the reference datum. The probe will emit an intermittent signal when it comes into contact with water and the LNAPL thickness, if present, is calculated by subtracting the two measurements. As the depth to LNAPL (if present) and the depth to water were detected, the measurements were subsequently recorded in a data field book, and the probe removed from the well. To reduce the potential for cross contamination the probe was disinfected between each well using an Alconox soap wash and distilled water rinse.

The combustible organic vapour, water level and LNAPL monitoring results are summarized in Table 4. The field chemistry results are summarized in Table 5. Representative photos of the LNAPL encountered within the wells are provided below in Photos 20 through 22.

Photos 20 and 21 - LNAPL removed from monitoring wells by bailer.

Photo 22 - Disposal of LNAPL into pail for transfer and storage in an on-site 220 litre drum.

Water sampling was completed using dedicated disposable bailers. Prior to handling the sampling equipment and sample containers, a new pair of nitrile gloves were worn at each of the sampling locations. The groundwater samples were collected using dedicated disposable bailers, which were slowly lowered into each well using dedicated twine attached to the top of the bailer. Once in contact with the formation water the bailers were allowed to fill and then carefully pulled back up out of the well, and discharged directly into the specified sample containers, as prescribed by the receiving laboratory.

The sample bottles were filled to the levels specified by the laboratory, immediately capped and then labelled, noting all of the pertinent information using a permanent waterproof ink marker. All sample bottles were properly identified, with a unique sample number, and the date and time of sampling. The sample containers were then carefully packed into a cooler, with ice packs, to ensure the samples remained cold. The date and time the samples were collected were also noted in the data field book, along with the well number and any other relevant observations made during the sampling process.

The collected samples were stored on ice packs in a cooler until drop-off at the receiving laboratory. The detailed chain of custody record, as supplied by the laboratory, was completed prior to leaving the project site, placed with the samples and accompanied the shipment to the receiving laboratory. All of the collected samples were submitted to Maxxam Analytics Inc. in Saskatoon, Saskatchewan for the analysis of the BTEX components and the PHC F1 to F4 Fractions. Three points were also selected for metal, glycol, and oil and grease analyses, and two points were selected for VOC analysis. Samples were delivered directly to the receiving laboratory upon completion of the field program to ensure that the holding times were not exceeded prior to analysis.

Three blind duplicate groundwater samples were also submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. This included samples from: well PA-04 (labelled BDW1); well PA-07 (labelled BDW2); and well PA-19 (labelled PA-BDW2). Sample BDW1 was also submitted for analysis of metals, VOCs, glycols, and oil and grease. The duplicate sample containers were filled in a similar manner, as described above, following collection of the initial water sample. One field blank (labelled PA-FB) was prepared in the field using distilled water, and was submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. One travel blank (labelled PA-TB) was prepared by the analytical laboratory, traveled with the sample containers at all times, and was submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions.

2.6 IN-SITU HYDAULIC CONDUCTIVITY TESTING

In-situ hydraulic conductivity testing was completed at one of the new deeper nested monitoring wells, PA-04, to supplement the hydraulic conductivity testing completed during the Phase II ESA. The in-situ hydraulic conductivity testing was completed using a bail down test that involved withdrawing water from the well, with the aid of a bailer, and then recording the rate of recovery. The depth to groundwater was recorded using a water level meter with an accuracy of +/- 1 mm. The data was analyzed with the aid of a computer program that uses analytical solutions to solve for aquifer properties. The water level recovery data was plotted against time and matched to the Bower-Rice Slug Test Solution (1976) for an unconfined aquifer. The hydraulic conductivity plot is presented in Appendix E.

3.0 PHYSICAL CHARACTERISTICS OF THE SITE

3.1 REGIONAL GEOLOGY

Information on the regional geology of the Prince Albert area indicates that the region is underlain by Phanerozoic eon Mesozoic era Cretaceous period claystone-siltstone, mudstone plus siltstone and shale plus mudstone of the Upper Colorado group. The surficial deposits are between 50 and 100 m thick and overlie Pleistocene aged moraine deposits, consisting of till and minor amounts of water sorted material, with local bedrock exposures and areas of undifferentiated sub-glacially molded deposits with streamlined features.

The topography is flat to undulating and reflects the topography of the underlying bedrock (10). Bedrock in the area consists of the Willow Creek Formation, which contains Paleocene and Upper Cretaceous aged pale grey, fine grained calcareous sandstone or thick bedded and coarse grained grey green and pink bentonitic mudstone with thin limestone inter-beds (11).

3.2 LOCAL GEOLOGY

The soil stratigraphy beneath the investigated area at the RCMP Hangar, generally consists of a layer of fine grained silt above a coarse grained sand that overlies fine grained clay and silt layers, which extends to the maximum depth of investigation (10.5 m below ground surface). A brief discussion of the key stratigraphic units follows. Detailed soil descriptions are also provided on the individual test hole logs presented in Appendix C. The locations of the test holes are shown on Figure 03.

Asphalt/Concrete

A 0.075 m thick layer of asphalt was encountered at surface at test hole PA-11 located at the southwest corner of the hangar. A 0.20 to 0.25 m thick layer of concrete was encountered at surface at test holes PA-10 and PA-09, respectively, both of which were located within the concrete apron directly north of the hangar.

Sand and/or Gravel and Silt (Fill)

A 0.3 to 0.6 m thick layer of sand and gravel fill was encountered beneath the asphalt pavement at test hole PA-11, and beneath the concrete slab at test holes PA-09 and PA-10, and at surface at test hole PA-19. The sand and gravel fill was generally brown, well graded, contained some fines, was damp, and dense. A 2.4 m thick layer of sand fill was encountered at surface at test holes PA-01/02 and a 0.3 m thick layer was encountered at test hole PA-20. The sand fill was brown, fine grained, poorly graded, contained trace gravel, some silt and was dry to damp. A 1.3 m thick layer of sandy silt fill was encountered at surface at test holes PA-03/04. The silt fill was brown, very fine grained, damp and soft.

There were no odors or staining noted in the fill layers and the combustible organic vapour readings, where measured, ranged from 5 to 15 ppm, which are reflective of background concentrations. The one exception was at the base of the fill at test holes PA-01/02, where an elevated reading of 175 ppm was recorded.

Silt

A 0.4 to 2.3 m thick layer of silt was encountered at surface or below the surficial fill at all of the test hole locations except for the two nested pairs PA-01/02 and PA-03/04, and test hole PA-09. The silt was brown, contained some fine grained sand, was dry to damp and firm. Trace organics and/or rootlets were noted at test holes PA-05, PA-07, PA-08, PA-13, PA-14, PA-16 and PA-17. No odours or staining were noted in this unit and the combustible organic vapour readings ranged from 5 to 30 ppm, which are reflective of background concentrations.

Sand

A 1.7 to 4.1 m thick layer of sand was encountered directly beneath the fill or silt units at all of the test hole locations. The sand was brown and very fine to fine grained near surface, with trace silt, trending towards grey and medium grained at depth. At the bottom of the sand unit, trace to some gravel was also observed. Above the water table, the sand was damp and loose. There were noticeable odors in the sand detected at test holes PA-01/02, PA-03/04, PA-05, PA-07, PA-13, and PA-18. A sheen was also observed in the sand at test holes PA-03/04, PA-05 and PA-08. The sheen was observed between 3.0 and 4.0 m below ground.

Combustible organic vapour readings above 5% LEL were noted in the deeper samples of the sand at test holes PA-01/02, PA-03/04, PA-05, PA-07, PA-08, PA-13 and PA-18. Values ranged from 6% LEL at test hole PA-13 to 32% LEL at test holes PA-01/02. At depths above 3.0 m, the combustible organic vapour readings in the sand were all below 50 ppm, reflective of background conditions. This was also the case for the deeper samples of the sand at the test holes that did not have elevated vapour readings in the % LEL range. The two exceptions include test hole PA-09, which had an elevated reading of 100 ppm at a depth of 3.67 m, and test hole PA-18, which had an elevated reading of 230 ppm at a depth of 2.92 m.

Grain size analyses were run on three samples from the sand unit. This included samples from test hole PA-05 at depths of 2.17 and 3.67 m below ground, and test hole PA-19 at a depth of 3.67 m below ground. At test hole PA-19, there was 98% of the sample retained on the #200 (0.075 mm) sieve, while at test hole PA-05, there was 84% was retained in the shallower sample and 93% retained in the deeper sample. All of these results indicate a coarse grained soil classification for the sand unit found at the site.

Clay and Silt Layers

Inter-bedded layers of clay and silt were encountered below the sand unit at all of the test hole locations. At test holes PA-01/02, PA-05, PA-06, PA-08, PA-09, PA-10, PA-11, PA-13, PA-14 and PA-20, a clay layer was encountered immediately below the sand, while at test holes PA-03/04, PA-07, PA-12, PA-17, PA-18, PA-19, and PA-21, a silt layer was observed immediately below the sand.

The clay layer was generally brown to grey, contained trace to some silt, was damp and firm to stiff, with a low plasticity. However, the plasticity increased to medium to high at depth in several of the test holes. The silt was generally brown to grey, contained trace to some clay and trace to some very fine to fine sand, was damp to wet, and firm to stiff.

There was no evidence of staining in the silt or clay units, however, a slight hydrocarbon odor was noted: at test hole PA-01/02 in the clay layer between a depth of 4.5 and 5.0 m; at test hole PA-05 in the clay layer between a depth of 4.0 and 5.0 m; at test hole PA-08 in the clay layer between a depth of 4.3 and 4.6 m; and at test hole PA-13 in the clay and silt layers between a depth of 4.5 and 5.0 m.

Combustible organic vapour readings in the clay layers were at or below 85 ppm, reflective of background concentrations, except at: test holes PA-01/02, where combustible organic vapour readings of between 260 and 300 ppm were noted from 8.92 to 10.5 m below ground; at test hole PA-05, where a reading of 475 ppm was noted at a depth of 4.42 m below ground; at test hole PA-13, where a reading of 225 ppm was noted at a depth of 4.42 m below ground; and at test hole PA-18, where a reading of 125 ppm was noted at a depth of 5.17 m below ground.

The combustible organic vapour readings in the silt layers were at or below 35 ppm, reflective of background conditions, except at: test holes PA-01/02, where a reading of 215 ppm was noted at a depth of 5.17 m below ground; at test hole PA-03/04, where a reading of 165 ppm was noted at a depth of 10.42 m below ground; and at test hole PA-18, where a reading of 120 ppm was noted at a depth of 4.42 m below ground.

Grain size analyses were run on three samples from the silt and clay layers. This included: a sample from the clay at test holes PA-01/02 at a depth of 8.92 m below ground; a sample of the silt at test hole PA-09 at a depth of 5.92 m below ground; and a sample of the clay at test hole PA-13 at a depth of 4.42 m below ground. At test holes PA-01/02 and PA-09, there was 95% passing the #200 (0.075 mm) sieve, while at test hole PA-13, there was 99% passing. All of these results indicate a fine grained soil classification for the silt and clay layers found at the site.

3.3 TOPOGRAPHY

The topography of the Prince Albert area is undulating to hummocky, with a regional slope to the North Saskatchewan River valley. At the subject property, this is towards the southwest.

The local topography at the site is relatively flat and is situated at an elevation of approximately 429 m above sea level (asl). Surface runoff is directed radially away from the hangar to the surrounding landscaped and paved areas, and then towards a drainage ditch located along Airport Road to the south. Runoff at the north side of the property appears to be directed north towards the airport lands.

3.4 HYDROLOGY

The nearest surface water body to the RCMP Hangar is the North Saskatchewan River, located 430 m to the southwest. The North Saskatchewan River flows northwest and joins the South Saskatchewan River, which flows into Manitoba. Spruce River is located about 3 km north of the site and flows into the North Saskatchewan River. Coubeaux Lake is located about 3.3 km to the northwest. A large number of small depressional ponds are also located south and southeast of the North Saskatchewan River, starting about 2 km south of the site.

Plate 04 below, shows the location of the prominent surface water features near the RCMP Hangar.

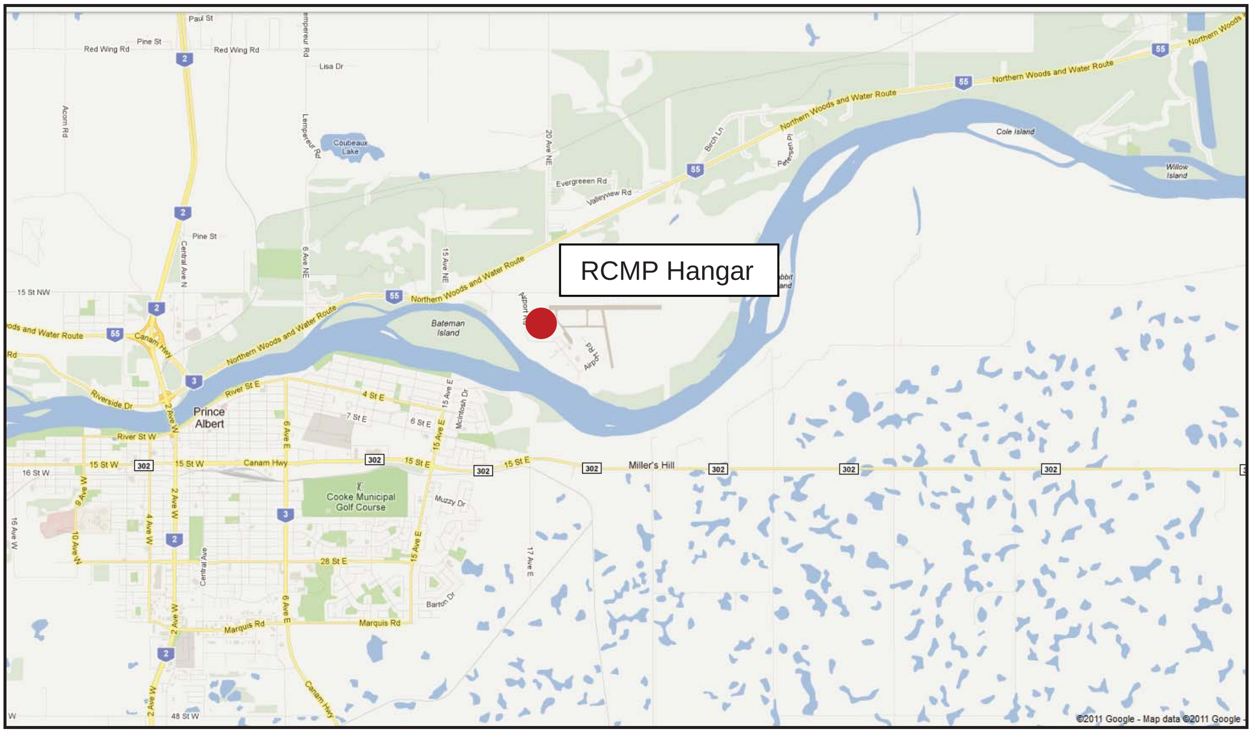

Plate 04 - Map showing the surface water bodies near the RCMP Hangar (Google Maps, 2011).

3.5 HYDROGEOLOGY

The general direction of groundwater flow in the area is assumed to follow the local topography. On this basis the groundwater flow direction at the RCMP Hangar site would be to the southwest towards the North Saskatchewan River valley.

A search of groundwater well records identified four wells within the northeast quarter of Section 11, Township 49, Range 26 W2M, which is the same quarter section as the RCMP Hangar. Two additional wells were noted in the adjacent quarter section to the northeast (SW ¼ 13-49-26) and two additional wells were noted in the adjacent quarter section to the south (NE ¼ 24-48-26). There were no wells listed in the remaining six adjacent quarter sections.

One of the four wells drilled in the NE ¼ of 11-49-26 is listed as a municipal well owned by the City of Prince Albert. The location of this well is shown by the red circle on Plate 05 below. The well is 13.7 m deep and has a recommended pumping rate of 409 litres per minute and a static water level of 7.6 m below ground. The lithology at this location is noted to be sandy clay from 0 to 0.6 m below ground, followed by sand to 4.3 m, and sand and gravel to 13.7 m. The well was drilled in 1940. The three remaining wells in this quarter section are private wells, with two wells listed to one property owner (the two records are for the same well, the second record was issued to correct the lithology listed in the first record). These wells range in depth from 9.8 to 17.4 m below ground and are also screened within the deeper water bearing granular deposits. The well locations are highlighted on Plate 05 below by the orange circle, containing the number three. There were no wells listed for the RCMP Hangar property.

The two wells in the SW ¼ of 13-49-26 are for a private residence and a church, while the two wells in the NE ¼ of 24-48-26 are for one private residence. These well locations are highlighted on Plate 05 below by the two remaining orange circles, containing the number two, which are situated within the square box defining the limit of the adjacent quarter sections. Copies of the eight individual well records are also provided in Appendix F.

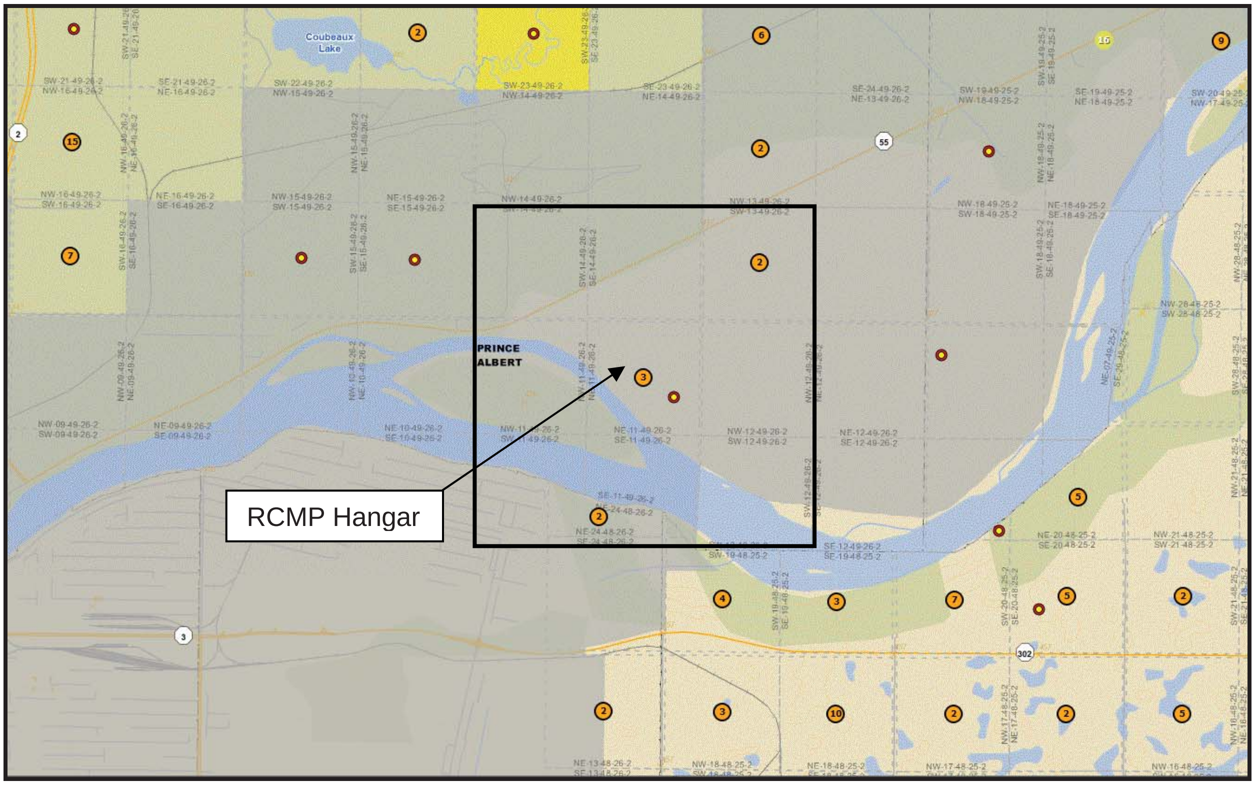

Plate 05 - Map showing the location of the nearest potable groundwater wells to the RCMP Hangar (Saskatchewan Watershed Authority, 2011). Outlined area highlights the RCMP Hanger property and nine adjacent quarter sections.

Information obtained from the City of Prince Albert internet page (12) indicates that potable water for the city is drawn from the North Saskatchewan River, approximately 4.8 km upstream of the city. The water treatment plant is located at the southwest corner of 6th Avenue West and River Street West. The internet page also references that about 600 rural area farms are serviced by treated water from the water treatment plant through the municipal piped water distribution system.

The City of Prince Albert Airport Authority representative indicated that all airport properties are serviced by piped municipal water and that the 1940 well is likely associated with the airport when it was constructed by the Department of National Defence, as a flying training school under the British Commonwealth Air Training Program. The representative also reported that the well is still located at the airport, however, is reportedly dry (See Appendix F - electronic e-mail, dated November 28, 2011). On this basis, it is unlikely that the eight identified wells in the immediate area of the RCMP Hangar are currently being used for potable water, however, without contacting the individual users, groundwater use within the region cannot be entirely excluded.

The fifteen new wells, PA-01 through PA-14 and PA-17, which were installed on August 2 and 3, 2011, and the six existing on-site wells, MW1 through MW4, MWNW and MWSE, were monitored for water levels on August 4 and 24, 2011. The four additional wells, PA-18 through PA-21, which were installed during the supplemental investigation on October 3, 2011, were monitored on October 4, 2011, along with the twenty-one other points. The well locations are highlighted on Figure 03. Well construction details, including northing/easting, collar elevation, ground elevation, stick-up and screened interval are summarized in Table 4, along with the results of the water level monitoring. The elevations are referenced to the top of the concrete slab at the southeast corner of the fuel dispensing stand, which was assigned a datum elevation of 100.000 m.

Based on the October 4, 2011 water level measurements, as shown in Table 4, the calculated piezometric elevations ranged from 96.144 m at PA-08 northeast of the UST to 96.607 m at MW4 at the northwest corner of the hangar. The calculated piezometric elevations and interpreted groundwater flow direction are shown on Figure 04, and indicate flow is to the north and northeast at a gradient of 0.02 to 0.05 m/m. The interpretation excluded the two wells installed within the UST backfill materials, MWNW and MWSE, and the piezometric elevations were adjusted upward to include the LNAPL thickness, where present. The interpreted groundwater flow shown on Figure 04 is generally consistent with the findings from the Phase II ESA. The vertical gradient, based on the water level measurements recorded at the two nested well pairs, PA-01/02 and PA-03/04, appears to be upward at 0.014 to 0.032 m/m.

In-situ hydraulic conductivity testing was completed at well PA-04, the deeper of the nested well pair at this location. This well is screened entirely within the fine grained material found below the upper sand unit. A bail down test was completed, and the recovery data was plotted against time and matched to the Bower-Rice Slug Test Solution (1976) for an unconfined aquifer. The data plot from the in-situ hydraulic conductivity test is presented in Appendix E and the estimated hydraulic conductivity for this fine grained soil was calculated to be 4.1×10^{-07} m/s. The Phase II ESA previously reported a hydraulic conductivity of 3.9×10^{-05} m/s for the sand unit at well MW2. An in-situ rising head test was conducted and the data inputted into a computer modelling program, AQTESOLV, to estimate the conductivity. This is the unit in which the LNAPL, impacted soil and impacted groundwater are present. The above values are consistent with the coarse and fine grained materials encountered on-site.

4.0 ANALYTICAL PROGRAM

4.1 POTENTIAL CONTAMINANTS OF CONCERN

As outlined in Section 1.0, the previous Phase II ESA undertaken by the KGS Group in 2010, report dated April 2011, identified elevated levels of petroleum hydrocarbons in the soil and groundwater collected from test holes and monitoring wells located near the current and former USTs northeast of the hangar building. Consequently, petroleum hydrocarbons were considered to be the primary contaminants of concern with respect to human health or ecological risk at the site. Based on a review of the Phase I ESA, EGE also identified metals, VOCs, glycols, and oil and grease, as secondary contaminants of concern at two areas of the site. One near the unlined drainage pit east of the hangar, and one near the southwest corner of the hangar close to the location of the interior waste oil storage tank and sump pit in the chemical room.

4.2 LABORATORY ANALYSIS

Thirty-two soil and sixteen groundwater samples were submitted for laboratory analysis of petroleum hydrocarbons. The submitted soil samples were selected based on the headspace concentration of combustible organic vapours in air, as measured by the GasTech Model 1238 ME analyzer, and on visual and olfactory evidence, as noted during the test drilling program. Each of the submitted soil and groundwater samples were analyzed for benzene, toluene, ethylbenzene and xylenes (the BTEX parameters), and the four fraction analysis of petroleum hydrocarbons (PHC F1 to F4 Fractions). In addition, three soil and three groundwater samples were submitted for metals, glycol, and oil and grease analysis, and three soil and two groundwater samples were submitted for VOC analysis. Six soil samples were also submitted for grain size analysis and four samples of LNAPL were submitted for analysis of the BTEX parameters and the PHC F1 to F4 Fractions.

The soil and groundwater samples were submitted for analysis to Maxxam Analytics Inc. in Saskatoon, Saskatchewan. Maxxam has been accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) and participates in extensive inter-laboratory comparison programs. Copies of the analytical reports are presented in Appendix G.

4.3 QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM

Prior to and throughout the field program communication with the laboratory was maintained to ensure that all QA/QC objectives, such as detection limits, proper sample containers and sample holding times, were being met. In order to acquire high quality data and to reduce the potential for cross contamination between samples, all samples were also collected, transported and stored under conditions that maintained sample integrity using the general protocols presented in the *Canadian Council of Ministers of the Environment - Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites* [13].

Pre-cleaned sample containers were provided by the laboratory. Each well was purged prior to sampling to ensure fresh formation water was collected. Monitoring equipment was decontaminated between sampling stations and dedicated sampling systems were utilized. Disposable gloves were worn during handling of all sampling equipment and containers. The samples were stored on ice packs in coolers pending transport to the laboratory and proper chain of custody was followed throughout the sample handling.

Maxxam Analytics Inc. also applies internal QA/QC protocols, including: using standard operating procedures; adhering to principles of good laboratory practice; and using standardized approved scientific methodologies. Maxxam's QA/QC program includes laboratory duplicates, method blanks and matrix spikes. Details of the internal QA/QC procedures and methodologies employed by Maxxam are presented in the laboratory reports provided in Appendix G.

In addition to Maxxam's internal QA/QC program, three blind duplicate soil samples were submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. This included samples from test holes PA-08 (labelled BD1) and PA-09 (labelled BD2), both collected during the August 2011 investigation, and from test hole PA-18 (labelled PA-BD1), collected during the October 2011 investigation. All three samples were collected from a depth of 3.67 m below grade. One blind duplicate soil sample was also submitted for analysis of metals, VOCs, oil and grease, and glycols from PA-03/04 at a depth of 3.67 m below ground (labelled BD3). The duplicate samples were collected by splitting the portion of the sample designated for laboratory analysis into two sample containers.

Three blind duplicate groundwater samples were also submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. This included samples from: well PA-04 (labelled BDW1); well PA-07 (labelled BDW2); and well PA-19 (labelled PA-BDW2). Sample BDW1 was also submitted for analysis of metals, VOCs, glycols, and oil and grease. The duplicate sample containers were filled in a similar manner, as described above, following collection of the initial water sample. One field blank (labelled PA-FB) was prepared in the field using distilled water, and was submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. One travel blank (labelled PA-TB) was prepared by the analytical laboratory, traveled with the sample containers at all times, and was submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. The QA/QC samples were submitted as an independent check on data reproducibility and the field QA/QC protocols.

5.0 DISCUSSION OF ANALYTICAL RESULTS

5.1 ASSESSMENT CRITERIA

The Federal Government currently reference the environmental assessment guidelines outlined in the following Canadian Council of Ministers of the Environment (CCME), Health Canada (HC) and Federal Contaminated Sites Action Plan (FCSAP) documents:

- CCME Canadian Environmental Quality Guidelines (CEQG) (14);
- CCME Canada Wide Standard (CWS) for Petroleum Hydrocarbons in Soil (15);
- HC Guidelines for Canadian Drinking Water Quality (16); and
- FCSAP Guidance Document on Federal Interim Groundwater Quality Guidelines (FIGQG) for Federal Contaminated Sites (17).

Using the above documents, an assessment of the site was completed, including an evaluation of the applicable exposure pathways, land uses, key receptors and an evaluation of the predominant soil texture at the site. The assessment was conducted in accordance with current CCME guidelines and did not include the modification or recalculation of the formulas used to derive the default guideline values. The assessment is based on the following rationale:

- Land use - the site is considered a commercial property and is expected to remain commercial, therefore, the commercial land use criteria have been selected;
- Surface soil (< 1.5 m below ground) - based on the field soil classification, with the exception of the areas of granular fill, the surface soils are typically fine grained;
- Subsoil (> 1.5 m below ground) - grain size analysis, as shown in Table 3, confirms the field classification that the subsoil (below a depth of 1.5 m) is coarse grained sand followed by fine grained silt and/or clay;
- Benzene incremental risk factor - the 10^{-6} incremental risk factor has been selected for use at this site (see discussion regarding a sensitivity analysis below);
- Soil ingestion pathway - the surface and subsurface soils are potentially accessible to workers, undertaking construction in and around any affected areas, therefore, soil ingestion is a valid pathway;
- Soil dermal contact pathway - for the same reason as soil ingestion, soil dermal contact is also a valid pathway;
- Soil vapour inhalation - for the same reason as soil ingestion, soil vapour inhalation is also a valid pathway;
- Inhalation of indoor air pathways - the hangar has a concrete slab on grade foundation, therefore, the inhalation of indoor air (slab on grade) pathway is valid, however, as there is no basement, the inhalation of indoor air (basement) pathway has been excluded;
- Off-site migration check - the potential exists for off-site migration of contaminants, therefore, the off-site migration check is valid;

- Potable groundwater (drinking water) pathway - the RCMP and adjacent properties are serviced by municipal treated water from a piped distribution system, therefore, the potable groundwater pathway has been excluded;
- Produce, meat and milk pathway - there is no information available to indicate that produce, meat or milk is grown or raised near the site, therefore, this pathway has been excluded;
- Ecological soil contact - vegetation is present on the site and the area is accessible to wildlife, therefore, the ecological soil contact pathway is valid;
- Soil and food ingestion pathway - there is no information to suggest garden produce is grown near the site, therefore, this pathway has been excluded;
- Nutrient and energy cycling pathway - there is no agricultural development in the area, therefore, this pathway has been excluded;
- Livestock (groundwater interaction) pathway - there is no information to suggest livestock are raised near the site, therefore, this pathway has been excluded;
- Aquatic life (groundwater interaction) pathway - the distance to the nearest surface water is approximately 430 m in a southwest direction from the site to the North Saskatchewan River, however, the local shallow groundwater flow direction, as confirmed by on-site testing during the Phase II and III ESAs, is in the opposite direction, towards the north and northeast, where the closest surface water that could support aquatic life is more than 3 km away, therefore, the protection of aquatic life pathway has been excluded; and
- Management limit pathway - this pathway is used in the absence of other applicable pathways, therefore, it is a valid pathway.

Based on the above rationale, the following risk management guidelines have been selected as the lowest numerical value from the list of applicable pathways identified above:

- CCME generic commercial CEQG values for the BTEX parameters for fine grained surface soil, and fine and coarse grained subsoil. As outlined in the HC document Federal Contaminated Site Risk Assessment in Canada, Part I, Guidance on Human Health Preliminary Quantitative Risk Assessment [(18)], an incremental risk factor of 10^{-5} is recommended for use on Federal properties. However, a sensitivity analysis indicates that using the 10^{-6} incremental risk criteria does not result in classifying any soil as being impacted that is not already impacted by another BTEX or PHC parameter. On this basis, and considering that the RCMP property is leased land and that the soil impacts extend beyond the RCMP property onto the adjacent City of Prince Albert airport property, the 10^{-6} incremental risk factor for benzene was selected as a more conservative value. The selected limiting exposure pathways are:

    - Benzene - fine grained surface soil, and fine and coarse grained subsoil - inhalation of indoor air (slab on grade);
    - Toluene and Ethylbenzene - fine grained surface soil, and fine and coarse grained subsoil - ecological soil contact;
    - Xylenes - fine grained surface soil and subsoil - ecological soil contact; and
    - Xylenes - coarse grained subsoil - inhalation of indoor air (slab on grade).

- CCME generic commercial CWS PHC values for the volatile petroleum hydrocarbons and extractable petroleum hydrocarbons in the F1 to F4 ranges. The selected limiting exposure pathways are:

  - F1 to F4 Fractions - fine grained surface soil - ecological soil contact; and
  - F1 to F4 Fractions - fine and coarse grained subsoil - management limits.

- CCME generic commercial CEQG values for the metal parameters (there are no distinctions between surface soil and subsoil). Both the human health and environmental exposure pathway check values are cited;

- CCME generic commercial CEQG values for the VOC parameters (there are no distinctions between surface soil and subsoil); and

- CCME generic commercial CEQG values for the glycol, and oil and grease parameters (there are no distinctions between surface soil and subsoil). Both the human health and environmental exposure pathway check values are cited for the glycol parameters. There is no oil and grease guideline value.

The following assessment criteria have been selected for the groundwater samples:

- FCSAP - Federal Interim Groundwater Quality Guidelines (FIGQG) - Generic Guidelines for Commercial and Industrial Land Uses - Tier 2 - Coarse Grained Soil for the BTEX parameters, and the PHC F1 and F2 Fractions only (Table 3). The limiting exposure pathways are:

  - Benzene, Xylenes and the PHC F1 Fraction - coarse grained soil - inhalation;
  - Toluene, Ethylbenzene and the PHC F2 Fraction - coarse grained soil - soil organisms direct contact;
  - PHC F3 and F4 Fractions - no guidelines;
  - Metals - no applicable guidelines;
  - VOCs - coarse grained soil - inhalation;
  - Glycols - coarse grained soil - soil organisms direct contact; and
  - Oil and Grease - no guideline.

- Health Canada - Guidelines for Canadian Drinking Water Quality (HC-GCDWQ) for the BTEX, metal, VOC and glycol parameters. The HC-GCDWQ are shown for reference purposes, as the drinking water pathway has been excluded for the site.

The results of the BTEX and PHC analyses in soil, and groundwater, are summarized in Tables 6 and 11, respectively, along with the applicable assessment criteria. The results of the metal analyses in soil, and groundwater, are summarized in Tables 7 and 12, respectively. The results of the VOC analyses in soil, and groundwater, are summarized in Tables 8 and 13, respectively. The results of the glycol and oil/grease analyses in soil, and groundwater, are summarized in Tables 9 and 14, respectively. Copies of the laboratory reports are presented in Appendix G.

5.2 SOIL RESULTS

As part of the previous Phase II ESA undertaken by the KGS Group in October 2010, report dated April 2011, eight test holes were drilled around the location of the existing and former USTs in order to confirm the presence/absence of impacted soil. Eight soil samples, one from each test hole, were subsequently submitted for laboratory analysis of the BTEX parameters and the PHC F1 to F4 Fractions. Four of the eight soil samples, including samples from test holes TH2 (MW2), TH3 (MW3), TH5 and TH6, exceeded the selected CCME CEQG and CWS criteria for one or more of the BTEX components, and the PHC F1 and F2 Fractions, respectively.

Vertical delineation of the impacted soil was not obtained, as there were no samples submitted from below the impacted sand layer. Horizontal delineation was also incomplete to the north and east. Therefore, the volume of impacted soil was not determined. The exceeded samples were from within the sand layer at a depth of between 3.0 and 4.0 m below grade, and were located northeast, east and southeast of the USTs. There were no exceeded values from the test holes located to the south and west. The previous Phase II ESA analytical results are included in Table 6, for reference.

As part of the Phase III ESA, twenty-one test holes were drilled on the RCMP site, and to the east and north on the adjacent City of Prince Albert Airport property. The primary purpose of the Phase III ESA program was to obtain horizontal and vertical delineation of the impacted soil based on the results of the Phase II ESA. The results from the Phase III ESA soils investigation are summarized below.

5.2.1 Combustible Organic Vapours

Field screening of combustible organic vapours was completed using a GasTech Model 1238 ME analyzer, as discussed in Section 2.3. The vapour readings were used as a guide to identifying zones of petroleum hydrocarbon impacted soil and in selecting samples for possible laboratory analysis. The combustible organic vapour concentrations in ppm, as measured by the headspace method, are profiled on the individual test hole logs presented in Appendix C and are also summarized in Table 2.

As illustrated in Table 2, and similar to the findings of the previous Phase II ESA, the majority of the combustible organic vapour readings were below 50 ppm and reflect background concentrations. There were a select number of samples with slightly to moderately elevated readings that were between 50 and 500 ppm. These samples were typically from above and/or below the identified zones of soil impact, and from the test holes located around the margins of the more highly impacted test hole locations.

Within the area of the former and active USTs, highly elevated readings (greater than 500 ppm) were noted at the following test hole locations:

- PA-01/02 - 32% LEL at a depth of 3.67 m and 5% LEL at a depth of 5.17 m;
- PA-03/04 - 24% LEL at a depth of 3.67 m;
- PA-05 - 29% LEL at a depth of 3.67 m;
- PA-07 - 19% LEL at a depth of 3.67 m;
- PA-08 - 22% LEL at a depth of 3.67 m;

- PA-13 - 6% LEL at a depth of 3.67 m; and
- PA-18 - 8% LEL at a depth of 3.67 m.

In all cases, the combustible organic vapour readings in the samples from above these zones were near background levels or slightly to moderately elevated, and vapour readings returned to background levels below these zones. In all cases, the highly elevated vapour readings were within the layer of sand that is located below the fine grained surface soil, and above the underlying fine grained silts and clays.

5.2.2 Petroleum Hydrocarbons

Thirty-two soil samples were submitted for laboratory analysis of petroleum hydrocarbons (the BTEX components and the PHC F1 to F4 Fractions). The samples were generally chosen based on analyzing the samples with the highest combustible organic vapour reading at each of the test hole locations. This included: all of the samples with the highly elevated vapour readings and presence of hydrocarbon odors; and select background samples from above and below these zones, and from the margins of the impacted test hole locations. The results are summarized in Table 6, along with the previous analytical results from the Phase II ESA. As shown in Table 6, the following test holes reported values that were above the selected CCME CEQG and CWS values:

- PA-01/02 at a depth of 3.67 m for benzene, and the PHC F1 and F2 Fractions;
- PA-03/04 at a depth of 3.67 m for the PHC F2 Fraction;
- PA-05 at a depth of 3.67 m for benzene, and the PHC F1 and F2 Fractions;
- PA-07 at a depth of 3.67 m for the PHC F2 Fraction;
- PA-08 at a depth of 3.67 m for benzene, and the PHC F1 and F2 Fractions;
- PA-18 at a depth of 3.67 m for benzene, and the PHC F1 and F2 Fractions;
- TH2 (MW2) at a depth of 3.30 m for benzene and the PHC F2 Fraction;
- TH3 (MW3) at a depth of 4.25 m for benzene, and the PHC F1 and F2 Fractions;
- TH5 at a depth of 3.30 m for benzene, xylenes, and the PHC F1 and F2 Fractions; and
- TH6 at a depth of 3.95 m for benzene, and the PHC F1 and F2 Fractions.

There were no exceedances for toluene, ethylbenzene, xylenes or the PHC F3 and F4 Fractions in any of the thirty two samples tested as part of the Phase III ESA, and similarly, no exceedances of these parameters, other than the one xylene exceedance, in the eight samples that were tested during the previous Phase II ESA. This included all of the background samples, and samples with the slightly to moderately elevated vapour readings from above and below the impacted soil identified above, and from the test hole locations around the perimeter of the impacted area. In most cases, the reported values were below the laboratory method detection limits.

The exceeded values are from the test holes located in, and around, the area of the former and active USTs. There were no exceedances in the samples collected in the area of the diesel generator on the east side of the hangar, test holes PA-15 and PA-16, or at the southwest corner of the hangar in the area of the interior waste oil tank, test hole PA-11. Impacts were noted in the test holes completed in, and around, the storage shed and exterior drainage pit at the northeast corner of the hangar, however, these impacts are believed to be associated with the UST area.

The lateral extent of soil impact is illustrated on Figure 05 and covers an area of approximately 1,500 m^2. The identified plume extends in all directions from the former and active UST area, however, there is further spreading of the plume towards the north and east, which is consistent with the established local shallow groundwater flow direction. The impacted plume likely extends under the northeast corner of the RCMP Hangar, however, there were no test holes drilled through the concrete slab inside the hangar, as part of the Phase III ESA, to confirm this potential. The impacted soil plume also extends beyond the RCMP leased property onto the City of Prince Albert Airport lands to the east and north. However, there is closure of the plume in all directions.

Vertically, the soil impacts appear to be limited to the lower portion of the sand layer, and other than some residual impacts, do not extend into the underlying clay and silt layers. The combustible organic vapour readings show that the 2.92 m depth samples were not elevated, but the 3.67 m depth samples were significantly elevated, which was confirmed through the laboratory submitted samples. Therefore, the upper boundary of impacted soil is assumed to be about 3.20 m below ground. The lower boundary of impacted soil is established at the interface between the sand and the underlying silt and/or clay units, which corresponds to a depth of about 4.2 to 4.5 m below ground. This equates to an impacted thickness of between 1.0 and 1.3 m.

Using a value of 1.2 m for the average thickness of the impacted layer over the area of impact, 1,500 m^2, the volume of petroleum hydrocarbon impacted soil is estimated to be 1,800 m^3. The volume of non-impacted soil situated above the impacted layer is estimated to be 4,800 m^3, less a small area of surface impact that was noted at the fuel dispensing stand during the repair to the leaking fuel line. This area of surficial impact corresponds to approximately 2 m^3 of petroleum hydrocarbon impacted soil.

5.2.3 Metals

Three soil samples were submitted for metals analysis to assess the location of the unlined drainage pit on the east side of the building, which receives drainage water from the hangar, and the area at the southwest corner of the hangar, near the location of the interior waste oil tank and sump pit, which are located in the chemical room. Samples were submitted from two test holes located near the drainage pit, PA-03/04 and PA-13, and from one test hole located near the southwest corner of the hangar, PA-11. The samples selected for analysis from the area of the drainage pit were from depths of 3.67 and 4.42 m, which correspond to the suspected base of the drainage pit. The sample selected for analysis from the southwest corner of the building was a near surface sample from a depth of 0.77 m to investigate potential surficial impacts. The analytical results are summarized in Table 7, and as shown, all of the results were either below the laboratory method detection limits or below the selected CCME CEQG. Based on the analytical results, the soil in these two areas does not appear to have been impacted by metals.

5.2.4 Volatile Organic Compounds

Three soil samples were submitted for VOC analysis to assess the same two areas discussed in Section 5.2.3. This included the unlined drainage pit on the east side of the hangar, and the area at the southwest corner of the hangar near the interior waste oil tank and sump pit. Samples were submitted from two test holes located near the drainage pit, PA-03/04 and PA-13, and from one test hole located near the southwest corner of the hangar, PA-11. The samples selected for analysis from the area of the drainage pit were from depths of 3.67 and 4.42 m, which correspond to the suspected base of the drainage pit. The sample selected for analysis from the southwest corner of the building was from a depth of 2.92 m below ground to assess potential impacts at depth. The analytical results are summarized in Table 8, and as shown, all of the results were either below the laboratory method detection limits or below the selected CCME CEQG. Based on the results, the soil in these two areas does not appear to have been impacted by VOCs.

5.2.5 Glycols and Oil/Grease

Three soil samples were also submitted for glycol and oil/grease analysis to assess the same two areas discussed in Sections 5.2.3 and 5.2.4. Samples submitted from the drainage pit area, test holes PA-03/04 and PA-13, were from depths of 3.67 and 4.42 m, which correspond to the suspected base of the drainage pit. The sample selected for analysis from the southwest corner of the building was a near surface sample from a depth of 0.77 m to investigate potential surficial impacts.

The analytical results are summarized in Table 9, and as shown, all of the results were below the laboratory method detection limits, with the exception of the oil and grease value at test hole PA-03/04. The reported concentration was 12,000 mg/kg, however, there is no CCME CEQG for this parameter. As discussed in Section 5.2.2, this sample exceeded the PHC F2 Fraction, and the soil at this location is considered to be impacted with petroleum hydrocarbons from the former and active UST area, and not by glycols or oil/grease associated with the drainage pit.

5.3 GROUNDWATER RESULTS

During the previous Phase II ESA, four of the eight test holes were completed as groundwater monitoring wells. Each well was monitored for water level and the presence/absence of LNAPL. The wells were not monitored for combustible organic vapours. Groundwater levels ranged from 3.117 to 3.375 m below ground, on October 2, 2010, with a general direction of groundwater flow to the northeast at a gradient of 0.0046 m/m. There was no evidence of LNAPL detected in the four wells installed as part of the Phase II ESA, however, LNAPL was detected at MWNW, which was located within the backfill on the north side of the active UST and previously completed as part of the UST installation. The measured LNAPL thickness at MWNW was 0.362 m.

Each of the four wells installed during the previous Phase II ESA were sampled and analyzed for petroleum hydrocarbons. Three of the four groundwater samples exceeded the HC-CDWQG for the BTEX parameters and the FCSAP FIGQG for the PHC F2 Fraction. This included samples from wells MW1, MW2 and MW3. Horizontal delineation of the impacted groundwater was not obtained in any direction, and therefore, the area of impacted groundwater was not determined. The previous monitoring well locations are highlighted on Figure 03. The results of the previous analyses are included in Table 10, for reference.

As part of the Phase III ESA, nineteen new groundwater monitoring wells were installed on the RCMP site, and to the east and north on the adjacent City of Prince Albert Airport property. The new wells were installed: to supplement the six existing wells (four wells from the Phase II ESA and two wells located in the UST backfill material); to assist in delineating the extent of petroleum hydrocarbon impact in the groundwater; and to also assess the potential for metal, VOC, glycol and oil/grease impacts in the groundwater from other on-site areas of environmental concern.

The fifteen new wells, PA-01 through PA-14 and PA-17, which were installed on August 2 and 3, 2011, and the six existing on-site wells, MW1 through MW4, MWNW and MWSE, were monitored for water levels, combustible organic vapours and LNAPL on August 4 and 24, 2011. The four additional wells, PA-18 through PA-21, which were installed during the supplemental investigation on October 3, 2011, were monitored on October 4, 2011, along with the twenty-one other points. The results of the groundwater monitoring are summarized in Table 4 and the monitoring well locations highlighted on Figure 03.

Following completion of the monitoring activities, each of the new and existing wells were assessed for general in-situ field parameters and then sampled for the various contaminants of concern. The exception were the wells containing LNAPL. Measurement of the field parameters and completion of the water sampling was undertaken on August 4, 2011 and October 4, 2011, following installation of the initial wells on August 2 and 3, 2011, and the supplemental wells on October 3, 2011, respectively.

The results from the Phase III ESA groundwater monitoring/sampling activities are summarized below.

5.3.1 Groundwater Elevation

Based on the October 4, 2011 water level measurements, as shown in Table 4, the calculated piezometric elevations ranged from 96.144 m, at PA-08 located northeast of the UST, to 96.607 m, at MW4 located at the northwest corner of the hangar. The calculated piezometric elevations and interpreted groundwater flow direction are shown on Figure 04, and indicate flow is to the north and northeast at a gradient of 0.02 to 0.05 m/m. The interpretation excluded the two wells installed within the UST backfill materials, MWNW and MWSE, and the piezometric elevations were adjusted upward to include the LNAPL thickness, where present. The interpreted groundwater flow shown on Figure 04 is generally consistent with the findings from the previous Phase II ESA. The vertical gradient, based on the water level measurements recorded at the two nested well pairs, PA-01/02 and PA-03/04, appears to be upward at 0.014 to 0.032 m/m.

5.3.2 Combustible Organic Vapours

Field screening of combustible organic vapours in the wells was completed using a GasTech Model 1238 ME analyzer. As illustrated in Table 4, elevated readings were recorded on one or more occasions at the following monitoring wells:

- PA-02 - 11 to 23% LEL;
- PA-03 - 9% LEL
- PA-04 - 10 to 27% LEL;
- PA-05 - 4% LEL;
- PA-08 - 14% LEL;

- PA-13 - 8% LEL;
- PA-18 - 6% LEL; and
- MW2 - 12 to 13% LEL.

Where multiple sets of readings were obtained, the combustible vapour concentrations were noted to: decrease over time in monitoring wells PA-03, PA-04, PA-05, PA-07, PA-08, PA-09, PA-10, PA-12, PA-13, PA-14, MWNW, MWSE, MW1, MW2 and MW4; increase in monitoring wells PA-02, PA-06, PA-17 and MW3; and remain constant at monitoring wells PA-01 and PA-11. There was only one set of readings taken at wells PA-18 through PA-21, and therefore, it is not possible to comment on the trends at these locations.

5.3.3 Light Non-aqueous Phase Liquids

LNAPL monitoring was completed using a Heron Model H.01L Interface Probe, and as illustrated in Table 4, LNAPL was detected at the following monitoring well locations over the three monitoring events that were completed:

- PA-01 - 0.225 to 0.408 m;
- PA-03 - 0.084 to 0.247 m;
- PA-05 - 0.105 to 0.417 m;
- PA-08 - 0.298 to 0.476 m;
- PA-13 - 0.001 to 0.010 m;
- PA-18 - 0.000 to 0.079 m;
- MWNW - 0.189 to 0.447 m;
- MWSE - 0.118 to 0.329 m;
- MW2 - 0.254 to 0.378 m; and
- MW3 - 0.162 to 0.341 m.

All of the above LNAPL values increased in thickness between August and October 2011, with the exception of PA-13, which has declined after each monitoring event. A reading of 0.001 m was recorded at monitoring well MW4 on August 4, 2011, however, non-detectable readings were previously and subsequently obtained at this location on October 2, 2010, August 24, 2011 and October 4, 2011. The trace reading on August 4, 2011, is therefore, considered to be an anomaly and this well has not been included in the LNAPL category. However, the well will continue to be monitored over time for the presence/absence of LNAPL.

The lateral extent of LNAPL is illustrated on Figure 06 and covers an area of approximately 1,100 m^2. The identified plume extends in all directions from the former and active UST area, however, there is further spreading of the plume towards the north and east, which is consistent with the established local shallow groundwater flow direction. The impacted plume likely extends under the northeast corner of the RCMP Hangar, however, there were no test holes drilled through the concrete slab inside the hangar, as part of the Phase III ESA, to confirm this potential. The LNAPL plume also extends beyond the RCMP leased property onto the City of Prince Albert Airport lands to the east and north. However, there is closure of the plume in all directions.

Based on the October 4, 2011 measurements, the average thickness of the LNAPL was 0.310 m. Multiplying the average LNAPL thickness by the area of the plume yields an estimated volume of 340 m^3. Proven methods for accurate and reliable estimation of mobile LNAPL volumes using apparent LNAPL thicknesses are not currently available, however, most calculation methods yield order of magnitude estimates [(19)]. Assuming a porosity value of 0.25 for the medium to fine grained sand, an order of magnitude estimate for the volume of LNAPL present at the site is 85,000 litres (plume area of 1,100 m^2 multiplied by the apparent thickness of 0.310 m multiplied by the assumed porosity of 0.25 multiplied by a factor of 1,000 litres per m^3).

As part of the Phase III ESA, samples of the LNAPL were collected from monitoring wells PA-08, MW2 and MWSE. One sample of the Jet A fuel was also collected directly from the active UST. The results of the analysis are provided in Table 10, along with a previous sample of the LNAPL from MWNW, which was analyzed during the previous Phase II ESA in 2010, report dated April 2011. The Phase III ESA results are relatively consistent, and indicate the highest concentrations are for the PHC F1 Fraction, followed by the PHC F2 Fraction and xylenes. This profile and the resultant chromatograms included in Appendix G are consistent with a Jet A petroleum hydrocarbon profile. The results from the previous Phase II ESA noted significantly higher values for the PHC F2 and F3 Fractions in the LNAPL submitted from well MWNW, however, due to breakage of one of the sample containers, the BTEX and PHC F1 Fractions in the LNAPL were not analyzed during the Phase II ESA.

5.3.4 Field Chemistry

In-situ field measurement of temperature, conductivity, total dissolved solids (TDS), dissolved oxygen (DO), pH and oxygen reduction potential (ORP) was completed using a YSI 556 Multi probe meter. In-situ measurement of turbidity was also completed using a Hanna Instruments HI 98703 Turbidimeter. The field measurements are presented in Table 5, and the range of values are summarized below:

- Temperature ranged from 6.96^o Celsius at PA-07 to 10.55 ^{o} Celsius at PA-13;
- Conductivity ranged from 0.743 mS/cm at PA-13 to 1.668 mS/cm at PA-20;
- TDS ranged from 0.666 mg/L at PA-13 to 1.558 mg/L at PA-20;
- DO ranged from 2.24 mg/L at PA-07 to 9.25 mg/L at PA-12;
- pH ranged from 5.69 at PA-06 to 6.64 at MW1;
- ORP ranged from -17.3 mV at PA-13 to +6.7 mV at PA-06; and
- Turbidity ranged from 11.2 NTU at PA-17 to 63.9 at PA-19.

A review of the individual results shows some trending to higher conductivity and TDS values in the wells further afield to the north, east and southeast. The recorded DO and ORP values are also generally higher at the perimeter wells in comparison to the central points. Although not definitive at this time, the results would suggest that there is some natural bio-degradation occurring in the area of the impacted plume.

Due to insufficient water volumes the two deeper wells, PA-02 and PA-04, were not monitored for general field chemistry. However, these wells were still assessed for the identified contaminants of concern at each point.

5.3.5 Petroleum Hydrocarbons

Upon completion of the drilling activities, and following the groundwater monitoring described above, representative samples of the groundwater were collected from each of the groundwater wells where LNAPL was not present. The majority of the groundwater samples were collected on August 4, 2011. The exceptions were: well PA-02, which was collected on August 24, 2011 to allow time for the water level to stabilize in this deep well; and wells PA-18 through PA-21, which were collected on October 4, 2011 after completion of the supplemental site investigation. The collected samples were submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. The results are summarized in Table 11, along with the analytical results for MW1 through MW4, which were obtained during the previous Phase II ESA.

As shown in Table 11, the submitted samples from wells PA-07 and PA-13 exceeded the selected FCSAP FIGQG for the PHC F2 Fraction. The PHC F2 Fraction was also exceeded at wells MW1 through MW3 during the previous Phase II ESA. The recent results at well MW1 are below the selected criteria, whereas MW2 and MW3 currently show evidence of LNAPL. The wells with LNAPL are also assumed to exceed the selected criteria.

At the two nested well pairs, PA-01/02 and PA-03/04, the two shallow wells, PA-01 and PA-03 contained LNAPL, while the corresponding deep wells, PA-02 and PA-04 did not. The samples from the two deep wells were also both below the selected FCSAP FIGQG, indicating limited vertical contaminant movement.

If the HC-GCDWQ are applied to the site, the following exceedances would also be noted:

- PA-02 for benzene, toluene and ethylbenzene;
- PA-04 for ethylbenzene;
- PA-07 for benzene, toluene, ethylbenzene and xylenes;
- PA-09 for ethylbenzene;
- PA-13 for benzene, toluene, ethylbenzene and xylenes; and
- PA-19 for benzene.

The lateral extent of impacted groundwater is illustrated on Figure 07 and covers an area of approximately 1,500 m^2. The area of impact includes all wells with LNAPL and the two additional wells that exceeded the FCSAP FIGQG. The identified plume extends in all directions from the former and active UST area, however, there is further spreading of the plume towards the north and east, which is consistent with the established local shallow groundwater flow direction. The impacted plume likely extends under the northeast corner of the RCMP Hangar, however, there were no test holes drilled through the concrete slab inside the hangar, as part of the Phase III ESA, to confirm this potential. The plume also extends beyond the RCMP leased property onto the City of Prince Albert Airport lands to the east and north. However, there is closure of the plume in all directions.

A sensitivity analysis utilizing the drinking water criteria from the HC-GCDWQ indicates that two additional wells, PA-09 to the west and PA-19 to the northeast, would also show exceedances for the BTEX parameters. The extent of impacted groundwater, exceeding the HC-GCDWQ, is also highlighted on

Figure 07 and covers an area of 2,500 m^2. Laterally, there is still closure of the impacted groundwater plume in most directions. The two exceptions are to the northeast of well PA-19 and to the west between wells PA-09 and PA-20.

5.3.6 Metals

Three groundwater samples were submitted for metals analysis to assess the location of the unlined drainage pit on the east side of the building, which receives drainage water from the hangar, and the area at the southwest corner of the hangar, near the location of the interior waste oil tank and sump pit, which are located in the chemical room. Samples were submitted from the nested well pair near the drainage pit, wells PA-03 and PA-04, and from the one well near the southwest corner of the Hangar, well PA-11.

The analytical results are summarized in Table 12, and as shown, all of the results were either below the laboratory method detection limits or below the HC-GCDWQ. The exception was elevated levels of manganese. However, the selected HC-GCDWQ value for manganese is an aesthetic objective and does not pose a risk to human health or the environment. The elevated values may also represent naturally occurring levels in the groundwater. There are no applicable FCSAP FIGQG values for the metal parameters, therefore, the HC-GCDWQ values have been used for comparative purposes. Based on the analytical results, the groundwater in these two areas does not appear to have been impacted by metals.

5.3.7 Volatile Organic Compounds

Two groundwater samples were submitted for VOC analysis to assess the same two areas discussed in Section 5.3.6. This included the unlined drainage pit on the east side of the hangar, and the area at the southwest corner of the hangar near the interior waste oil tank and sump pit. Samples were submitted from the deep well of the nested well pair near the drainage pit location, well PA-04, and from the one well near the southwest corner of the Hangar, PA-11. The analytical results are summarized in Table 13, and as shown, all of the results were either below the laboratory method detection limits or below the FCSAP FIGQG and HC-GCDWQ. Based on the analytical results, the groundwater in these two areas does not appear to have been impacted by VOCs.

5.3.8 Glycols and Oil and Grease

Three groundwater samples were also submitted for glycol and oil/grease analysis to assess the same two areas discussed in Sections 5.3.6 and 5.3.7. Samples were submitted from the nested well pair near the drainage pit, wells PA-03 and PA-04, and from the one well near the southwest corner of the Hangar, well PA-11. The analytical results are summarized in Table 14, and as shown, all of the results were below the laboratory method detection limits, with the exception of the oil and grease value at well PA-04. The reported concentration was 3 mg/l, however, there is no guideline for this parameter. Due to the presence of LNAPL, well PA-03 was not analyzed for oil and grease. Based on the presence of LNAPL at well PA-03, this location is impacted with petroleum hydrocarbons, however, the impacts are considered to be from the former and active UST area, and not associated with the drainage pit. Based on the analytical results, the groundwater does not appear to have been impacted by the potential discharge of glycols.

5.4 QA/QC RESULTS

Quality assurance/quality control (QA/QC) measures implemented during the Phase III ESA are documented under the field methodologies discussed in Section 2.0 and within the QA/QC program discussed in Section 4.3. This included the submission of three blind duplicate soil samples for analysis of the BTEX components and the PHC F1 to F4 Fractions. Two samples, one from test hole PA-08 (labelled BD1) and one from test hole PA-09 (labelled BD2), were submitted from the August 2011 investigation, and one sample from test hole PA-18 (labelled PA-BD1), was submitted from the October 2011 investigation. All three samples were collected from a depth of 3.67 m below grade. One blind duplicate soil sample was also submitted for analysis of metals, VOCs, oil and grease, and glycols from test hole PA-03/04 at a depth of 3.67 m below ground (labelled BD3).

Three blind duplicate groundwater samples were also submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. This included samples from: well PA-04 (labelled BDW1); well PA-07 (labelled BDW2); and well PA-19 (labelled PA-BDW2). Sample BDW1, from PA-04, was also submitted for analysis of metals, VOCs, glycols, and oil and grease.

One field blank (labelled PA-FB) was prepared in the field using distilled water, and was submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. One travel blank (labelled PA-TB) was prepared by the analytical laboratory, traveled with the sample containers at all times, and was also submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions.

The original and duplicate soil results for the BTEX and PHC F1 to F4 Fractions are summarized in Table 15, along with the calculated relative percent difference (RPD) for each parameter. As noted, several of the results from the original and/or duplicate samples were below the laboratory method detection limits, and therefore, it is not possible to calculate a RPD for these parameters. This included all of the values for the sample from PA-09/BD2. The average RPDs for the detectable parameters were 22.7% for the sample from PA-08/BD1 and 6.5% for the sample from PA-18/PA-BD1, which are within or below the industry standard of +/- 15 to 25%.

The original and duplicate soil results for the metal, VOC, Glycol and oil/grease parameters for the sample from PA-03/04/BD3 are summarized in Table 16, along with the calculated RPD for each parameter. As noted, several of the results from the original and/or duplicate samples were below the laboratory method detection limits, and therefore, it is not possible to calculate a RPD for these parameters. The average RPD's for the detectable parameters were 6.3% for the metals and 23.6% for the VOCs, which are within or below the industry standard of +/- 15 to 25%. The results were below the laboratory method detection limits for the glycols, and therefore, an RPD was only calculated for oil and grease, which was 28.6%. This value is just above the industry standard, and the variability is likely due to sample heterogeneity.

The original and duplicate groundwater results for the BTEX and PHC F1 to F4 Fractions are summarized in Table 17, along with the calculated RPD for each parameter. As noted, several of the results from the original and/or duplicate samples were below the laboratory method detection limits, and therefore, it is not possible to calculate a RPD for these parameters. The average RPDs for the detectable parameters were 14.3% for the sample from PA-04/BDW1, 25.9% for the sample from PA-07/BDW2 and 8.0% for the sample from PA-19/PA-BDW2, which are below or slightly above the industry standard of +/- 15 to 25%.

The original and duplicate groundwater results for the metal, VOC, Glycol and oil/grease parameters for the sample rom PA-04/BDW1 are summarized in Table 18, along with the calculated RPD for each parameter. As noted, several of the results from the original and/or duplicate samples were below the laboratory method detection limits, and therefore, it is not possible to calculate a RPD for these parameters. The average RPD's for the detectable parameters were 4.5% for the metals and 26.0% for the VOCs, which are below and just above the industry standard of +/- 15 to 25%, respectively. The results were below the laboratory method detection limits for the glycols, and therefore, an RPD was only calculated for oil and grease, which was 50.0%. This value is above the industry standard, and the variability is likely due to sample heterogeneity.

Trip and field blank samples were analyzed for the BTEX parameters and the PHC F1 to F4 Fractions. The results are summarized in Table 19, and as shown, all of the results were below the laboratory method detection limits, with the exception of a trace concentration of toluene in the field blank. The reported value was well below the applicable criteria and there were no reported toluene exceedances in any of the submitted groundwater samples.

Based on the QA/QC results, the findings of the soil and groundwater analyses are considered to be valid and representative of the local soil and groundwater quality. The results also support the field QA/QC procedures, which were implemented. Copies of the laboratory reports are presented in Appendix G.

6.0 NCSCS SCORE

The 2008 National Classification System for Contaminated Sites (NCSCS) [(4)] ranks contaminated sites into five general categories of concern (Class 1, High Priority for Action; Class 2, Medium Priority for Action; Class 3, Low Priority for Action; Class N, Not a Priority for Action; and Class INS, Insufficient Information) according to their current or potential adverse impact on human health or the environment. It is used to screen sites with respect to "need for further action" (i.e further characterization, risk assessment, remediation, etc.). The hazard or hazard potential of a site is evaluated by scoring site characteristics ("evaluation factors") that can be grouped under one of three categories:

I. **Contaminant Characteristics** - the relative hazard of contaminants present at a site.

II. **Migration Potential -** the route a contaminant may follow to a receptor (i.e. groundwater, surface water, soil vapour, sediment movement, modifying factors).

III. **Exposure -** receptors, living things that may be exposed to and impacted by contamination (i.e. humans, plants, animals or environmental resources).

A scoring system (from 0 to 100 points) is used as a means of assessing the hazard of a site. Sites that exhibit observable or measured impacts on the surrounding environment or have a high potential for causing negative impact will score higher under the system.

Based on answering "yes" to Question 6 on the pre-screening form, indicating that LNAPL is present in the exposure zone, the site is automatically assigned a **Site Classification Category** of **1**, indicating the site is a **High Priority for Action**. The total score for the site was still calculated, however, for comparison with other Class 1 sites.

Based on the site specific information presented in the previous Phase II ESA report and the soil and groundwater quality information collected during the current Phase III ESA, the site was classified under the 2008 CCME NCSCS using the updated 2010 Version 1.2 spreadsheet. The completed scoring sheets are presented in Appendix H. On the basis of the available information, application of the NCSCS criteria produced category scores as follows:

FACTOR CATEGORY	CATEGORY SCORE	MAXIMUM SCORE
Contaminant Characteristics	24.8	33
Migration Potential	22.6	33
Exposure	17.0	34
TOTAL SCORE	**64.4**	**100**

However, as noted above, this score should only be used in the context of comparison with other Class 1 sites.

7.0 REMEDIAL OPTIONS EVALUATION

The objective of the Remedial Options Evaluation (ROE) is to provide an assessment of the remedial alternatives applicable for the site (in-situ, ex-situ and risk management), including the advantages and disadvantages of each technique. It is understood that the objective of any remedial alternative is to: achieve concentrations of contaminants that satisfy the applicable regulatory criteria for soil and/or groundwater; or manage the identified impacts in place such that they do not pose a significant risk to human health or the environment.

As part of the previous Phase II ESA undertaken in October 2010, report dated April 2011, eight test holes were drilled around the location of the former and active USTs in order to confirm the presence/absence of impacted soil. Four of the eight submitted soil samples exceeded the selected CCME CEQG and CWS for one or more of the BTEX parameters, and the PHC F1 and F2 Fractions. Vertical delineation of the impacted soil was not obtained, as there were no samples submitted from below the impacted sand layer. Horizontal delineation was also incomplete to the north and east. Therefore, the volume of impacted soil was not determined. The exceeded values were noted within the sand layer between a depth of 3.0 and 4.0 m below grade, and were located northeast, east and southeast of the former/active USTs. LNAPL was detected at one well, which was discovered on-site during the investigation and located within the UST backfill material. Based on the results, a Phase III ESA was recommended.

As part of the recent Phase III ESA, twenty-one test holes were drilled on the RCMP Hangar property, and on the adjacent City of Prince Albert Airport property to the east and north. The primary purpose of the program was to obtain horizontal and vertical delineation of the impacted soil, and groundwater, based on the findings from the previous Phase II ESA. The results from the Phase III ESA identified petroleum hydrocarbon impacted soil near the UST area. The volume of petroleum hydrocarbon impacted soil is estimated to be 1,800 m^3. The lateral and vertical extent of the identified petroleum hydrocarbon impacts in the soil are well defined. An area of petroleum impacted groundwater is also present on-site, and is estimated at 1,500 m^2. LNAPL was also detected at ten of the on-site wells and the total area of LNAPL was estimated at 1,100 m^2 with an average thickness of 0.31 m. Clean test holes/wells with no LNAPL and no soil or groundwater exceedances are located around the perimeter of the impacted plumes in all directions. The lateral extent of the impacted soil, LNAPL, and impacted groundwater plumes are highlighted on Figures 05, 06 and 07, respectively. The vertical extent of impacted soil and LNAPL are also highlighted in a north-south cross-section on Figure 08.

Based on the above, immediate action is required to address the recovery of LNAPL from the property. This action is also necessary, before options can be considered for remediation or risk management of the impacted soil and groundwater. To facilitate removal of the LNAPL, it is recommended to install a minimum of two large diameter recovery wells in the central area of the LNAPL plume. These large diameter recovery wells should be at least 0.75 m in diameter and should be screened over the area of impact, from 3.0 to 4.5 m below ground. The LNAPL can then be pumped directly from the recovery wells, via a manual or automated pumping system, into temporary drums or an AST. Due to the volume of LNAPL present on site, manual bailing is not considered viable. The rate of LNAPL recovery should be monitored on a regular basis and the program adjusted, as required, to maximize the rate of recovery.

8.0 CONCLUSIONS AND RECOMMENDATIONS

EGE was retained by PWGSC to conduct a Phase III ESA at the RCMP Hangar located at 190 Airport Road in Prince Albert, Saskatchewan. The program was completed under the Environmental Services Supply Agreement, PWGSC File Number R.042523.005, and in accordance with EGE's proposal for environmental services, dated June 27, 2011 (1). The Phase III ESA was conducted following the principals and general practices set out by the CSA guideline Z769-00 Phase II Environmental Site Investigation R2004 (2). As outlined in the Terms of Reference (3), the specific project objectives included:

- A detailed intrusive Phase III ESA investigation to determine the type of contamination at the site in all media, the source of contamination, to delineate the extent and calculate the volume of contamination, and to determine the likelihood of contaminant migration off-site;

- Further characterization of the site with respect to the local and regional geology, hydrogeology, and hydrology, in order to characterize the groundwater direction and flow;

- Development of a Remedial Options Evaluation with a minimum of two options to address the impacted soil and groundwater, including associated costs;

- Development of an indicative estimate of liability or contingent liability, as per the Treasury Board Secretariat reporting requirements;

- Classification of the impacted site, according to the 2008 CCME NCSCS (4); and

- Preparation of a summary report based on the findings from the intrusive site investigation program.

The work plan included the development, and implementation, of a field and analytical program that targeted one area of impact, as documented in an earlier Phase II ESA report prepared by the KGS Group, dated April 2011 (5), as well as, three additional areas identified by EGE. This included: an area of petroleum hydrocarbon impacted soil and groundwater, which is associated with the current and former USTs, and fuel dispensing stand northeast of the hangar; an unlined drainage pit on the east side of the hanger that receives drainage from inside the hangar; a diesel generating unit east of the hangar; and an interior waste oil storage tank located inside the chemical room at the southwest corner of the hangar. The field investigation included: drilling twenty-one test holes that focused on potential impacts within the soil; and the installation of nineteen monitoring wells to supplement the six existing wells and to assess potential impacts to the underlying groundwater quality.

Soil samples were collected at regular intervals from each of the test hole locations and the samples screened in the field for combustible organic vapour levels. The majority of the vapour readings were below 50 ppm and reflect background concentrations. There were a select number of samples with slightly to moderately elevated readings that were between 50 and 500 ppm. These samples were typically from above and/or below the identified zones of soil impact, and from the test holes located around the margins of the more highly impacted test hole locations.

Within the area of the former and active USTs, highly elevated readings (greater than 500 ppm) were noted at seven of the test hole locations. In all cases, the combustible organic vapour readings in the samples from above these zones were near background levels or slightly to moderately elevated and vapour readings returned to background levels below these zones. In all cases, the highly elevated vapour readings were within the layer of sand that is located below the fine grained surface soil, and above the underlying fine grained silts and clays.

Thirty-two soil samples were subsequently submitted for laboratory analysis of the BTEX components and the PHC F1 to F4 Fractions. The samples were generally chosen based on analyzing the samples with the highest combustible organic vapour reading at each of the test hole locations. This included all of the samples with the highly elevated vapour readings and presence of hydrocarbon odors, and select background samples from above and below these zones, and from the margins of the impacted test hole locations.

Six of the submitted soil samples exceeded one or more of the selected CCME CEQG and CWS values for benzene, and the PHC F1 and F2 Fractions. There were no exceedances for toluene, ethylbenzene, xylenes or the PHC F3 and F4 Fractions. This included all of the background samples, and the samples with the slightly to moderately elevated vapour readings from above and below the impacted soil, and from the test hole locations around the perimeter of the impacted area. In most cases, the reported values were below the laboratory method detection limits. Four of the eight samples submitted from the previous Phase II ESA also exceeded one or more of the selected CCME CEQG and CWS values for benzene, and the PHC F1 and F2 Fractions. There was also one sample, which exceeded the criteria for xylene.

The exceeded values are from the test holes located in, and around, the area of the former and active USTs. There were no exceedances in the samples collected in the area of the diesel generator on the east side of the hangar or at the southwest corner of the hangar in the area of the interior waste oil tank. Impacts were noted in the test holes completed in, and around, the storage shed and drainage pit at the northeast corner of the hangar, however, these impacts are believed to be associated with the UST area.

The lateral extent of petroleum hydrocarbon impacted soil is estimated at 1,500 m^2. The plume extends in all directions from the former and active UST area, however, there is further spreading of the plume towards the north and east, which is consistent with the established local shallow groundwater flow direction. The impacted plume likely extends under the northeast corner of the RCMP Hangar, however, there were no test holes drilled through the concrete slab inside the hangar, as part of the Phase III ESA, to confirm this potential. The impacted soil plume also extends beyond the RCMP leased property onto the City of Prince Albert Airport lands to the east and north. However, there is closure of the plume in all directions.

Vertically, the soil impacts appear to be limited to the lower portion of the sand layer, and other than some residual impacts, do not extend into the underlying clay and silt layers. Based on the combustible organic vapour readings and laboratory results, the upper boundary of impacted soil is assumed to be at 3.20 m below ground and the lower boundary at a depth of 4.2 to 4.5 m below ground. This equates to an impacted thickness of between 1.0 and 1.3 m. Using a value of 1.2 m, as the average thickness of the impacted layer, and an area of 1,500 m^2, the volume of petroleum hydrocarbon impacted soil is estimated to be 1,800 m^3. The volume of non-impacted soil situated above the impacted layer is estimated to be 4,800 m^3, less a small area of surface impact that was noted at the fuel dispensing stand during the repair to the leaking fuel line. This area of surficial impact corresponds to approximately 2 m^3 of petroleum hydrocarbon impacted soil.

Three soil samples were also submitted for metal, VOC, glycol and oil/grease analysis, to assess the location of the unlined drainage pit on the east side of the building, which receives drainage water from the hangar, and the area at the southwest corner of the hangar, near the location of the interior waste oil tank and sump pit, which are located in the chemical room. All of the results were below the laboratory method detection limits or the selected CCME CEQG. Based on the results, the soil in these two areas does not appear to have been impacted by metals, VOCs, glycols or oil/grease.

Nineteen monitoring wells were installed as part of the recent Phase III ESA: to supplement the six existing on-site wells (four wells from the previous Phase II ESA and two wells located in the UST backfill material); to assist in delineating the extent of petroleum hydrocarbon impact in the groundwater; and to also assess the potential for metal, VOC, glycol and oil/grease impacts in the groundwater from other on-site areas of environmental concern.

Based on the October 4, 2011 water level measurements, the calculated piezometric elevations ranged from 96.144 m northeast of the UST to 96.607 m at the northwest corner of the hangar, and indicate flow is to the north and northeast at a gradient of 0.02 to 0.05 m/m. The interpretation excluded the two wells installed within the UST backfill materials and the piezometric elevations were adjusted upward to include the LNAPL thickness, where present. The interpreted groundwater flow is consistent with the findings from the previous Phase II ESA. The vertical gradient, based on the water level measurements recorded at the two nested well pairs, appears to be upward at 0.014 to 0.032 m/m.

Field screening of combustible organic vapours in the wells showed elevated readings of greater than 500 ppm at eight locations. Where multiple sets of readings were obtained, the vapour concentrations were noted to decrease over time at fifteen wells, increase at four wells and remain constant at two wells.

LNAPL was detected at ten monitoring well locations and covers an area of approximately 1,100 m^2. The identified plume extends in all directions from the former and active UST area, however, there is further spreading of the plume towards the north and east, which is consistent with the established local shallow groundwater flow direction. The impacted plume likely extends under the northeast corner of the RCMP Hangar, however, there were no test holes drilled through the concrete slab inside the hangar, as part of the Phase III ESA, to confirm this potential. The LNAPL plume also extends beyond the RCMP leased property onto the City of Prince Albert Airport lands to the east and north. However, there is closure of the plume in all directions.

Based on the October 4, 2011 measurements, the average thickness of the LNAPL was 0.310 m. Multiplying the average LNAPL thickness by the area of the plume and assuming an effective porosity of 0.25, an order of magnitude estimate for the volume of LNAPL present at the site is 85,000 litres.

Samples of the LNAPL were collected from three of the monitoring wells and one sample of the Jet A fuel was also collected directly from the active UST. The results were relatively consistent, and indicate the highest concentrations are for the PHC F1 Fraction, followed by the PHC F2 Fraction and xylenes. This profile and the resultant chromatograms are consistent with a Jet A petroleum hydrocarbon profile.

In-situ field measurement of temperature, conductivity, TDS, DO, pH, ORP and turbidity was also completed as part of the Phase III ESA field program. A review of the individual results showed some trending to higher conductivity and TDS values in the wells further afield to the north, east and southeast. The recorded DO and ORP values were also generally higher at the perimeter wells in comparison to the central points. Although not definitive at this time, the results would suggest that there is some natural bio-degradation occurring in the area of the impacted plume.

Representative samples of the groundwater were collected from each of the wells where LNAPL was not present. The collected samples were submitted for analysis of the BTEX components and the PHC F1 to F4 Fractions. Two of the submitted samples exceeded the selected FCSAP FIGQG for the PHC F2 Fraction. The wells with LNAPL are also assumed to exceed the selected criteria. At the two nested well pairs, the two shallow wells contained LNAPL, while the corresponding deep wells did not. The samples from the two deep wells were also both below the selected FCSAP FIGQG, indicating limited vertical contaminant movement.

Based on the above findings, the lateral extent of impacted groundwater covers an area of approximately 1,500 m^2. The identified plume extends in all directions from the former and active UST area, however, there is further spreading of the plume towards the north and east, which is consistent with the established local shallow groundwater flow direction. The impacted plume likely extends under the northeast corner of the RCMP Hangar, however, there were no test holes drilled through the concrete slab inside the hangar, as part of the Phase III ESA, to confirm this potential. The plume also extends beyond the RCMP leased property onto the City of Prince Albert Airport lands to the east and north. However, there is closure of the plume in all directions.

A sensitivity analysis, utilizing the drinking water criteria from the HC-GCDWQ, indicates that two additional wells, one to the west and one to the northeast, would also show exceedances for the BTEX parameters. The extent of impacted groundwater, exceeding the HC-GCDWQ, covers an area of approximately 2,500 m^2. Laterally, there is still closure of the impacted groundwater plume in most directions. The two exceptions are a small area to the northeast and a small area to the west.

Three groundwater samples were also submitted for metal, glycol and oil/grease analysis, along with two groundwater samples for VOC analysis, to assess the location of the unlined drainage pit on the east side of the building, which receives drainage water from the hangar, and the area at the southwest corner of the hangar, near the location of the interior waste oil tank and sump pit, which are located in the chemical room. All of the results were below the laboratory method detection limits or the selected FCSAP FIGQG and/or HC-GCDWQ. The exception was elevated levels of manganese. However, the selected HC-GCDWQ value for manganese is an aesthetic objective and does not pose a risk to human health or the environment. The elevated values may also represent naturally occurring levels in the groundwater. The HC-GCDWQ values were used where there were no applicable FCSAP FIGQG. Based on the results, the groundwater in these two areas does not appear to have been impacted by metals, VOCs, glycols or oil/grease.

The site was scored using the 2008 NCSCS [(4)] and based on answering “yes” to Question 6 on the pre-screening form, indicating that LNAPL is present in the exposure zone, the site was automatically assigned a **Site Classification Category** of **1**, indicating that the site is a **High Priority for Action**. However, the total score for the site was still calculated for comparison with other Class 1 sites and was 64.4 out of 100.

Based on the presence of LNAPL on the property, immediate action is required to address the recovery of LNAPL before options can be considered for remediation or risk management of the impacted soil and groundwater. To facilitate removal of the LNAPL, it is recommended to install a minimum of two large diameter recovery wells in the central area of the LNAPL plume. These large diameter recovery wells should be at least 0.75 m in diameter and should be screened over the area of impact, from 3.0 to 4.5 m below ground. The LNAPL can then be pumped directly from the recovery wells, via a manual or automated pumping system, into temporary drums or an AST. Due to the volume of LNAPL present on site, manual bailing is not considered viable. The rate of LNAPL recovery should be monitored on a regular basis and the program adjusted, as required, to maximize the rate of recovery.

9.0 CLOSURE

This report has been prepared by EGE Engineering Ltd. (EGE) for the exclusive use of Public Works and Government Services Canada and the RCMP (the Client) for the specific application described in Section 1.0. The information and data contained herein are to be treated as confidential and are intended for the sole use of the client, and may not be relied upon by any other persons or entity without the express written consent of EGE and the Client.

Any use of this report by a third party, or any reliance on decisions made based on it, are the responsibility of such third parties. EGE does not accept any responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

The work has been conducted in accordance with generally accepted environmental engineering practices. Although every effort has been made to confirm that the information and data presented, including without limitation the results of any sampling and analyses conducted by EGE, is factual, complete and accurate, EGE makes no guarantees or warranties whatsoever, whether expressed or implied, with respect to such information or data.

The findings presented in this report are based on the conditions which existed on site at the time of the work, in the area of the work and in respect of the environmental media which were assessed. The Client, and any other parties using this report with the express written consent of the Client and EGE, should acknowledge that conditions affecting the site can vary with time, may vary in other areas of the site and that other media other than those described herein could be present on site. EGE cannot warrant against undiscovered environmental liabilities.

Should additional environmental information become available in the area of concern or in other areas of the site, EGE requests that this information be brought to our attention so that we may re-evaluate the findings and conclusions of this report.

Respectively Submitted,

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TABLES

Table 1 - Soil and Groundwater Sampling Locations - GPS Coordinates

Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262

190 Airport Road - Prince Albert, Saskatchewan - February 2012

Test Hole	GPS Coordinates (13U)	
	Easting	Northing
New Test Holes/Monitoing Wells (EGE, 2011)		
PA-01	454358.2	5896424.0
PA-02	454358.0	5896424.2
PA-03	454353.9	5896409.5
PA-04	454354.2	5896409.2
PA-05	454355.2	5896427.9
PA-06	454377.6	5896415.0
PA-07	454371.2	5896430.0
PA-08	454357.3	5896438.8
PA-09	454336.2	5896428.4
PA-10	454332.7	5896415.3
PA-11	454323.5	5896378.5
PA-12	454354.9	5896387.9
PA-13	454349.9	5896403.8
PA-14	454372.7	5896403.6
PA-15	454350.1	5896391.3
PA-16	454351.6	5896389.4
PA-17	454386.6	5896438.8
PA-18	454364.9	5896445.4
PA-19	454376.5	5896468.6
PA-20	454333.2	5896466.6
PA-21	454355.4	5896478.5
Existing Wells (KGS, 2011 and Others)		
MWNW	454351.3	5896427.5
MWSE	454355.9	5896416.9
MW1	454356.7	5896403.6
MW2	454363.5	5896416.8
MW3	454353.6	5896414.5
MW4	454316.3	5896415.8

Table 2 - Combustible Organic Vapours in Soil

Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262

190 Airport Road - Prince Albert, Saskatchewan - February 2012

Test Hole	Date of Drilling (yy/mm/dd)	Sample Depth (m)	Soil Type	Vapour Concentration (ppm)	Vapour Concentration (% LEL)	Lab Analyses
PA-01/02	11/08/02-03	0.77	Sand (fill)	5	< 1	
		1.92	Sand (fill)	10	< 1	
		2.17	Sand (fill)	175	1%	
		2.92	Sand	20	< 1	
		3.67	**Sand**	**> 500**	**32%**	**BTEX, PHCs**
		4.42	Sand	> 500	5%	
		5.17	**Silt**	**215**	**1%**	**BTEX, PHCs**
		5.92	Silt	30	< 1	
		6.67	Clay	85	< 1	
		7.42	Silt	20	< 1	
		8.17	Clay	20	< 1	
		8.92	**Clay**	**300**	**2%**	**BTEX, PHCs, Particle Size**
		9.67	Clay	260	2%	
		10.42	Clay	265	2%	
PA-03/04	11/08/02	0.77	Silt (fill)	15	< 1	
		1.92	Sand	0	< 1	
		2.17	Sand	20	< 1	
		2.92	Sand	25	< 1	
		3.67	**Sand**	**> 500**	**24%**	**BTEX, PHCs, Metals, VOCs, O&G, Glycols**
		4.42	Sand	25	< 1	
		5.17	**Silt**	**10**	**< 1**	**BTEX, PHCs**
		5.92	Silt	25	< 1	
		6.67	Silt	5	< 1	
		7.42	Silt	20	< 1	
		8.17	Silt/Clay	15	< 1	
		8.92	Silt/Clay	10	< 1	
		9.67	Silt	5	< 1	
		10.42	**Silt**	**165**	**1%**	**BTEX, PHCs**
PA-05	11/08/02	0.77	Silt	25	< 1	
		1.92	Sand	5	< 1	
		2.17	**Sand**	**50**	**< 1**	**Particle Size**
		2.92	Sand	30	< 1	
		3.67	**Sand**	**> 500**	**29%**	**BTEX, PHCs, Particle Size**
		4.42	Clay	475	4%	
		5.17	Clay	10	< 1	
		5.92	**Clay**	**35**	**< 1**	**BTEX, PHCs**
PA-06	11/08/03	0.77	Silt	25	< 1	
		1.92	Sand	25	< 1	
		2.17	Sand	15	< 1	
		2.92	Sand	20	< 1	
		3.67	**Sand**	**15**	**< 1**	**BTEX, PHCs**
		4.42	Clay	15	< 1	
		5.17	Silt	10	< 1	
		5.92	Silt	20	< 1	
PA-07	11/08/03	0.77	Silt	15	< 1	
		1.92	Silt	15	< 1	
		2.17	Sand	20	< 1	
		2.92	Sand	20	< 1	
		3.67	**Sand**	**> 500**	**19%**	**BTEX, PHCs**
		4.42	Silt	20	< 1	
		5.17	**Silt**	**25**	**< 1**	**BTEX, PHCs**
		5.92	Clay	10	< 1	

Table 2 - Combustible Organic Vapours in Soil
Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan - February 2012

Test Hole	Date of Drilling (yy/mm/dd)	Sample Depth (m)	Soil Type	Vapour Concentration (ppm)	Vapour Concentration (% LEL)	Lab Analyses
PA-08	11/08/03	0.77	Silt	25	< 1	
		1.92	Sand	15	< 1	
		2.17	Sand	35	< 1	
		2.92	Sand	30	< 1	
		3.67	**Sand**	**> 500**	**22%**	**BTEX, PHCs**
		4.42	**Clay**	**70**	**< 1**	**BTEX, PHCs**
		5.17	Silt	35	< 1	
		5.92	Clay	10	< 1	
PA-09	11/08/03	0.77	Sand /Gravel (fill)	5	< 1	
		1.92	Sand	15	< 1	
		2.17	Sand	20	< 1	
		2.92	Sand	25	< 1	
		3.67	**Sand**	**100**	**< 1**	**BTEX, PHCs**
		4.42	Clay	35	< 1	
		5.17	Silt	15	< 1	
		5.92	**Silt**	**25**	**< 1**	**BTEX, PHCs, Particle Size**
PA-10	11/08/03	0.77	Silt	10	< 1	
		1.92	Sand	15	< 1	
		2.17	Sand	15	< 1	
		2.92	**Sand**	**20**	**< 1**	**BTEX, PHCs**
		3.67	Sand	15	< 1	
		4.42	Sand	20	< 1	
		5.17	**Clay/Silt**	**30**	**< 1**	**BTEX, PHCs**
		5.92	Clay/Silt	20	< 1	
PA-11	11/08/02	**0.77**	**Silt**	**10**	**< 1**	**Metals, O&G, Glycols**
		1.92	Silt	5	< 1	
		2.17	Silt	5	< 1	
		2.92	**Sand**	**10**	**< 1**	**BTEX, PHCs, VOCs**
		3.67	Sand	5	< 1	
		4.42	Clay	5	< 1	
		5.17	Clay	10	< 1	
		5.92	Silt	5	< 1	
PA-12	11/08/02	0.77	Silt	30	< 1	
		1.92	Silt	20	< 1	
		2.17	Silt	20	< 1	
		2.92	**Sand**	**20**	**< 1**	**BTEX, PHCs**
		3.67	Sand	5	< 1	
		4.42	Silt	5	< 1	
		5.17	Clay	5	< 1	
		5.92	Clay	5	< 1	
PA-13	11/08/03	0.22	Silt	10	< 1	
		0.77	Silt	5	< 1	
		1.92	Silt	5	< 1	
		2.17	Sand	5	< 1	
		2.92	Sand	15	< 1	
		3.67	**Sand**	**> 500**	**6%**	**BTEX, PHCs**
		4.42	**Clay**	**225**	**2%**	**Metals, VOCs, O&G, Glycols, Particle Size**
		5.17	**Silt**	**25**	**< 1**	**BTEX, PHCs**
		5.92	Silt	10	< 1	
PA-14	11/08/03	0.77	Silt	15	< 1	
		1.92	Silt	15	< 1	
		2.17	Sand	10	< 1	
		2.92	**Sand**	**25**	**< 1**	**BTEX, PHCs**
		3.67	Sand	15	< 1	
		4.42	Clay	5	< 1	
		5.17	Clay	5	< 1	
		5.92	Silt	10	< 1	

Table 2 - Combustible Organic Vapours in Soil

Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262

190 Airport Road - Prince Albert, Saskatchewan - February 2012

Test Hole	Date of Drilling (yy/mm/dd)	Sample Depth (m)	Soil Type	Vapour Concentration (ppm)	Vapour Concentration (% LEL)	Lab Analyses
PA-15	11/08/03	**0.07**	**Silt**	**10**	**< 1**	**BTEX, PHCs**
		0.77	Silt	10	< 1	
		1.42	Silt	10	< 1	
		2.17	Sand	5	< 1	
PA-16	11/08/03	**0.07**	**Silt**	**20**	**< 1**	**BTEX, PHCs**
		0.77	Silt	20	< 1	
		1.42	Silt	15	< 1	
		2.17	Sand	10	< 1	
PA-17	11/08/03	0.77	Silt	15	< 1	
		1.92	Sand	20	< 1	
		2.17	Sand	15	< 1	
		2.92	**Sand**	**25**	**< 1**	**BTEX, PHCs**
		3.67	Sand	20	< 1	
		4.42	Silt	10	< 1	
		5.17	Silt	20	< 1	
		5.92	Clay	25	< 1	
PA-18	11/10/03	0.77	Silt	10	< 1	
		1.92	Sand	10	< 1	
		2.17	Sand	20	< 1	
		2.92	Sand	230	2	
		3.67	**Sand**	**> 500**	**8%**	**BTEX, PHCs**
		4.42	Silt	120	1%	
		5.17	**Clay**	**125**	**1%**	**BTEX, PHCs**
		5.92	Clay	35	< 1	
PA-19	11/10/03	0.77	Silt	10	< 1	
		1.92	Sand	10	< 1	
		2.17	Sand	15	< 1	
		2.92	Sand	10	< 1	
		3.67	**Sand**	**15**	**< 1**	**BTEX, PHCs, Particle Size**
		4.42	Sand	10	< 1	
		5.17	**Silt**	**5**	**< 1**	**BTEX, PHCs**
		5.92	Silt	5	< 1	
PA-20	11/10/03	0.77	Sand	10	< 1	
		1.92	Sand	15	< 1	
		2.17	Sand	10	< 1	
		2.92	**Sand**	**15**	**< 1**	**BTEX, PHCs**
		3.67	Sand	10	< 1	
		4.42	Clay	5	< 1	
		5.17	Clay	5	< 1	
		5.92	Silt	5	< 1	
PA-21	11/10/03	0.77	Silt	5	< 1	
		1.92	Sand	10	< 1	
		2.17	Sand	5	< 1	
		2.92	Sand	10	< 1	
		3.67	Sand	5	< 1	
		4.42	**Sand**	**15**	**< 1**	**BTEX, PHCs**
		5.17	Silt	5	< 1	
		5.92	Silt	5	< 1	

Notes:

1. ppm = parts per million
2. LEL = Lower Exposive Limit (below 5%, value is calculated from ppm reading)
3. All vapour readings were obtained with a Gastech Model 1238 Detector set with methane elimination on.
4. A shaded cell with bold white text indicates sample submitted for laboratory analysis.

Table 3 - Summary of Grain Size Analyses in Soil

Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262

190 Airport Road - Prince Albert, Saskatchewan - February 2012

	Sample Location, Date Sampled and Sample Depth					
Particle Size/Soil Classification	**PA-01/02-12 11/08/02-03 (8.92 m)**	**PA-05-3 11/08/02 (2.17 m)**	**PA-05-5 11/08/02 (3.67 m)**	**PA-09-8 11/08/03 (5.92 m)**	**PA-13-7 11/08/03 (4.42 m)**	**PA-19-5 11/10/03 (3.67 m)**
Percent Retained on the #200 Sieve (> 0.075 mm)	4.8	84	93	4.8	1.4	98
Percent Retained in the Pan (< 0.075 μm)	95	16	7.4	95	99	2.2
Grain Size Classification	Fine Grained	Coarse Grained	Coarse Grained	Fine Grained	Fine Grained	Coarse Grained
Field Soil Classification	Clay, some silt	Sand, fine grained	Sand, medium grained	Silt, some clay	Clay, some silt, fine sand	Sand, medium to coarse grained

Table 4 - Summary of Groundwater Monitoring Results
Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan - February 2012

		Well Location							
Parameter	**Date (yy/mm/dd)**	**PA-01**	**PA-02**	**PA-03**	**PA-04**	**PA-05**	**PA-06**	**PA-07**	**PA-08**
Ground Elevation (m)	11/08/04	99.905	99.905	99.847	99.815	99.855	99.769	99.859	99.739
Stick-Up PVC Well Casing (m)	11/08/04	-0.101	-0.095	-0.102	-0.089	-0.128	-0.117	-0.160	-0.087
PVC Well Collar Elevation (m)	11/08/04	99.804	99.810	99.745	99.726	99.727	99.652	99.699	99.652
Water Level (m below PVC Well Collar)	11/08/04	3.310	ND	3.116	3.025	3.150	2.988	3.062	3.251
	11/08/24	3.314	3.138	3.237	3.136	3.175	2.977	3.046	3.342
	11/10/04	3.572	--	3.370	--	3.513	3.061	3.123	3.508
Groundwater Elevation (m)	11/08/04	96.494	ND	96.629	96.701	96.577	96.664	96.637	96.401
	11/08/24	96.490	96.672	96.508	96.590	96.552	96.675	96.653	96.310
	11/10/04	96.232	--	96.375	--	96.214	96.591	96.576	96.144
LNAPL Thickness (m)	11/08/04	**0.225**	ND	**0.084**	ND	**0.105**	ND	ND	**0.298**
	11/08/24	**0.242**	ND	**0.244**	ND	**0.150**	ND	ND	**0.420**
	11/10/04	**0.408**	--	**0.247**	--	**0.417**	ND	ND	**0.476**
Combustible Organic Vapour (ppm)	11/08/05	160	> 500 (11%)	> 500 (9%)	> 500 (27%)	> 500 (4%)	35	210	> 500 (14%)
	11/08/24	160	> 500 (23%)	350	> 500 (10%)	115	75	85	160
	11/10/04	--	--	--	--	--	--	--	--

		Well Location							
Parameter	**Date (yy/mm/dd)**	**PA-09**	**PA-10**	**PA-11**	**PA-12**	**PA-13**	**PA-14**	**PA-17**	**PA-18**
Ground Elevation (m)	11/08/04	99.711	99.970	99.888	99.725	99.912	99.793	99.736	99.595
Stick-Up PVC Well Casing (m)	11/08/04	-0.092	-0.102	-0.079	-0.101	-0.095	-0.103	-0.097	-0.147
PVC Well Collar Elevation (m)	11/08/04	99.619	99.868	99.809	99.624	99.817	99.690	99.639	99.448
Water Level (m below PVC Well Collar)	11/08/04	2.923	3.156	3.078	2.889	3.101	2.996	3.035	--
	11/08/24	2.922	3.154	3.085	2.904	3.104	2.996	3.021	--
	11/10/04	3.029	3.265	3.212	3.024	3.215	3.095	3.096	2.988
Groundwater Elevation (m)	11/08/04	96.696	96.712	96.731	96.735	96.716	96.694	96.604	--
	11/08/24	96.697	96.714	96.724	96.720	96.713	96.694	96.618	--
	11/10/04	96.590	96.603	96.597	96.600	96.602	96.595	96.543	96.460
LNAPL Thickness (m)	11/08/04	ND	ND	ND	ND	**0.010**	ND	ND	--
	11/08/24	ND	ND	ND	ND	**0.004**	ND	ND	--
	11/10/04	ND	ND	ND	ND	**0.001**	ND	ND	**0.079**
Combustible Organic Vapour (ppm)	11/08/05	220	120	80	115	> 500 (8%)	135	45	--
	11/08/24	155	105	80	60	90	80	95	--
	11/10/04	--	--	--	--	--	--	--	> 500 (6%)

Table 4 - Summary of Groundwater Monitoring Results

Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262

190 Airport Road - Prince Albert, Saskatchewan - February 2012

		Well Location								
Parameter	**Date (yy/mm/dd)**	**PA-19**	**PA-20**	**PA-21**	**MWNW**	**MWSE**	**MW1**	**MW2**	**MW3**	**MW4**
Ground Elevation (m)	11/08/04	99.643	99.526	99.745	99.799	99.884	99.780	99.872	99.888	99.744
Stick-Up PVC Well Casing (m)	11/08/04	-0.131	-0.082	-0.107	0.211	-0.032	-0.102	-0.100	-0.161	-0.085
PVC Well Collar Elevation (m)	11/08/04	99.512	99.444	99.638	100.010	99.852	99.678	99.772	99.727	99.659
Water Level (m below PVC Well Collar)	10/10/02	--	--	--	3.847	--	3.141	3.375	3.220	3.117
	11/08/04	--	--	--	3.498	3.265	2.967	3.302	3.165	2.968
	11/08/24	--	--	--	3.531	3.293	2.966	3.335	3.163	2.929
	11/10/04	3.044	2.928	3.173	3.821	3.546	3.074	3.512	3.431	3.052
Groundwater Elevation (m)	10/10/02	--	--	--	96.163	--	96.537	96.397	96.507	96.542
	11/08/04	--	--	--	96.512	96.587	96.711	96.470	96.562	96.691
	11/08/24	--	--	--	96.479	96.559	96.712	96.437	96.564	96.730
	11/10/04	96.468	96.516	96.465	96.189	96.306	96.604	96.260	96.296	96.607
LNAPL Thickness (m)	10/10/02	--	--	--	**0.362**	--	ND	ND	ND	ND
	11/08/04	--	--	--	**0.189**	**0.118**	ND	**0.254**	**0.162**	**0.001**
	11/08/24	--	--	--	**0.241**	**0.159**	ND	**0.310**	**0.172**	ND
	11/10/04	ND	ND	ND	**0.447**	**0.329**	ND	**0.378**	**0.341**	ND
Combustible Organic Vapour (ppm)	10/10/02	--	--	--	--	--	--	--	--	--
	11/08/04	--	--	--	130	450	20	> 500 (13%)	5	160
	11/08/24	--	--	--	80	140	10	> 500 (12%)	165	30
	11/10/04	20	15	25	--	--	--	--	--	--

Notes:

1. “ND” indicates not detected.
2. "--" indicates not measured.
3. Water level measured from below the top of the PVC well collar.
4. Ground Elevations calculated based on level survey completed on August 4 and October 3, 2011. Benchmark - top of concrete slab SE corner of fuel dispensing stand = 100.000 m.
5. Shaded cell indicates presence of measurable LNAPL.
6. The 2010 data is from the Phase II ESA (KGS, 2011).

Table 5 - Summary of Field Chemistry Measurements in Groundwater
Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan - February 2012

Sample Location	Date (yy/mm/dd)	Parameter						
		Temperature (Celsius)	Conductivity (mS/cm)	Total Dissolved Solids (mg/L)	Dissolved Oxygen (mg/L)	pH (pH units)	Oxygen Reduction Potential (mV)	Turbidity (NTU)
PA-01	11/08/04	*Not Sampled - LNAPL Present*						
PA-02	11/08/24	*Not Sampled For Field Chemistry - Insufficient Water*						
PA-03	11/08/04	*Not Sampled - LNAPL Present*						
PA-04	11/08/04	*Not Sampled For Field Chemistry - Insufficient Water*						
PA-05	11/08/04	*Not Sampled - LNAPL Present*						
PA-06	11/08/04	8.92	1.282	1.183	8.38	5.69	+6.7	46.4
PA-07	11/08/04	6.96	0.994	0.966	2.24	6.08	-7.4	27.3
PA-08	11/08/04	*Not Sampled - LNAPL Present*						
PA-09	11/08/04	8.54	0.947	0.896	5.64	6.21	-0.6	42.1
PA-10	11/08/04	9.54	0.862	0.796	6.91	6.02	+1.1	35.2
PA-11	11/08/04	9.45	0.930	0.840	7.99	6.46	-4.6	24.4
PA-12	11/08/04	9.63	0.785	0.723	9.25	6.23	-1.7	11.8
PA-13	11/08/04	10.55	0.743	0.666	4.37	6.51	-17.3	52.3
PA-14	11/08/04	7.69	1.199	1.111	7.58	6.31	-0.5	12.0
PA-17	11/08/04	7.42	1.296	1.243	7.51	6.07	8.5	11.2
PA-18	11/10/04	*Not Sampled - LNAPL Present*						
PA-19	11/10/04	8.75	1.561	1.471	3.83	6.05	-7.9	63.9
PA-20	11/10/04	9.06	1.668	1.558	4.87	5.77	-6.4	28.1
PA-21	11/10/04	7.30	1.391	1.366	6.70	5.88	-5.1	28.5
MW1	11/08/04	9.60	0.779	0.717	7.90	6.64	-1.4	41.4
MW2	11/08/04	*Not Sampled - LNAPL Present*						
MW3	11/08/04	*Not Sampled - LNAPL Present*						
MW4	11/08/04	7.59	0.960	0.935	8.99	6.02	+3.1	24.6
MWNW	11/08/04	*Not Sampled - LNAPL Present*						
MWSE	11/08/04	*Not Sampled - LNAPL Present*						

Notes:

1. Temperature, conductivity, total dissolved solids, dissolved oxygen, pH and oxygen reduction potential measured using a YSI 556 Multi Probe meter.
2. Turbidity measured using a Hanna Instruments HI 98703 turbidimeter.

Table 6 - Summary of Petroleum Hydrocarbon Results in Soil
Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan - February 2012

Sample Location	Date (yy/mm/dd)	Sample Depth (m)	Vapour Concentration ppm (% LEL)	Parameter							
				Benzene	Toluene	Ethylbenzene	Xylenes	F1	F2	F3	F4
Fine Grained Surface Soil (< 1.5 m depth) - Commercial Land Use											
CCME CQEG [3] and CWS for PHC [4]				**0.28**	**330**	**430**	**230**	**320**	**260**	**2,500**	**6,600**
PA-15-1	11/08/03	0.07	10	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-16-1	11/08/03	0.07	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
Coarse Grained Subsoil (> 1.5 m depth) - Commercial Land Use											
CCME CQEG [3] and CWS for PHC [4]				**0.032**	**500**	**600**	**170**	**700**	**1,000**	**3,500**	**10,000**
PA-01/02-5	11/08/03	3.67	> 500 (32%)	**0.43**	8.2	9.8	93	**2,700**	**9,100**	< 10	< 10
PA-03/04-5	11/08/02	3.67	> 500 (24%)	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	**10,000**	< 10	< 10
PA-05-5	11/08/02	3.67	> 500 (29%)	**0.64**	8.5	8.8	83	**2,300**	**7,700**	< 10	< 10
PA-06-5	11/08/03	3.67	15	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-07-5	11/08/03	3.67	> 500 (19%)	< 0.0050	0.035	0.046	0.42	16	**3,500**	< 10	< 10
PA-08-5	11/08/03	3.67	> 500 (22%)	**0.034**	0.22	1.9	15	**760**	**2,800**	< 10	< 10
PA-09-5	11/08/03	3.67	100	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	100	< 10
PA-10-4	11/08/03	2.92	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-11-4	11/08/02	2.92	10	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-12-4	11/08/02	2.92	20	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-13-6	11/08/03	3.67	> 500 (6%)	< 0.0050	< 0.020	< 0.010	0.072	< 12	67	< 10	< 10
PA-14-4	11/08/03	2.92	25	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-17-4	11/08/03	2.92	25	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-18-5	11/10/03	3.67	> 500 (8%)	**0.30**	0.35	8.3	58	**1,400**	**7,400**	< 10	< 10
PA-19-5	11/10/03	3.67	15	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-20-4	11/10/03	2.92	15	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-21-6	11/10/03	4.42	15	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
MW1-S5	10/10/01	3.30	136	< 0.0050	< 0.050	< 0.010	0.46	20	118	< 50	< 50
MW2-S5	10/10/01	3.30	508	**0.059**	0.621	2.44	17.2	638	**1,840**	< 50	< 50
MW3-S6	10/10/01	4.25	628	**0.545**	23.4	13.5	111	**1,600**	**4,890**	< 50	< 50
MW4-S5	10/10/01	3.45	30.3	< 0.0050	< 0.050	< 0.010	< 0.10	< 10	< 30	< 50	< 50
TH5-S5	10/10/01	3.3	1034	**1.82**	55.7	33.6	**306**	**9,700**	**25,700**	348	< 50
TH6-S6	10/10/01	3.95	671	**0.313**	2.2	4.96	27.9	**1,060**	**3,980**	65	< 50
TH7-S5	10/10/01	3.30	25.6	< 0.0050	< 0.050	< 0.010	< 0.10	< 10	< 30	< 50	< 50
TH8-S5	10/10/01	3.30	22.7	< 0.0050	< 0.050	< 0.010	< 0.10	< 10	230	< 50	< 50
Fine Grained Subsoil (> 1.5 m depth) - Commercial Land Use											
CCME CQEG [3] and CWS for PHC [4]				**0.29**	**660**	**860**	**460**	**800**	**1,000**	**5,000**	**10,000**
PA-01/02-7	11/08/03	5.17	215	< 0.0050	0.057	0.069	0.66	21	< 10	28	< 10
PA-01/02-12	11/08/03	8.92	300	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	76	< 10
PA-03/04-7	11/08/02	5.17	10	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	95	< 10
PA-03/04-14	11/08/02	10.42	165	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-05-8	11/08/02	5.92	35	< 0.0050	0.042	0.055	0.49	< 12	180	17	< 10
PA-07-7	11/08/03	5.17	25	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-08-6	11/08/03	4.42	70	0.030	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-09-8	11/08/03	5.92	25	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-10-7	11/08/03	5.17	30	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	< 10	< 10
PA-13-7	11/08/03	4.42	225	< 0.006	< 0.020	< 0.010	< 0.040	--	--	--	--
PA-13-8	11/08/03	5.17	25	< 0.0050	< 0.020	< 0.010	0.14	28	86	< 10	< 10
PA-18-7	11/10/03	5.17	125	< 0.0050	< 0.020	0.013	0.10	< 12	< 10	130	42
PA-19-7	11/10/03	5.17	5	< 0.0050	< 0.020	< 0.010	< 0.040	< 12	< 10	44	< 10

Notes:

1. All concentrations expressed in milligrams per kilogram (mg/kg).
2. The symbol < indicates a concentration less than the noted laboratory method detection limit.
3. The symbol -- indicates not analyzed.
4. CCME CEQG = Canadian Environmental Quality Guidelines. Guidelines obtained November 2011 from web page: http://ceqg-rcqe.ccme.ca. 10^{-6} risk criteria used for benzene.
   Surface soil limiting pathways for fine grained soil: inhalation for benzene; and ecological soil contact for toluene, ethylbenzene, and xylenes.
   Subsoil limiting pathways for coarse grained soil: inhalation for benzene and xylenes; and ecological soil contact for ethylbenzene and toluene.
   Subsoil limiting pathways for fine grained soil: inhalation for benzene; and ecological soil contact for ethylbenzene, toluene and xylenes.
5. CCME CWS for PHC = Canada Wide Standard for Petroleum Hydrocarbons in Soil, January 2008.
   Surface soil limiting pathways for fine grained soil: ecological soil contact for PHC F1 to F4 Fractions.
   Subsoil limiting pathways for coarse and fine grained soil: management limits for PHC F1 to F4 Fractions.
6. A shaded cell with bold white text indicates value exceeds the referenced guideline value.
7. Analytical results from MW1 through TH8 are from the Phase II ESA (KGS, 2011).

Table 7 - Summary of Metal Results in Soil

Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262

190 Airport Road - Prince Albert, Saskatchewan - February 2012

		Sample Location, Date Sampled and Sample Depth		
Parameter	**CCME CEQG [(4)] Commercial HH / Env**	**PA-03/04-5 11/08/02 (3.67 m)**	**PA-11-1 11/08/02 (0.77 m)**	**PA-13-7 11/08/03 (4.42 m)**
Antimony	40	< 1	< 1	< 1
Arsenic	12 / 26	3	5	3
Barium	2000 / NG	63	150	46
Beryllium	8	< 0.4	< 0.4	< 0.4
Boron	NG	0.1	0.2	0.1
Cadmium	49 / 22	< 0.1	0.2	< 0.1
Chromium	630 / 87	6	15	5
Hex. Chromium	NG / 1.4	< 0.15	< 0.15	< 0.15
Cobalt	4000 / 91	4	6	4
Copper	1100 / 63	< 5	9	< 5
Lead	260 / 600	3	7	3
Mercury	24 / 50	< 0.05	< 0.05	0.12
Molybdenum	40	< 0.4	0.4	< 0.4
Nickel	NG / 50	8	18	8
Selenium	125 / 2.9	< 0.5	< 0.5	< 0.5
Silver	40	< 1	< 1	< 1
Thallium	1 / 3.6	< 0.3	< 0.3	< 0.3
Tin	300	< 1	< 1	< 1
Uranium	33 / 2000	< 1	< 1	< 1
Vanadium	NG / 130	10	23	9
Zinc	NG / 320	17	39	17

Notes:

1. All concentrations expressed in milligrams per kilogram (mg/kg).
2. The symbol < indicates a concentration less than the noted laboratory method detection limit.
3. "NG" indicates no guideline established.
4. CCME CEQG = Canadian Environmental Quality Guidelines. Guidelines obtained November 2011 from web page http://ceqg-rcqe.ccme.ca.

Table 8 - Summary of VOC Results in Soil
Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan - February 2012

		Sample Location, Date Sampled and Sample Depth		
Parameter	CCME CEQG (4) Commercial	PA-03/04-5 11/08/02 (3.67 m)	PA-11-4 11/08/02 (2.92 m)	PA-13-7 11/08/03 (4.42 m)
1,1,1,2-tetrachloroethane	NG	< 1	< 0.1	< 0.1
1,1,1-trichloroethane	50	< 0.2	< 0.02	< 0.02
1,1,2,2-tetrachloroethane	50	< 1	< 0.1	< 0.1
1,1,2-trichloroethane	50	< 0.2	< 0.02	< 0.02
1,1-dichloroethane	50	< 0.2	< 0.02	< 0.02
1,1-dichloroethene	50	< 0.2	< 0.02	< 0.02
1,2,3-trichlorobenzene	10	1.9	< 0.04	< 0.04
1,2,4-trichlorobenzene	10	1.0	< 0.04	< 0.04
1,2,4-trimethylbenzene	NG	170	< 0.6	< 0.6
1,2-dibromoethane	NG	< 0.2	< 0.002	< 0.002
1,2-dichlorobenzene	10	< 0.2	< 0.02	< 0.02
1,2-dichloroethane	50	< 0.2	< 0.02	< 0.02
1,2-dichloropropane	50	< 0.2	< 0.02	< 0.02
1,3,5-trichlorobenzene	10	0.6	< 0.04	< 0.04
1,3,5-trimethylbenzene	NG	40	< 0.6	< 0.6
1,3-dichlorobenzene	10	< 0.2	< 0.02	< 0.02
1,4-dichlorobenzene	10	< 0.2	< 0.02	< 0.02
Bromodichloromethane	NG	< 0.3	< 0.03	< 0.03
Bromoform	NG	< 0.6	< 0.06	< 0.06
Bromomethane	NG	< 0.2	< 0.02	< 0.02
Carbon tetrachloride	50	< 0.2	< 0.0005	< 0.0005
Chlorobenzene	10*	< 0.2	< 0.001	< 0.001
Chlorodibromomethane	NG	< 0.2	< 0.02	< 0.02
Chloroethane	NG	< 0.2	< 0.02	< 0.02
Chloroform	50	< 0.2	< 0.0008	< 0.0008
Chloromethane	NG	< 0.3	< 0.03	< 0.03
cis-1,2-dichloroethene	50	< 0.2	< 0.02	< 0.02
cis-1,3-dichloropropene	NG	< 0.2	< 0.02	< 0.02
Dichloromethane	50	0.3	0.04	0.04
Methyl methacrylate	NG	< 0.4	< 0.04	< 0.04
Methyl-tert-butylether (MTBE)	NG	< 0.3	< 0.03	< 0.03
Styrene	50	< 0.2	< 0.02	< 0.02
Tetrachloroethene (PCE)	0.5	< 0.2	< 0.02	< 0.02
trans-1,2-dichloroethene	50	< 0.2	< 0.02	< 0.02
trans-1,3-dichloropropene	NG	< 0.2	< 0.02	< 0.02
Trichloroethene (TCE)	0.01	< 0.1	< 0.01	< 0.01
Trichlorofluoromethane	NG	< 0.2	< 0.02	< 0.02
Vinyl chloride	NG	< 0.1	< 0.0003	< 0.0003

Notes:

1. All concentrations expressed in milligrams per kilogram (mg/kg).
2. The symbol < indicates a concentration less than the noted laboratory method detection limit.
3. “NG” indicates no guideline established.
4. CCME CEQG = Canadian Environmental Quality Guidelines. Guidelines obtained November 2011 from web page http://ceqg-rcqe.ccme.ca.
5. Results for benzene, toluene, ethylbenzene and xylenes that were analyzed in the VOC scan for these three samples are shown on Table 6.

Table 9 - Summary of Glycol and Oil/Grease Results in Soil
Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan - February 2012

		Sample Location, Date Sampled and Sample Depth		
Parameter	**CCME CEQG (4) Commercial HH / Env**	**PA-03/04-5 11/08/02 (3.67 m)**	**PA-11-1 11/08/02 (0.77 m)**	**PA-13-7 11/08/03 (4.42 m)**
Ethylene Glycol	NG / 960	< 10	< 10	< 10
Diethylene Glycol	NG	< 10	< 10	< 10
Triethylene Glycol	NG	< 10	< 10	< 10
Tetraethylene Glycol	NG	< 10	< 10	< 10
Propylene Glycol	NG	< 10	< 10	< 10
Oil and Grease	NG	12,000	< 50	< 50

Notes:

1. All concentrations expressed in milligrams per kilogram (mg/kg).
2. The symbol < indicates a concentration less than the noted laboratory method detection limit.
3. "NG" indicates no guideline established.
4. CCME CEQG = Canadian Environmental Quality Guidelines. Guidelines obtained November 2011 from web page http://ceqg-rcqe.ccme.ca.

Table 10 - Summary of LNAPL Analyses

Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262

190 Airport Road - Prince Albert, Saskatchewan - February 2012

Sample Location	Date (yy/mm/dd)	Parameter							
		Benzene	Toluene	Ethylbenzene	Xylenes	F1	F2	F3	F4
HC-CGDWQ (4)		**0.005 (MAC)**	**0.024 (AO)**	**0.0024 (AO)**	**0.3 (AO)**	**NG**	**NG**	**NG**	**NG**
FCSAP FIGQG (5)		**1.8 (inhalation)**	**200 (soil contact)**	**110 (soil contact)**	**48 (inhalation)**	**9.1 (inhalation)**	**3.1 (soil contact)**	**NG**	**NG**
PA-08-P	11/08/04	29	550	630	8,900	170,000	11,000	< 10	< 10
MW2-P	11/08/04	40	810	1,200	12,000	250,000	11,000	16	< 10
MWSE-P	11/08/04	57	110	110	13,000	270,000	10,000	< 10	< 10
UST-P	11/08/04	34	400	630	3,600	150,000	11,000	< 10	< 10
MWNW-P	10/10/02	--	--	--	--	--	796,020	12,230	< 300

Notes:

1. All concentrations expressed in milligrams per litre (mg/L).
2. The symbol < indicates a concentration less than the noted laboratory method detection limit.
3. The symbol -- indicates not analyzed.
4. HC-GCDWQ = Health Canada Guidelines for Canadian Drinking Water Quality, Summary Table, May 2008. MAC = Maximum Acceptable Concentration, AO = Aesthetic Objective. Provided for reference only.
5. FCSAP FIGQG = Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites, May 2010. Provided for reference only.
6. The 2010 data is from the Phase II ESA (KGS, 2011).

Table 11 - Summary of Petroleum Hydrocarbon Results in Groundwater
Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan - February 2012

Sample Location	Date (yy/mm/dd)	Parameter							
		Benzene	Toluene	Ethylbenzene	Xylenes	F1	F2	F3	F4
HC-CGDWQ [(3)]		**0.005 (MAC)**	**0.024 (AO)**	**0.0024 (AO)**	**0.3 (AO)**	**NG**	**NG**	**NG**	**NG**
FCSAP FIGQG [(4)]		**1.8 (inhalation)**	**200 (soil contact)**	**110 (soil contact)**	**48 (inhalation)**	**9.1 (inhalation)**	**3.1 (soil contact)**	**NG**	**NG**
PA-01	11/08/04	***Not Sampled - LNAPL Present***							
PA-02	11/08/24	0.014	0.075	0.031	0.29	0.58	1.0	< 0.1	< 0.1
PA-03	11/08/04	***Not Sampled - LNAPL Present***							
PA-04	11/08/04	0.0006	0.0048	0.0049	0.057	< 0.1	1.0	< 0.1	< 0.1
PA-05	11/08/04	***Not Sampled - LNAPL Present***							
PA-06	11/08/04	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1
PA-07	11/08/04	0.056	0.16	0.14	1.2	1.5	**13**	0.3	< 0.1
PA-08	11/08/04	***Not Sampled - LNAPL Present***							
PA-09	11/08/04	0.0006	0.0055	0.0095	0.095	0.21	0.1	< 0.1	< 0.1
PA-10	11/08/04	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1
PA-11	11/08/04	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1
PA-12	11/08/04	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1
PA-13	11/08/04	0.096	0.49	0.2	1.9	1.0	**12**	< 0.1	< 0.1
PA-14	11/08/04	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1
PA-17	11/08/04	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1
PA-18	11/10/03	***Not Sampled - LNAPL Present***							
PA-19	11/10/03	0.012	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1
PA-20	11/10/03	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1
PA-21	11/10/03	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1
MW1	10/10/02	0.00301	0.0674	0.0389	0.6	0.84	**7.27**	< 0.3	< 0.3
	11/08/04	< 0.0004	0.0011	< 0.0004	0.049	< 0.1	0.9	< 0.1	< 0.1
MW2	10/10/02	0.0999	0.389	0.17	1.84	2.08	**39.2**	0.84	< 0.3
	11/08/04	***Not Sampled - LNAPL Present***							
MW3	10/10/02	0.29	0.765	0.163	2.11	4.65	**194**	2.45	< 0.3
	11/08/04	***Not Sampled - LNAPL Present***							
MW4	10/10/02	< 0.00050	< 0.00075	< 0.00050	< 0.002	< 0.2	< 0.2	< 0.3	< 0.3
	11/08/04	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1
MWNW	10/10/02	***Not Sampled - LNAPL Present***							
	11/08/04	***Not Sampled - LNAPL Present***							
MWSE	10/10/02	--	--	--	--	--	--	--	--
	11/08/04	***Not Sampled - LNAPL Present***							

Notes:

1. All concentrations expressed in milligrams per litre (mg/L).
2. The symbol < indicates a concentration less than the noted laboratory method detection limit.
3. HC-GCDWQ = Health Canada Guidelines for Canadian Drinking Water Quality, Summary Table, May 2008. MAC = Maximum Acceptable Concentration, AO = Aesthetic Objective. Provided for reference only.
4. FCSAP FIGQG = Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites, May 2010.
5. A shaded cell with bold white text indicates value exceeds the referenced FCSAP FIGQG guideline value. A lighter shaded cell with black text indicates value exceeded the HC-GCDWQ guideline.
6. The 2010 data is from the Phase II ESA (KGS, 2011).

Table 12 - Summary of Metal Results in Groundwater

Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262

190 Airport Road - Prince Albert, Saskatchewan - February 2012

		Sample Location and Date Sampled		
Parameter	**HC-GCDWQ [4]**	**PA-03 11/08/04**	**PA-04 11/08/04**	**PA-11 11/08/04**
Aluminum	0.1	0.055	0.10	0.043
Antimony	0.006	< 0.0006	< 0.0006	< 0.0006
Arsenic	0.01	0.0012	0.0047	< 0.0002
Barium	1	0.38	0.04	0.31
Beryllium	NG	< 0.01	< 0.001	< 0.001
Boron	5	0.04	0.40	0.03
Cadmium	0.005	0.00035	0.000046	0.000013
Calcium	NG	96	150	71
Chromium	0.05	< 0.001	< 0.001	< 0.001
Cobalt	NG	0.010	0.0021	0.0005
Copper	1	0.0031	0.0013	0.0010
Iron	0.3	0.20	< 0.06	< 0.06
Lead	0.01	0.0014	< 0.0002	0.0004
Lithium	NG	0.02	0.16	0.03
Magnesium	NG	33	37	37
Manganese	0.05	**2.6**	**0.57**	**0.10**
Molybdenum	NG	0.022	0.010	0.0030
Nickel	NG	0.013	0.0064	0.0020
Phosphorus	NG	< 0.1	< 0.1	< 0.1
Potassium	NG	11	5.3	1.8
Selenium	0.01	< 0.0002	0.0003	0.0007
Silicon	NG	11	8.4	7.9
Silver	NG	< 0.0001	< 0.0001	< 0.0001
Sodium	200	22	110	5.7
Strontium	NG	0.62	1.1	0.58
Sulphur	NG	3.6	88	3.6
Thallium	NG	< 0.0002	< 0.0002	< 0.0002
Tin	NG	< 0.001	< 0.001	< 0.001
Titanium	NG	< 0.001	0.005	0.002
Uranium	0.02	0.0003	0.0054	0.0012
Vanadium	NG	< 0.001	< 0.001	< 0.001
Zinc	5	0.009	0.005	< 0.003

Notes:

1. All concentrations expressed in milligrams per litre (mg/L).
2. The symbol < indicates a concentration less than the noted laboratory method detection limit.
3. “NG” indicates no guideline established.
4. HC-GCDWQ = Health Canada - Guidelines for Canadian Drinking Water Quality Summary Table, May 2008. Provided for reference only.
5. A shaded cell with bold white text indicates value exceeds the referenced HC-GCDWQ guideline value.

Table 13 - Summary of VOC Results in Groundwater

Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262

190 Airport Road - Prince Albert, Saskatchewan - February 2012

			Sample Location and Date Sampled	
Parameter	FCSAP (4) FIGQG	HC-GCDWQ (5)	PA-04 11/08/04	PA-11 11/08/04
1,1,1,2-tetrachloroethane	0.006 (inhalation)	NG	< 0.002	< 0.002
1,1,1-trichloroethane	NG	NG	< 0.0005	< 0.0005
1,1,2,2-tetrachloroethane	0.022 (inhalation)	NG	< 0.002	< 0.002
1,1,2-trichloroethane	NG	NG	< 0.0005	< 0.0005
1,1-dichloroethane	9 (inhalation)	NG	< 0.0005	< 0.0005
1,1-dichloroethene	0.49 (inhalation)	NG	< 0.0005	< 0.0005
1,2,3-trichlorobenzene	NG	NG	< 0.001	< 0.001
1,2,4-trichlorobenzene	NG	NG	< 0.001	< 0.001
1,2,4-trimethylbenzene	NG	NG	0.028	< 0.0005
1,2-dibromoethane	NG	NG	< 0.0005	< 0.0005
1,2-dichlorobenzene	NG	0.003 (AO)	< 0.0005	< 0.0005
1,2-dichloroethane	NG	0.005 (MAC)	< 0.0005	< 0.0005
1,2-dichloropropane	0.0093 (inhalation)	NG	< 0.0005	< 0.0005
1,3,5-trichlorobenzene	0.15 (inhalation)	NG	< 0.0005	< 0.0005
1,3,5-trimethylbenzene	NG	NG	0.0079	< 0.0005
1,3-dichlorobenzene	NG	NG	< 0.0005	< 0.0005
1,4-dichlorobenzene	NG	0.001 (AO)	< 0.0005	< 0.0005
Bromodichloromethane	NG	0.016 (MAC)	< 0.0005	< 0.0005
Bromoform	0.84 (inhalation)	NG	< 0.0005	< 0.0005
Bromomethane	0.002 (inhalation)	NG	< 0.002	< 0.002
Carbon tetrachloride	0.0068 (inhalation)	0.005 (MAC)	< 0.0005	< 0.0005
Chlorobenzene	NG	0.03 (AO)	< 0.0005	< 0.0005
Chlorodibromomethane	NG	NG	< 0.001	< 0.001
Chloroethane	NG	NG	< 0.001	< 0.001
Chloroform	NG	NG	< 0.0005	< 0.0005
Chloromethane	NG	NG	0.004	< 0.002
cis-1,2-dichloroethene	NG	NG	< 0.0005	< 0.0005
cis-1,3-dichloropropene	0.0038 (inhalation)	NG	< 0.0005	< 0.0005
Dichloromethane	NG	0.05 (MAC)	< 0.002	< 0.002
Methyl methacrylate	10 (inhalation)	NG	< 0.0005	< 0.0005
Methyl-tert-butylether (MTBE)	4.3 (inhalation)	0.015 (AO)	< 0.0005	< 0.0005
Styrene	NG	NG	< 0.001	< 0.001
Tetrachloroethene (PCE)	NG	0.03 (MAC)	< 0.0005	< 0.0005
trans-1,2-dichloroethene	NG	NG	< 0.0005	< 0.0005
trans-1,3-dichloropropene	0.0038 (inhalation)	NG	< 0.0005	< 0.0005
Trichloroethene (TCE)	NG	0.005 (MAC)	< 0.0005	< 0.0005
Trichlorofluoromethane	NG	NG	< 0.0005	< 0.0005
Trihalomethanes (total)	NG	0.100 (MAC)	< 0.002	< 0.002
Vinyl chloride	0.013 (inhalation)	0.002 (MAC)	< 0.0005	< 0.0005

Notes:

1. All concentrations expressed in milligrams per litre (mg/L).
2. The symbol < indicates a concentration less than the noted laboratory method detection limit.
3. "NG" indicates no guideline established.
4. FCSAP FIGQG = Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites, May 2010.
5. HC-GCDWQ = Health Canada - Guidelines for Canadian Drinking Water Quality Summary Table, May 2008. Provided for reference only.
   MAC = Maximum Acceptable Concentration, AO = Aesthetic Objective.

Table 14 - Summary of Glycol and Oil/Grease Results in Groundwater
Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan - February 2012

			Sample Location and Date Sampled		
Parameter	FCSAP (5) FIGQG	HC-GCDWQ (6)	PA-03 11/08/04	PA-04 11/08/04	PA-11 11/08/04
Ethylene Glycol	16,000	NG	< 10	< 10	< 10
Diethylene Glycol	NG	NG	< 5	< 5	< 5
Triethylene Glycol	NG	NG	< 10	< 10	< 10
Tetraethylene Glycol	NG	NG	< 10	< 10	< 10
Propylene Glycol	NG	NG	< 10	< 10	< 10
Oil and Grease	NG	NG	--	3	< 2

Notes:

1. All concentrations expressed in milligrams per litre (mg/L).
2. The symbol < indicates a concentration less than the noted laboratory method detection limit.
3. The symbol -- indicates not analyzed.
4. "NG" indicates no guideline established.
5. FCSAP FIGQG = Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites, May 2010.
6. HC-GCDWQ = Health Canada - Guidelines for Canadian Drinking Water Quality Summary Table, May 2008. Provided for reference only.

Table 15 - Relative Percent Difference - Duplicate Soil Samples - BTEX and PHCs

Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262

190 Airport Road - Prince Albert, Saskatchewan - February 2012

		Sample Location and Date Sampled			
	Parameter	PA-08-5 11/08/03	BD1 (Duplicate) 11/08/03	Relative Percent Difference	Average RPD (Detectable Values)
PHCs	Benzene	0.034	0.058	52.2	22.7
	Toluene	0.22	0.27	20.4	
	Ethylbenzene	1.9	1.7	11.1	
	Xylenes	15	14	6.9	
	PHC F1 Fraction	760	640	17.1	
	PHC F2 Fraction	2,800	2,100	28.6	
	PHC F3 Fraction	< 10	< 10	N/A	
	PHC F4 Fraction	< 10	< 10	N/A	
	Parameter	PA-09-5 11/08/03	BD2 (Duplicate) 11/08/03	Relative Percent Difference	Average RPD (Detectable Values)
PHCs	Benzene	< 0.0050	< 0.0050	N/A	N/A
	Toluene	< 0.020	< 0.020	N/A	
	Ethylbenzene	< 0.010	< 0.010	N/A	
	Xylenes	< 0.040	< 0.040	N/A	
	PHC F1 Fraction	< 12	< 12	N/A	
	PHC F2 Fraction	< 10	< 10	N/A	
	PHC F3 Fraction	100	< 10	N/A	
	PHC F4 Fraction	< 10	< 10	N/A	
	Parameter	PA-18-5 11/10/03	PA-BD1 (Duplicate) 11/10/03	Relative Percent Difference	Average RPD (Detectable Values)
PHCs	Benzene	0.30	0.35	15.4	6.5
	Toluene	0.35	0.35	0.0	
	Ethylbenzene	8.3	8.5	2.4	
	Xylenes	58	55	5.3	
	PHC F1 Fraction	1,400	1,400	0.0	
	PHC F2 Fraction	7,400	6,300	16.1	
	PHC F3 Fraction	< 10	< 10	N/A	
	PHC F4 Fraction	< 10	< 10	N/A	

Notes:

1. All concentrations expressed in milligrams per kilogram (mg/kg).
2. The symbol < indicates a concentration less than the laboratory method detection limit.
3. The symbol n/a indicates RPD can not be calculated

Table 16 - Relative Percent Difference - Duplicate Soil Sample - Metals, VOCs, Glycols and O&G

Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262

190 Airport Road - Prince Albert, Saskatchewan - February 2012

		Sample Location and Date Sampled			
	Parameter	PA-03/04-5 11/08/02	BD3 (Duplicate) 11/08/02	Relative Percent Difference	Average RPD (Detectable Values)
Metals	Antimony	< 1	< 1	N/A	6.3
	Arsenic	3	3	0.0	
	Barium	63	54	15.4	
	Beryllium	< 0.4	< 0.4	N/A	
	Boron	0.1	< 0.1	N/A	
	Cadmium	< 0.1	< 0.1	N/A	
	Chromium	6	5	18.2	
	Hex. Chromium	< 0.15	< 0.15	N/A	
	Cobalt	4	4	0.0	
	Copper	< 5	< 5	N/A	
	Lead	3	3	0.0	
	Mercury	< 0.05	< 0.05	N/A	
	Molybdenum	< 0.4	< 0.4	N/A	
	Nickel	8	8	0.0	
	Selenium	< 0.5	< 0.5	N/A	
	Silver	< 1	< 1	N/A	
	Thallium	< 0.3	< 0.3	N/A	
	Tin	< 1	< 1	N/A	
	Uranium	< 1	< 1	N/A	
	Vanadium	10	9	10.5	
	Zinc	17	16	6.1	
VOCs	1,1,1,2-tetrachloroethane	< 1	< 2	N/A	23.6
	1,1,1-trichloroethane	< 0.2	< 0.4	N/A	
	1,1,2,2-tetrachloroethane	< 1	< 2	N/A	
	1,1,2-trichloroethane	< 0.2	< 0.4	N/A	
	1,1-dichloroethane	< 0.2	< 0.4	N/A	
	1,1-dichloroethene	< 0.2	< 0.4	N/A	
	1,2,3-trichlorobenzene	1.9	< 0.9	N/A	
	1,2,4-trichlorobenzene	1.0	< 0.9	N/A	
	1,2,4-trimethylbenzene	170	210	21.1	
	1,2-dibromoethane	< 0.2	< 0.4	N/A	
	1,2-dichlorobenzene	< 0.2	< 0.4	N/A	
	1,2-dichloroethane	< 0.2	< 0.4	N/A	
	1,2-dichloropropane	< 0.2	< 0.4	N/A	
	1,3,5-trichlorobenzene	0.6	< 0.9	N/A	
	1,3,5-trimethylbenzene	40	52	26.1	
	1,3-dichlorobenzene	< 0.2	< 0.4	N/A	
	1,4-dichlorobenzene	< 0.2	< 0.4	N/A	
	Benzene	< 0.0050	0.3	N/A	
	Bromodichloromethane	< 0.3	< 0.7	N/A	
	Bromoform	< 0.6	< 1	N/A	
	Bromomethane	< 0.2	< 0.4	N/A	
	Carbon tetrachloride	< 0.2	< 0.4	N/A	
	Chlorobenzene	< 0.2	< 0.4	N/A	
	Chlorodibromomethane	< 0.2	< 0.4	N/A	
	Chloroethane	< 0.2	< 0.4	N/A	
	Chloroform	< 0.2	< 0.4	N/A	
	Chloromethane	< 0.3	< 0.7	N/A	
	cis-1,2-dichloroethene	< 0.2	< 0.4	N/A	
	cis-1,3-dichloropropene	< 0.2	< 0.4	N/A	
	Dichloromethane	0.3	< 0.2	N/A	
	Ethylbenzene	< 0.010	11	N/A	
	Methyl methacrylate	< 0.4	< 0.9	N/A	
	Methyl-tert-butylether (MTBE)	< 0.3	< 0.7	N/A	
	Styrene	< 0.2	< 0.4	N/A	
	Tetrachloroethene (PCE)	< 0.2	< 0.4	N/A	
	Toluene	< 0.020	7.9	N/A	
	trans-1,2-dichloroethene	< 0.2	< 0.4	N/A	
	trans-1,3-dichloropropene	< 0.2	< 0.4	N/A	
	Trichloroethene (TCE)	< 0.1	< 0.2	N/A	
	Trichlorofluoromethane	< 0.2	< 0.4	N/A	
	Xylenes	< 0.040	130	N/A	
	Vinyl chloride	< 0.1	< 0.2	N/A	
Glycols, O&G	Ethylene Glycol	< 10	< 10	N/A	28.6
	Diethylene Glycol	< 10	< 10	N/A	
	Triethylene Glycol	< 10	< 10	N/A	
	Tetraethylene Glycol	< 10	< 10	N/A	
	Propylene Glycol	< 10	< 10	N/A	
	Oil and Grease	12,000	16,000	28.6	

Notes:

1. All concentrations expressed in milligrams per kilogram (mg/kg).
2. The symbol < indicates a concentration less than the laboratory method detection limit.
3. The symbol n/a indicates RPD can not be calculated

Table 17 - Relative Percent Difference - Duplicate Groundwater Samples - BTEX and PHCs
Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan - February 2012

		Sample Location and Date Sampled			
	Parameter	PA-04 11/08/04	BDW1 (Duplicate) 11/08/04	Relative Percent Difference	Average RPD (Detectable Values)
PHCs	Benzene	0.0006	0.0007	15.4	14.3
	Toluene	0.0048	0.0046	4.3	
	Ethylbenzene	0.0049	0.0037	27.9	
	Xylenes	0.057	0.043	28.0	
	PHC F1 Fraction	< 0.1	< 0.1	N/A	
	PHC F2 Fraction	1.0	0.9	10.5	
	PHC F3 Fraction	< 0.1	< 0.1	N/A	
	PHC F4 Fraction	< 0.1	< 0.1	N/A	
	Parameter	PA-07 11/08/04	BDW2 (Duplicate) 11/08/04	Relative Percent Difference	Average RPD (Detectable Values)
PHCs	Benzene	0.056	0.083	38.8	25.9
	Toluene	0.16	0.23	35.9	
	Ethylbenzene	0.14	0.19	30.3	
	Xylenes	1.2	1.6	28.6	
	PHC F1 Fraction	1.5	1.0	40.0	
	PHC F2 Fraction	13	14	7.4	
	PHC F3 Fraction	0.3	0.3	0.0	
	PHC F4 Fraction	< 0.1	< 0.1	N/A	
	Parameter	PA-19 11/10/03	PA-BDW2 (Duplicate) 11/10/03	Relative Percent Difference	Average RPD (Detectable Values)
PHCs	Benzene	0.012	0.013	8.0	8.0
	Toluene	< 0.0004	< 0.0004	N/A	
	Ethylbenzene	< 0.0004	< 0.0004	N/A	
	Xylenes	< 0.0008	< 0.0008	N/A	
	PHC F1 Fraction	< 0.1	< 0.1	N/A	
	PHC F2 Fraction	< 0.1	< 0.1	N/A	
	PHC F3 Fraction	< 0.1	< 0.1	N/A	
	PHC F4 Fraction	< 0.1	< 0.1	N/A	

Notes:

1. All concentrations expressed in milligrams per litre (mg/L).
2. The symbol < indicates a concentration less than the laboratory method detection limit.
3. The symbol n/a indicates RPD can not be calculated

Table 18 - Relative Percent Difference - Duplicate Groundwater Sample - Metals, VOCs, Glycols and O&G
Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan - February 2012

		Sample Location and Date Sampled			
	Parameter	PA-04 11/08/04	BDW1 (Duplicate) 11/08/04	Relative Percent Difference	Average RPD (Detectable Values)
Metals	Aluminum	0.10	0.075	N/A	4.5
	Antimony	< 0.0006	< 0.0006	N/A	
	Arsenic	0.0047	0.0045	4.3	
	Barium	0.04	0.04	0.0	
	Beryllium	< 0.001	< 0.001	N/A	
	Boron	0.40	0.39	2.5	
	Cadmium	0.000046	0.000048	4.3	
	Calcium	150	140	6.9	
	Chromium	< 0.001	< 0.001	N/A	
	Cobalt	0.0021	0.0020	4.9	
	Copper	0.0013	0.0008	47.6	
	Iron	< 0.06	< 0.06	N/A	
	Lead	< 0.0002	0.0005	N/A	
	Lithium	0.16	0.16	0.0	
	Magnesium	37	36	2.7	
	Manganese	0.57	0.55	3.6	
	Molybdenum	0.010	0.010	0.0	
	Nickel	0.0064	0.0062	3.2	
	Phosphorus	< 0.1	< 0.1	N/A	
	Potassium	5.3	5.2	1.9	
	Selenium	0.0003	0.0003	0.0	
	Silicon	8.4	8.2	2.4	
	Silver	< 0.0001	< 0.0001	N/A	
	Sodium	110	110	0.0	
	Strontium	1.1	1.0	9.5	
	Sulphur	88	86	2.3	
	Thallium	< 0.0002	< 0.0002	N/A	
	Tin	< 0.001	< 0.001	N/A	
	Titanium	0.005	0.005	0.0	
	Uranium	0.0054	0.0053	1.9	
	Vanadium	< 0.001	< 0.001	N/A	
	Zinc	0.005	0.005	0.0	
VOCs	1,1,1,2-tetrachloroethane	< 0.002	< 0.002	N/A	26.0
	1,1,1-trichloroethane	< 0.0005	< 0.0005	N/A	
	1,1,2,2-tetrachloroethane	< 0.002	< 0.002	N/A	
	1,1,2-trichloroethane	< 0.0005	< 0.0005	N/A	
	1,1-dichloroethane	< 0.0005	< 0.0005	N/A	
	1,1-dichloroethene	< 0.0005	< 0.0005	N/A	
	1,2,3-trichlorobenzene	< 0.001	< 0.001	N/A	
	1,2,4-trichlorobenzene	< 0.001	< 0.001	N/A	
	1,2,4-trimethylbenzene	0.028	0.020	33.3	
	1,2-dibromoethane	< 0.0005	< 0.0005	N/A	
	1,2-dichlorobenzene	< 0.0005	< 0.0005	N/A	
	1,2-dichloroethane	< 0.0005	< 0.0005	N/A	
	1,2-dichloropropane	< 0.0005	< 0.0005	N/A	
	1,3,5-trichlorobenzene	< 0.0005	< 0.0005	N/A	
	1,3,5-trimethylbenzene	0.0079	0.0063	22.5	
	1,3-dichlorobenzene	< 0.0005	< 0.0005	N/A	
	1,4-dichlorobenzene	< 0.0005	< 0.0005	N/A	
	Bromodichloromethane	< 0.0005	< 0.0005	N/A	
	Bromoform	< 0.0005	< 0.0005	N/A	
	Bromomethane	< 0.002	< 0.002	N/A	
	Carbon tetrachloride	< 0.0005	< 0.0005	N/A	
	Chlorobenzene	< 0.0005	< 0.0005	N/A	
	Chlorodibromomethane	< 0.001	< 0.001	N/A	
	Chloroethane	< 0.001	< 0.001	N/A	
	Chloroform	< 0.0005	< 0.0005	N/A	
	Chloromethane	0.004	0.005	22.2	
	cis-1,2-dichloroethene	< 0.0005	< 0.0005	N/A	
	cis-1,3-dichloropropene	< 0.0005	< 0.0005	N/A	
	Dichloromethane	< 0.002	< 0.002	N/A	
	Methyl methacrylate	< 0.0005	< 0.0005	N/A	
	Methyl-tert-butylether (MTBE)	< 0.0005	< 0.0005	N/A	
	Styrene	< 0.001	< 0.001	N/A	
	Tetrachloroethene (PCE)	< 0.0005	< 0.0005	N/A	
	trans-1,2-dichloroethene	< 0.0005	< 0.0005	N/A	
	trans-1,3-dichloropropene	< 0.0005	< 0.0005	N/A	
	Trichloroethene (TCE)	< 0.0005	< 0.0005	N/A	
	Trichlorofluoromethane	< 0.0005	< 0.0005	N/A	
	Trihalomethanes (total)	< 0.002	< 0.002	N/A	
	Vinyl chloride	< 0.0005	< 0.0005	N/A	
Glycols	Ethylene Glycol	< 10	< 10	N/A	50.0
	Diethylene Glycol	< 5	< 5	N/A	
	Triethylene Glycol	< 10	< 10	N/A	
	Tetraethylene Glycol	< 10	< 10	N/A	
	Propylene Glycol	< 10	< 10	N/A	
	Oil and Grease	3	5	50.0	

Notes:

1. All concentrations expressed in milligrams per litre (mg/L).
2. The symbol < indicates a concentration less than the laboratory method detection limit.
3. The symbol n/a indicates RPD can not be calculated

Table 19 - Summary of Petroleum Hydrocarbon Results in Field and Trip Blanks
Phase III ESA - RCMP Hangar - DFRP 14477 - PR F/266 - BU F/262
190 Airport Road - Prince Albert, Saskatchewan - February 2012

Sample Location	Date (yy/mm/dd)	Parameter							
		Benzene	Toluene	Ethylbenzene	Xylenes	F1	F2	F3	F4
HC-CGDWQ [3]		0.005 (MAC)	0.024 (AO)	0.0024 (AO)	0.3 (AO)	NG	NG	NG	NG
FCSAP FIGQG [4]		1.8 (inhalation)	200 (soil contact)	110 (soil contact)	48 (inhalation)	9.1 (inhalation)	3.1 (soil contact)	NG	NG
PA-FB (Field Blank)	11/08/04	< 0.0004	0.0012	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1
TB-PA (Trip Blank)	11/08/24	< 0.0004	< 0.0004	< 0.0004	< 0.0008	< 0.1	< 0.1	< 0.1	< 0.1

Notes:

1. All concentrations expressed in milligrams per litre (mg/L).
2. The symbol < indicates a concentration less than the noted laboratory method detection limit.
3. HC-GCDWQ = Health Canada Guidelines for Canadian Drinking Water Quality, Summary Table, May 2008. MAC = Maximum Acceptable Concentration, AO = Aesthetic Objective. Provided for reference only.
4. FCSAP FIGQG = Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites, May 2010.

FIGURES

8.5" x 11"

PLOT: 12/18/11 11:12:15 PM

EGE FILE NAME: PWGSC-0125 036 01-Figure 1.dwg

EGE

Public Works & Government Services Canada

RCMP Hangar - 190 Airport Road, Prince Albert, SK

Phase III Environmental Site Assesment

Location Plan

Figure 01

8.5" x 11"
PLOT: 12/19/11 12:39:20 AM
EGE FILE NAME: PWGSC-0125 036 01-Figure 2.dwg

EGE

Public Works & Government Services Canada
RCMP Hangar - 190 Airport Road, Prince Albert, SK
Phase III Environmental Site Assesment

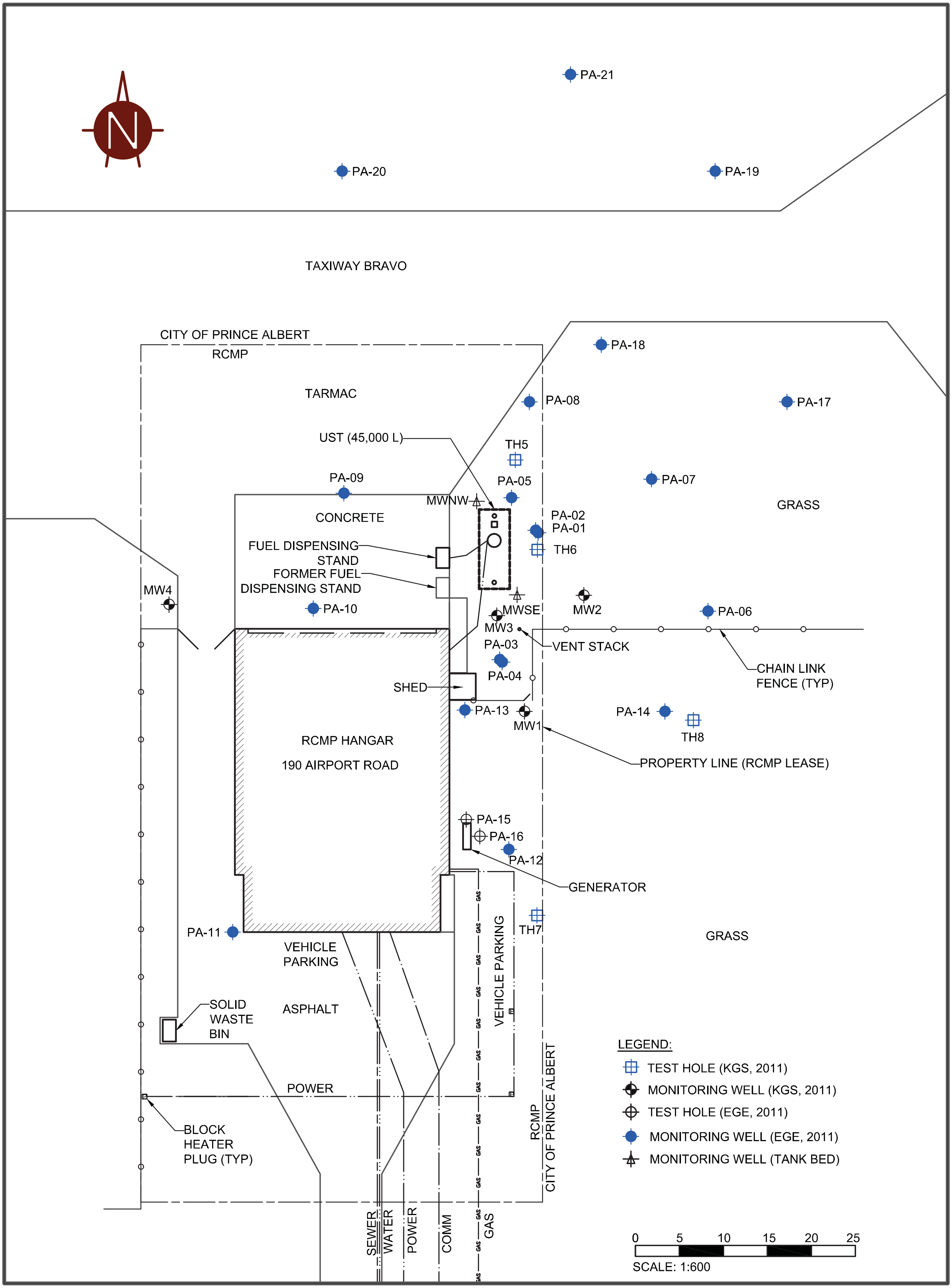
Surrounding Land Use

Figure 02

8.5" x 11"

PLOT: 2/20/12 6:08:42 PM

EGE FILE NAME: PWGSC-0125 036 01-Prince Albert Hanger- Figure 03-Site Plan.dwg



EGE

Public Works & Government Services Canada

RCMP Hangar - 190 Airport Road, Prince Albert, SK

Phase III Environmental Site Assesment

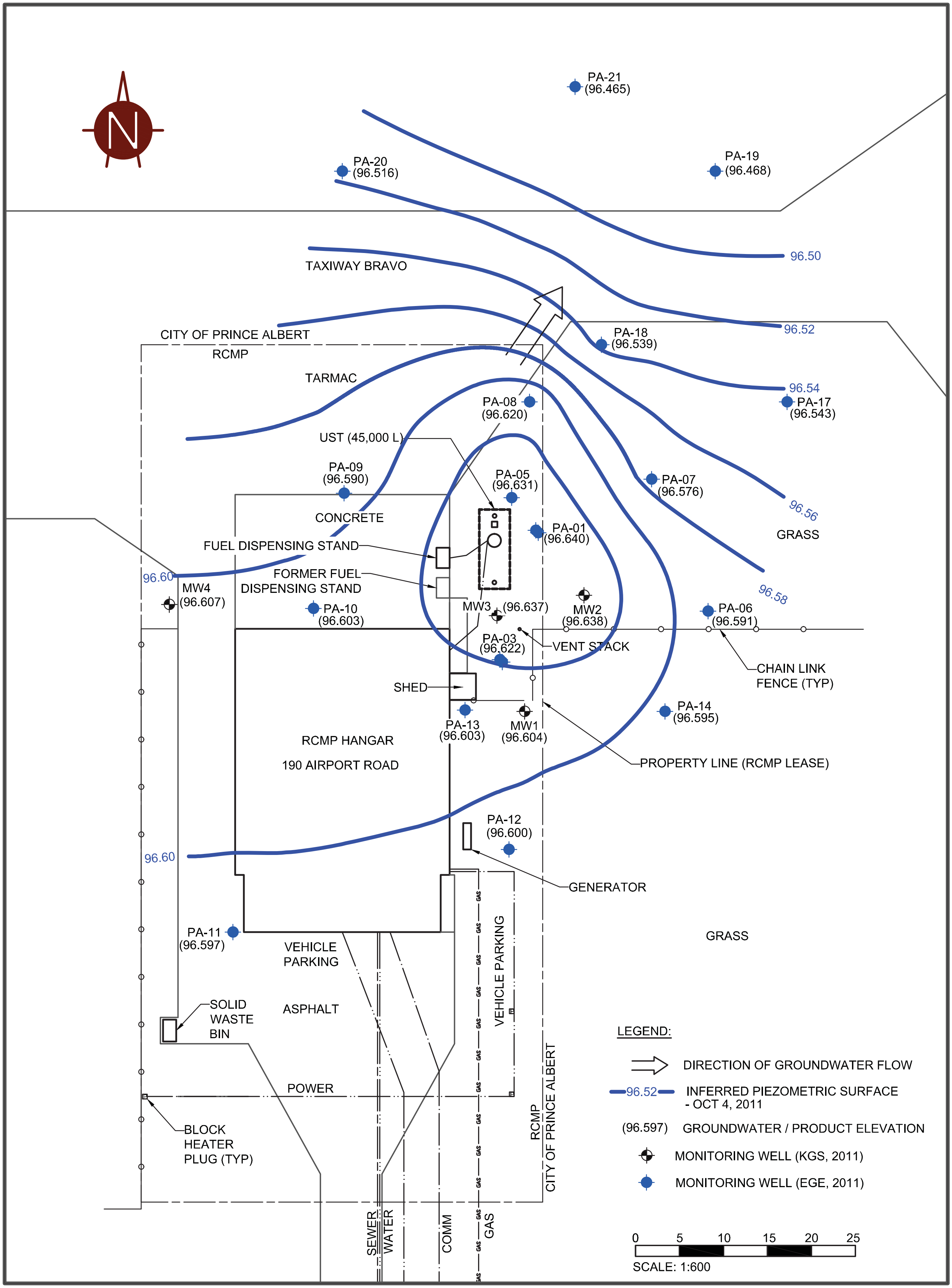
Site Plan

Figure 03

8.5" x 11"

PLOT: 2/20/12 6:43:25 PM

EGE FILE NAME: PWGSC-0125 036 01-Prince Albert Hanger- Figure 04-Piezometric Surface.dwg



EGE

Public Works & Government Services Canada

RCMP Hangar - 190 Airport Road, Prince Albert, SK

Phase III Environmental Site Assesment

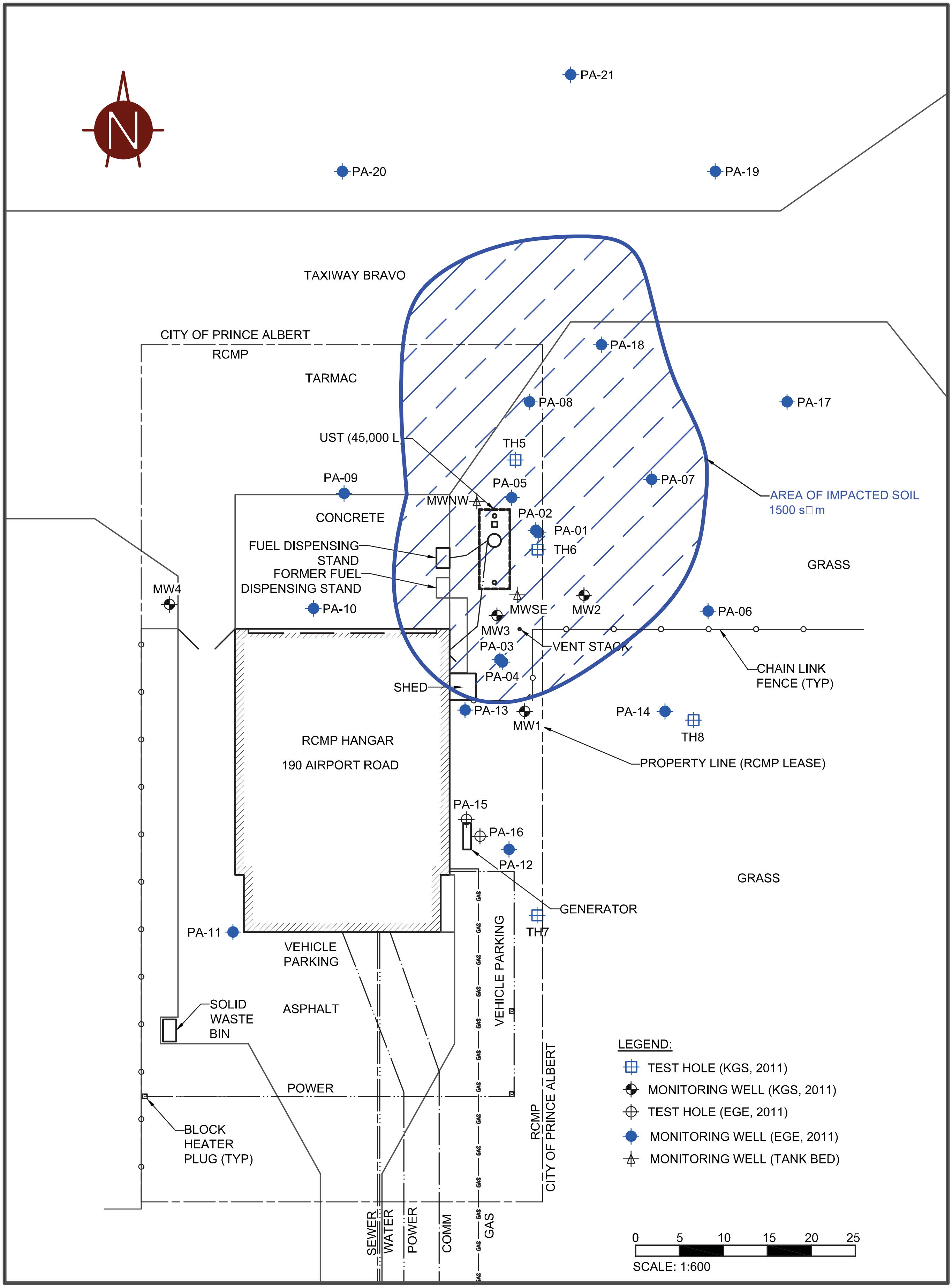
Piezometric Surface

Figure 04

8.5" x 11"

PLOT: 2/20/12 6:55:14 PM

EGE FILE NAME: PWGSC-0125 036 01-Prince Albert Hanger- Figure 05-Area of Impacted Soil.dwg



EGE

Public Works & Government Services Canada

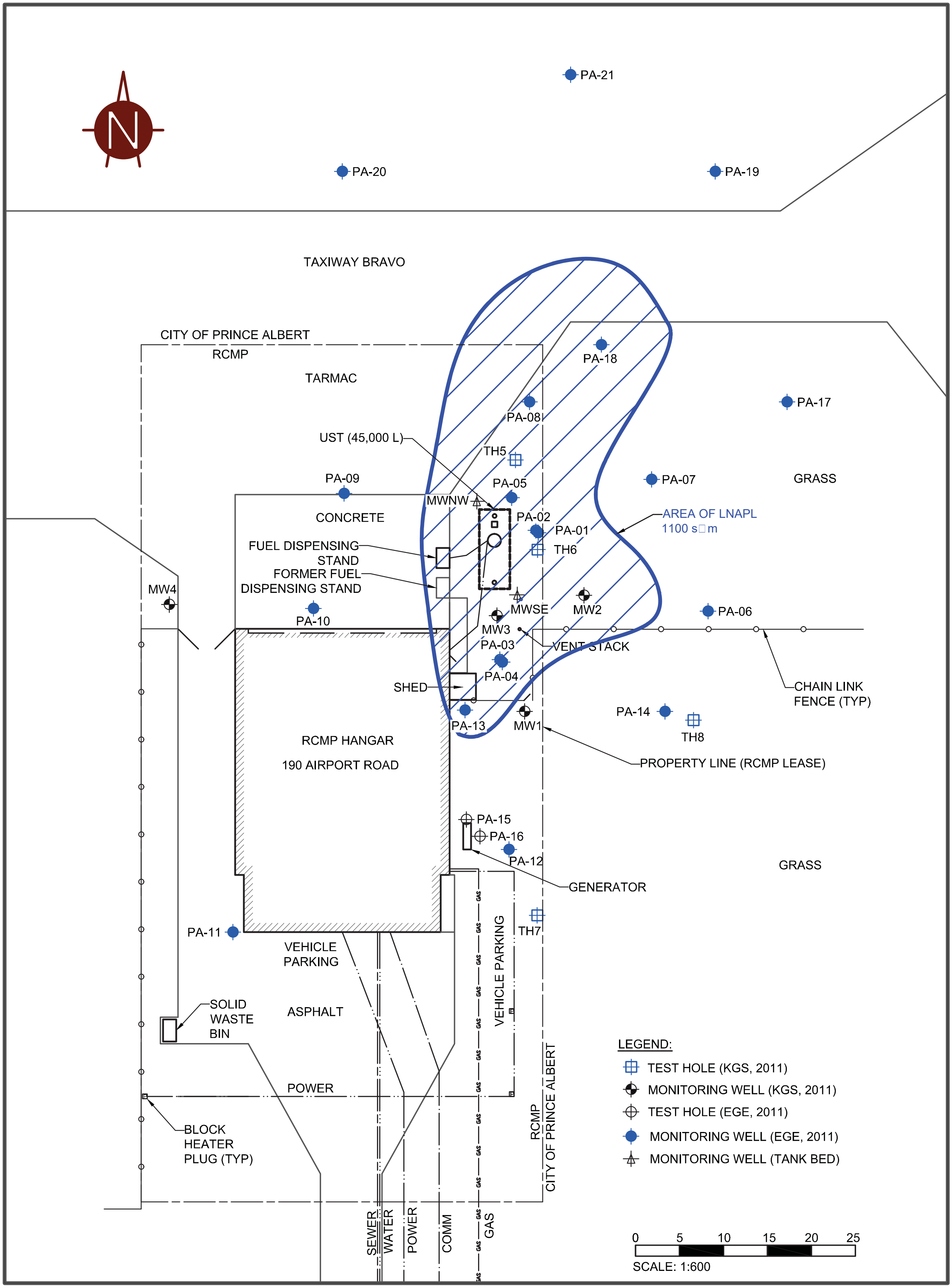
RCMP Hangar - 190 Airport Road, Prince Albert, SK

Phase III Environmental Site Assesment

Impacted Soil

Figure 05

8.5" x 11"
PLOT: 2/20/12 6:11:27 PM
EGE FILE NAME: PWGSC-0125 036 01-Prince Albert Hanger- Figure 06-Area of Free Product.dwg



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Public Works & Government Services Canada

RCMP Hangar - 190 Airport Road, Prince Albert, SK

Phase III Environmental Site Assesment

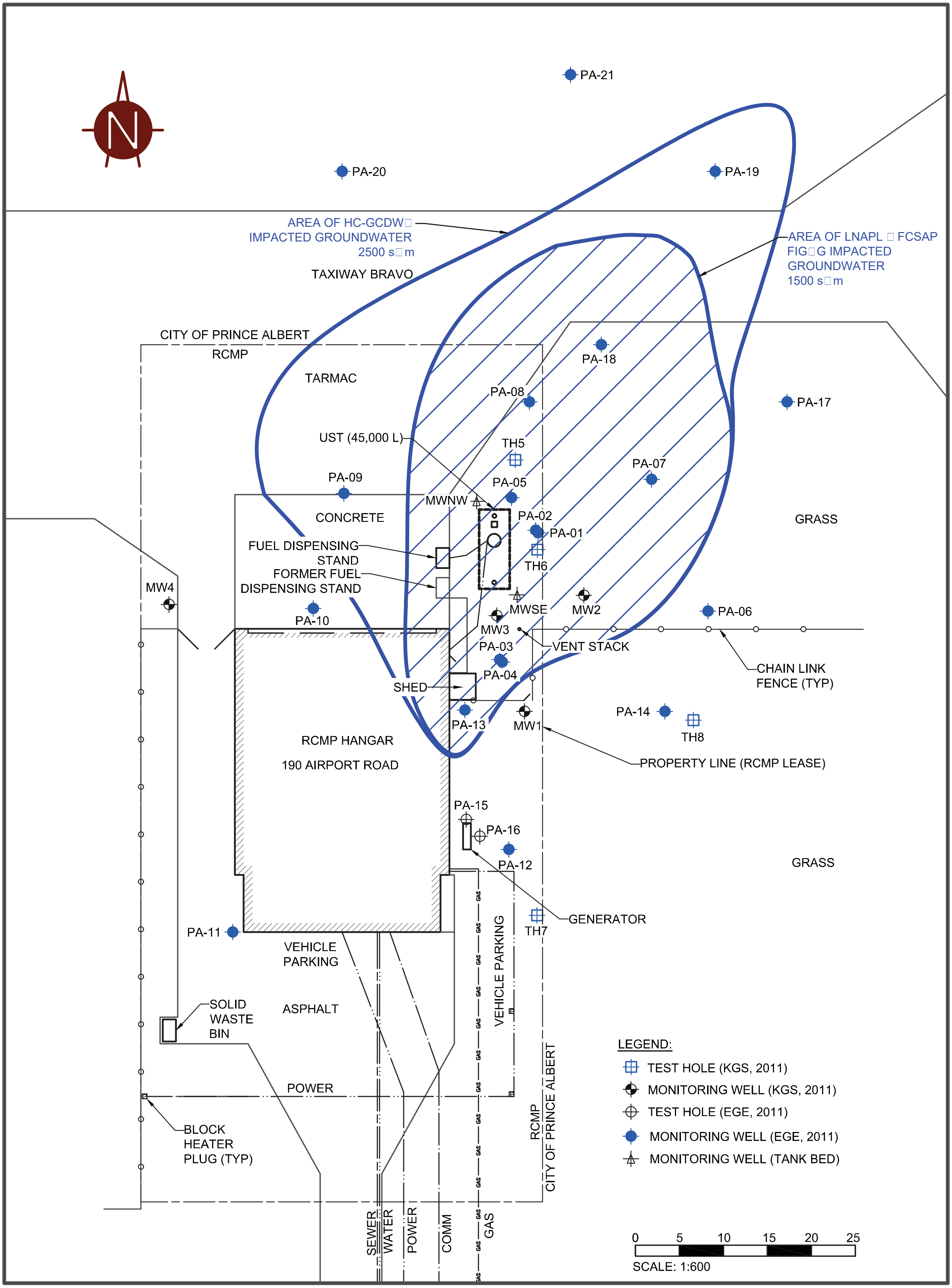
Area of LNAPL

Figure 06

EGE FILE NAME: PWGSC-0125 036 01-Prince Albert Hanger- Figure 07-Area of Impacted Groundwater.dwg

PLOT: 2/20/12 6:26:07 PM

8.5" x 11"



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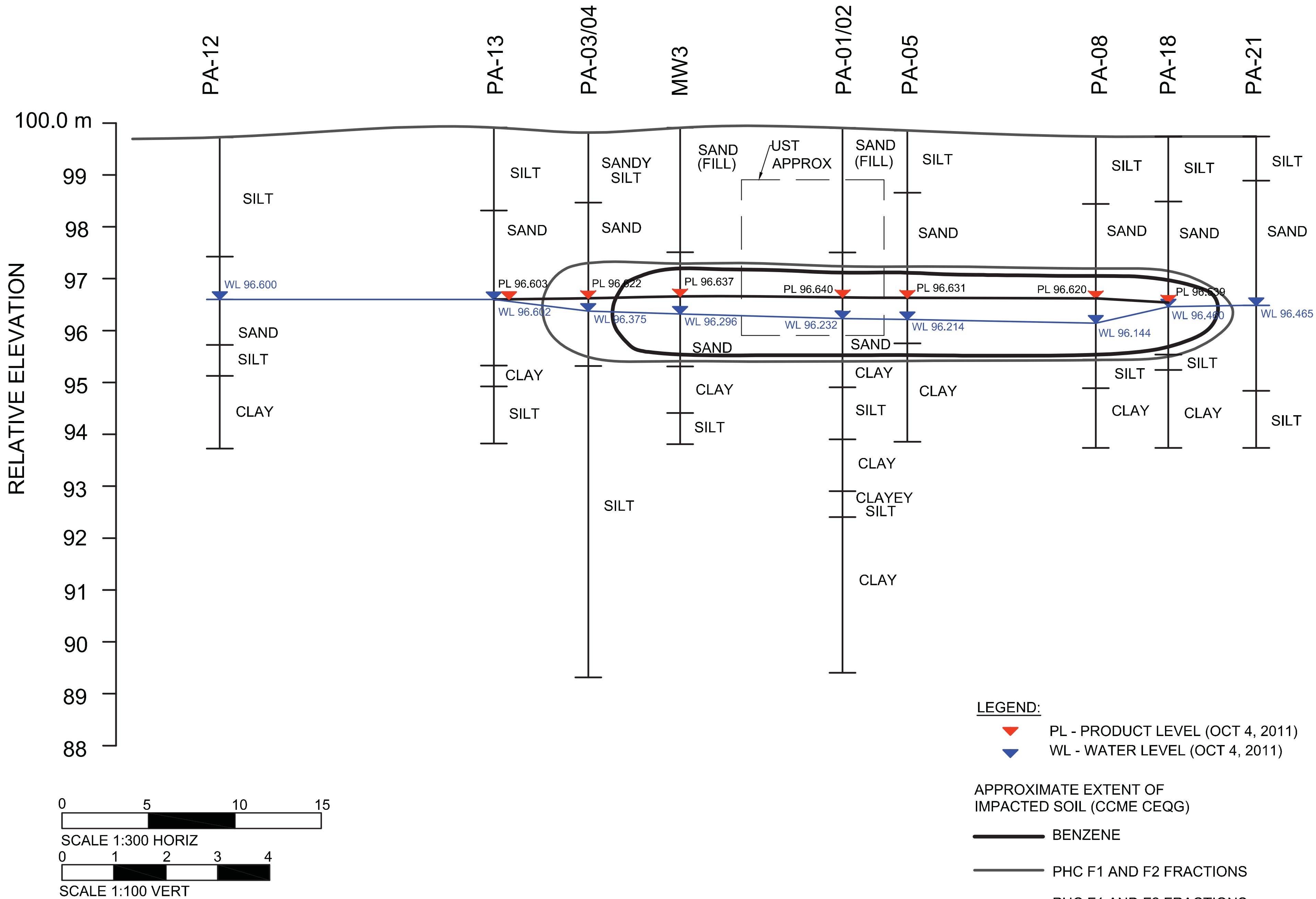
Public Works & Government Services Canada

RCMP Hanger - 190 Airport Road, Prince Albert, SK

Phase III Environmental Site Assesment

Impacted Groundwater

Figure 07



EGE

Public Works & Government Services Canada

RCMP Hangar - 190 Airport Road, Prince Albert, SK

Phase III Environmental Site Assesment

Cross Section A - A'

Figure 08

APPENDIX A

UTILITY CLEARANCES

Andrew

From: Karen Anthony [KAnthony@citypa.com]
Sent: July-27-11 12:07 PM
To: 'Andrew Passalis'
Subject: RE: Sewer/Water locates at 190 Airport Road, PA

Hi Andrew

I have received confirmation from the Collection/Distribution Manager that the locates have been done. Let me know if you require anything further. If you do require someone to meet your staff on site on August 2nd, please call the main office number at 953-4900 and ask to speak to Randy Antoniuk, Collection/Distribution Manager.

K. Anthony
Public Works Department
City of Prince Albert
1084 Central Avenue
Prince Albert, SK. S6V 7P3
(306) 953-4901 Ph. (306) 953-4915 Fax

There is no need for temples, no need for complicated philosophies. My brain and my heart are my temples; my philosophy is kindness."

- Dalai Lama

From: Andrew Passalis [mailto:andrew.passalis@mymts.net]
Sent: Monday, July 25, 2011 10:53 AM
To: Karen Anthony
Subject: Sewer/Water locates at 190 Airport Road, PA

Hi Karen

Further to our discussion regarding locates at the RCMP Hangar, I have attached a site plan illustrating the location of our proposed test hole locations.

Please let me know if there are any conflicting locations or you require any additional information.

Regards,

Andrew Passalis, P.Eng.
Project Engineer

EGE Engineering Ltd.
Engineering, Geosciences and Environmental
511 Pepperloaf Crescent
Winnipeg, Manitoba
R3R 1E6

Ph:(204) 791-4938

Header Code: **ROUTINE LOCATE**

Ticket No: 2011400130

'ATTENTION CONTRACTOR' PLEASE REMOVE LOCATE FLAGS UPON COMPLETION OF EXCAVATION

Work Planned for: Wed, 09/28/2011 09:28 AM
Locate to be completed by: Wed, 09/28/2011 09:28 AM
Original Call Date: Mon, 09/26/2011 09:28 AM

Contractor: EGE ENGINEERING LTD.
Contact Name: ANDREW PASSALIS
Alt. Contact: DAVID KLASSEN
Working for: PUBLIC WORKS & GOVERNMENT SERVICES CANADA

Contact Phone: (204)-791-4938 ext.
Contact Fax: (204)-837-6473 ext.
Alt Contact Phone: (204)-612-0944 ext.
Contact Cell (204)-791-4938 ext.
apassalis@mts.net
Subdivision:

City: PRINCE ALBERT
Address: 190 To: AIRPORT ROAD
Nearest Intersecting Street: HIGHWAY 55

Add. Dig Info: W110926063124OSEE ATTACHED TELDIG MAP, 4 TEST HOLES LOCATED ON AIRSIDE NEAR JUNCTION OF TAXIWAY BRAVO & MAIN APRON (SEE ATTACHED LOCATION PLAN) CONTRACT ANDREW ONCE COMPLETE.

BACK LOT, CONTACT CALLER TO CONFIRM LOC COMPLETE,

Type Of Work: TEST HOLES
Locator: TAYLOR, GEORGE

Remarks to excavator: ***** NOT CLEAR TO DIG OUTSIDE WORK AREA *****

NO TEL OR POWER IN WORK AREA CONTACTED CONTRACTOR

Locate Info:

SASKTEL - LA2 METRO Status: No Fac 2 Uti Completed: 09/27/2011 08:41:13 Notes:.
SASKPOWER - LA2 METRO Status: No Fac 2 Uti Completed: 09/27/2011 08:41:13 Notes:.

ANY CONCERNS OR QUESTIONS REGARDING THIS LOCATE, PLEASE CONTACT THE LOCATING SERVICES DEPARTEMENT AT 877-955-8131 OR BY EMAIL AT locates@magnaelectric.com.

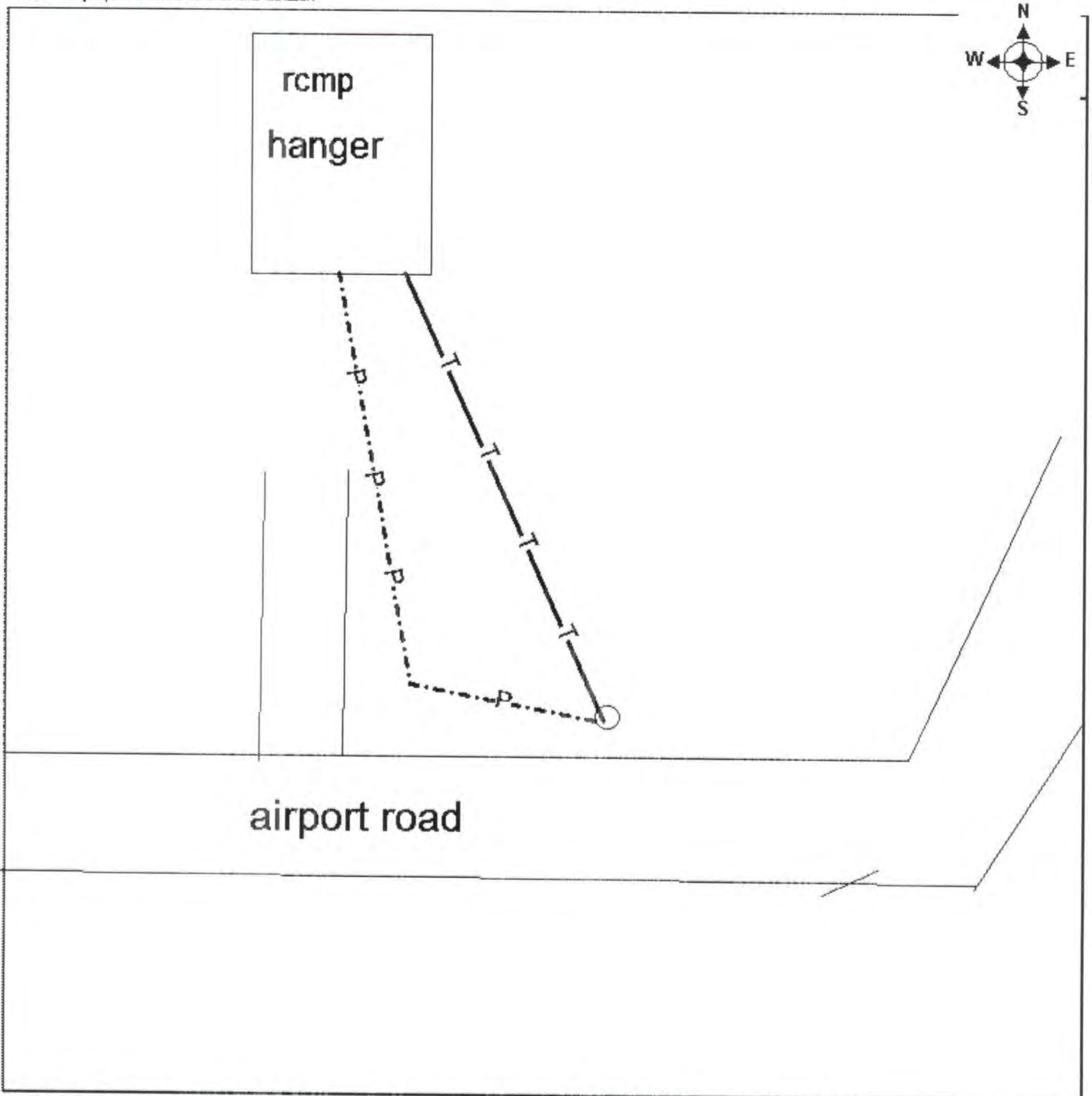
SaskTel SaskEnergy SaskPower

Locate Sketch

Method of marking lines: Flags [X] Paint [X] Stakes [ ]

Ticket No: 2011293517

Sketch of proposed excavation/Plant location



Sketch is for illustration purpose only. Not to scale. Refer to actual stakes and markings for location (s).

Legend: SaskTel ___T___ (solid line) SaskEnergy ___G___ (dashed line) SaskPower ___P___ (dashed and dotted line)

Always call for re-locate if it appears markings have been disturbed or become unclear, call 1st Call: 1-866-828-4888.
Surface markings color code: SaskTel: Orange SaskEnergy: Yellow SaskPower: Red

Date: 07/18/2011 12:20:21 Customer Contacted: Yes [X] No [ ] How Contacted: Phone [ ] Door Tag [ ] Record of Locate [ ]

This record provides a general understanding between all parties respecting underground facilities in proposed dig zone.
This receipt acknowledges receipt of the advice herein, and accepts and agrees to the terms and conditions as set out on the reverse.

(2010-12)

TERMS AND CONDITIONS

Wherever used herein, Utility refers to SaskEnergy/SaskTel/SaskPower and any employees or agents of the Utility/Utilities.
You, by signing the front of this Record of Locate, acknowledge that you are the owner, or an authorized agent for the owner of the location(s) of the excavation ("You") and You agree as follows:

1 The Utility/Utilities shall not be liable for any claims, damages, costs, liability, damage to property, or injury or death arising from, or caused by the work or excavation, or failure to abide by the location advice or any other terms or conditions provided herein;
2 You agree to indemnify the Utility, its successors and assigns, from and against all causes of action, claims, damages, costs, liability, demands, damage to property, and injury or death which may be alleged, claimed or brought against the Utility/Utilities by You, your heirs, successors, assigns, employees, contractors, invitees, or by any other third party, in respect or arising out of the work or excavation, or failure to abide by the location advice or any other terms or conditions provided herein;
3 You are responsible to provide supervision services in respect of any work or excavation, unless it is otherwise indicated herein that the Utility/Utilities shall provide same, in which case You are responsible to arrange for same with the Utility/Utilities as outlined herein;
4 You shall immediately upon demand reimburse the Utility for any losses, claims, costs, or damages to the facilities of the Utility caused by or arising out of the work or excavation, or failure to abide by the located advice or any other terms or conditions provided herein;

INSTRUCTIONS:

1 The project owner must provided accurate information on the scope of work and determines the starting and end points.
2 The excavator or the locator may request a pre-excavating meeting at the jobsite just prior to the actual marking of facility locations. Such pre-excavating meetings can be important for major, or unusual, excavations.
3 A visual inspection of the site shall be completed during the facility locating process by both the excavator and the locator. The locator can refer to the Corporation's facility drawings to determine the location of the facilities in the vicinity of the proposed excavation.
4 The located area is properly established and identified on the Record of Locate Form.
5 Stakes and markings are provided only for the work area specified by you.
6 <u>Ticket life is 10 working days from the date the locate was performed as noted on the Record of Locate Form.</u>
7 If work has not started within ten working days after the locate is completed by the Utility/Utilities, you must again notify Sask 1st Call to re-locate the work area and provide an updated facilities locate.
8 The excavator, where practical, protects and preserves the staking, marking or other designations for underground facilities until no longer required for proper and safe excavation. <u>Do not proceed if the stakes or marks have become obliterated or are displaced</u>. The excavator shall call Sask 1st call to <u>request a re-locate</u> when excavation continues past the life of the ticket.
9 From the start of the excavation and until work and backfilling is completed, you must take every precaution to ensure that no damage will result to the lines, their coatings, protective wrapping or cathodic protection devices and no stress will be applied to the lines.
10 Do not move lines or other installations, dangerous conditions may result at this or other locations.
11 When backfilling, ensure that the cables or pipes will remain in their original position during settlement by thoroughly compacting the backfill under them and keeping them supported. Ensure proper soil is used for backfill, ensure no sharp objects.
12 The Utilities only locate facilities that they own and have no knowledge of or responsibilities for locating facilities owned by others, including customer secondary lines or pipes.
13 Customer is responsible to remove stakes, pin flags or markings upon completion of work.
14 The location marking of buried facilities shall follow the international color code.
15 Multiple facilities in a "joint use" trench and/or corridor are marked individually and with corridor markers if applicable.
16 Do not excavate (including digging, boring, pushing, ploughing, or trenching the ground) without first day lighting to expose lines at a number of locations sufficient to determine their exact position and depth. If any location appears not to coincide with the marking or stake, contact <u>Sask 1st Call to request a re-locate of the location.</u>
17 When excavation is to take place within the Utility's specified tolerance/safety corridor, the excavator exercises such reasonable care as may be necessary for the protection of any underground facility in or near the excavation area. Methods to consider, based on certain climate or geographical conditions, include: hand digging when practical or other methods with the approval of the facility owner/operator. <u>Always dig by hand when you are within 1 meter of the underground facility.</u>
18 <u>The excavator uses reasonable care to avoid damaging underground facilities. An excavator discovering of causing damage to underground facilities notifies the utility/utilities. All breaks, leaks, nicks, dents, gouges, or other damage to facility line coatings or cathodic protection will be reported.</u>
19 The Utility/Utilities have the right to request that they inspect the exposed cable or pipe for damage or safety hazards. Do not attempt to locate lines by probing the ground with any pointed tool or object.

<u>If you damage our underground facilities, please call immediately</u>; SaskEnergy – 1-888-700-0427, SaskTel – 611, SaskPower – 310-2220.

<u>In the event of a natural gas leak</u>, you must do the following:

- **Notify all persons in the area or any premises that may be affected**
- **Keep traffic and pedestrians out of the area, take steps to protect the health and safety of any worker**
- **Do not backfill any damaged facilities until the damage has been inspected by the Utility and has authorized the backfill. <u>Leaking natural gas must be allowed to dissipate into the air.</u>**

Header Code: **ROUTINE LOCATE**

Ticket No: 2011293517

MAGNA ELECTRIC CORPORATION

'ATTENTION CONTRACTOR' PLEASE REMOVE LOCATE FLAGS UPON COMPLETION OF EXCAVATION

Work Planned for: Tue, 19/07/2011 16:25 PM
Locate to be completed by: Tue, 19/07/2011 16:25 PM
Original Call Date: Fri, 15/07/2011 16:25 PM

Contractor: EGE ENGINEERING LTD.
Contact Name: ANDREW PASSALIS
Alt. Contact: DAVID KLASSEN
Working for: PUBLIC WORKS & GOVERNMENT SERVICES CANADA

Contact Phone: (204)-791-4938 ext:
Contact Fax:
Alt Contact Phone: (204)-612-0944 ext
Contact Cell: (204)-791-4938 ext.
APASSALIS@MTS.NET

City: PRINCE ALBERT
Address: 190 AIRPORT ROAD
Nearest Intersecting Street: HIGHWAY 55

Subdivision:

Add. Dig Info: W1107151345000 TEST HOLES TO BE DRILLED ON SW CORNER, N SIDE AND WEST SIDE OF PROPERTY (RCMP HANGAR). PLEASE CALL TO CONFIRM LOCATE DATE AND RESULTS.

SIDE.FRONT LOT.BACK LOT.CONTACT CALLER TO CONFIRM LOC COMPLETE.

Type Of Work: TEST HOLES
Locator: TAYLOR, GEORGE

Remarks to excavator: ***** NOT CLEAR TO DIG OUTSIDE WORK AREA *****

MARKED TEL & POWER CONTACTED ANDREW

Locate Info:

SASKPOWER - LA2 METRO Status: Marked 2 Uti Completed: 07/18/2011 13:18:50 Notes:.
SASKTEL - LA2 METRO Status: Marked 2 Uti Completed: 07/18/2011 13:18:50 Notes:.

ANY CONCERNS OR QUESTIONS REGARDING THIS LOCATE, PLEASE CONTACT THE LOCATING SERVICES DEPARTEMENT AT 877-955-8131 OR BY EMAIL AT locates@magnaelectric.com

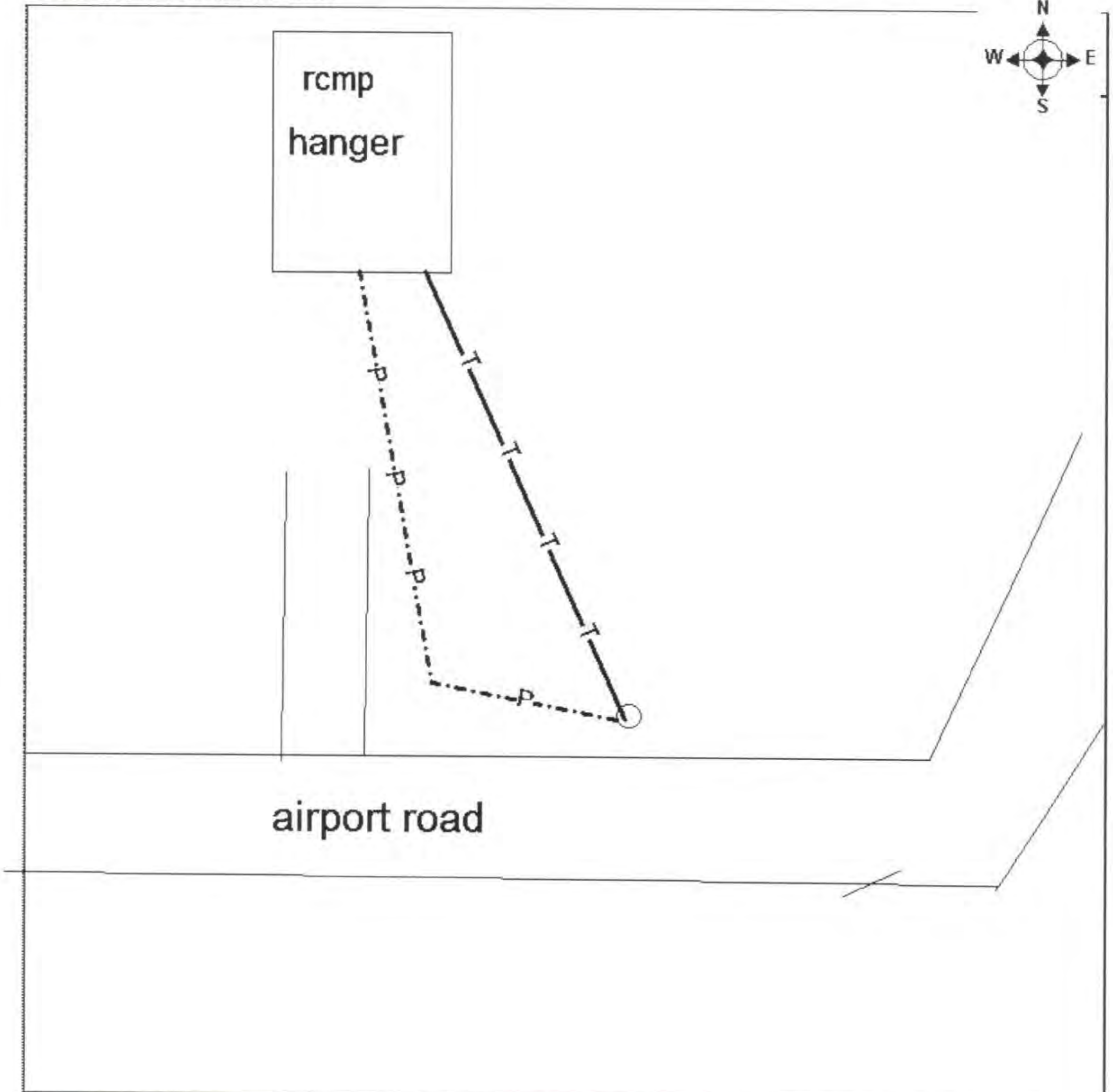
SaskTel SaskEnergy SaskPower

Locate Sketch

Method of marking lines: Flags [X] Paint [X] Stakes [ ]

Ticket No: 2011293517

Sketch of proposed excavation/Plant location



Sketch is for illustration purpose only. Not to scale. Refer to actual stakes and markings for location (s).

Legend: SaskTel T (solid line) SaskEnergy G (dashed line) SaskPower P (dashed and dotted line)

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Surface markings color code: SaskTel: Orange SaskEnergy: Yellow SaskPower: Red

Date: 07/18/2011 12:20:21 Customer Contacted: Yes [X] No [ ] How Contacted: Phone [ ] Door Tag [ ] Record of Locate [ ]

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Wherever used herein, Utility refers to SaskEnergy/SaskTel/SaskPower and any employees or agents of the Utility/Utilities.

You, by signing the front of this Record of Locate, acknowledge that you are the owner, or an authorized agent for the owner of the location(s) of the excavation ("You") and You agree as follows:

1 The Utility/Utilities shall not be liable for any claims, damages, costs, liability, damage to property, or injury or death arising from, or caused by the work or excavation, or failure to abide by the location advice or any other terms or conditions provided herein;

2 You agree to indemnify the Utility, its successors and assigns, from and against all causes of action, claims, damages, costs, liability, demands, damage to property, and injury or death which may be alleged, claimed or brought against the Utility/Utilities by You, your heirs, successors, assigns, employees, contractors, invitees, or by any other third party, in respect or arising out of the work or excavation, or failure to abide by the location advice or any other terms or conditions provided herein;

3 You are responsible to provide supervision services in respect of any work or excavation, unless it is otherwise indicated herein that the Utility/Utilities shall provide same, in which case You are responsible to arrange for same with the Utility/Utilities as outlined herein;

4 You shall immediately upon demand reimburse the Utility for any losses, claims, costs, or damages to the facilities of the Utility caused by or arising out of the work or excavation, or failure to abide by the located advice or any other terms or conditions provided herein;

INSTRUCTIONS:

1 The project owner must provided accurate information on the scope of work and determines the starting and end points.

2 The excavator or the locator may request a pre-excavating meeting at the jobsite just prior to the actual marking of facility locations. Such pre-excavating meetings can be important for major, or unusual, excavations.

3 A visual inspection of the site shall be completed during the facility locating process by both the excavator and the locator. The locator can refer to the Corporation's facility drawings to determine the location of the facilities in the vicinity of the proposed excavation.

4 The located area is properly established and identified on the Record of Locate Form.

5 Stakes and markings are provided only for the work area specified by you.

6 <u>Ticket life is 10 working days from the date the locate was performed as noted on the Record of Locate Form.</u>

7 If work has not started within ten working days after the locate is completed by the Utility/Utilities, you must again notify Sask 1st Call to re-locate the work area and provide an updated facilities locate.

8 The excavator, where practical, protects and preserves the staking, marking or other designations for underground facilities until no longer required for proper and safe excavation. <u>Do not proceed if the stakes or marks have become obliterated or are displaced</u>. The excavator shall call Sask 1st call to <u>request a re-locate</u> when excavation continues past the life of the ticket.

9 From the start of the excavation and until work and backfilling is completed, you must take every precaution to ensure that no damage will result to the lines, their coatings, protective wrapping or cathodic protection devices and no stress will be applied to the lines.

10 Do not move lines or other installations, dangerous conditions may result at this or other locations.

11 When backfilling, ensure that the cables or pipes will remain in their original position during settlement by thoroughly compacting the backfill under them and keeping them supported. Ensure proper soil is used for backfill, ensure no sharp objects.

12 The Utilities only locate facilities that they own and have no knowledge of or responsibilities for locating facilities owned by others, including customer secondary lines or pipes.

13 Customer is responsible to remove stakes, pin flags or markings upon completion of work.

14 The location marking of buried facilities shall follow the international color code.

15 Multiple facilities in a "joint use" trench and/or corridor are marked individually and with corridor markers if applicable.

16 Do not excavate (including digging, boring, pushing, ploughing, or trenching the ground) without first day lighting to expose lines at a number of locations sufficient to determine their exact position and depth. If any location appears not to coincide with the marking or stake, contact <u>Sask 1st Call to request a re-locate of the location.</u>

17 When excavation is to take place within the Utility's specified tolerance/safety corridor, the excavator exercises such reasonable care as may be necessary for the protection of any underground facility in or near the excavation area. Methods to consider, based on certain climate or geographical conditions, include: hand digging when practical or other methods with the approval of the facility owner/operator. <u>Always dig by hand when you are within 1 meter of the underground facility.</u>

18 <u>The excavator uses reasonable care to avoid damaging underground facilities. An excavator discovering of causing damage to underground facilities notifies the utility/utilities. All breaks, leaks, nicks, dents, gouges, or other damage to facility line coatings or cathodic protection will be reported.</u>

19 The Utility/Utilities have the right to request that they inspect the exposed cable or pipe for damage or safety hazards. Do not attempt to locate lines by probing the ground with any pointed tool or object.

<u>If you damage our underground facilities, please call immediately</u>; SaskEnergy – 1-888-700-0427, SaskTel – 611, SaskPower – 310-2220.

<u>In the event of a natural gas leak</u>, you must do the following:

- **Notify all persons in the area or any premises that may be affected**
- **Keep traffic and pedestrians out of the area, take steps to protect the health and safety of any worker**
- **Do not backfill any damaged facilities until the damage has been inspected by the Utility and has authorized the backfill. <u>Leaking natural gas must be allowed to dissipate into the air.</u>**

Andrew Passalis

From: helpdesk@saskenergy.com
Sent: Friday, July 15, 2011 5:28 PM
To: apassalis@mts.net
Subject: Request 2011293517

SASK 1ST CALL
Locate Request Confirmation

Reason Code:ROUTINE LOCATE

Ticket #:2011293517
Date and Time Processed: 07/15/2011 16:25:49

CALLER INFORMATION

ANDREW PASSALIS
EGE ENGINEERING LTD.

Excavator Type:HOMEOWNER
Tel.:(204)791-4938

DIG LOCATION

City:PRINCE ALBERT
Comments :
Address :190
To:
Street : AIRPORT ROAD
Nearest Intersecting Street :
HIGHWAY 55
Second Intersecting Street :

Additional Dig Information:
W1107151345000 TEST HOLES TO BE DRILLED ON SW CORNER, N SIDE AND WEST SIDE OF PROPERTY (RCMP HANGAR). PLEASE CALL TO CONFIRM LOCATE DATE AND RESULTS.

Remarks:

The following utility owners have been notified of your proposed excavation site:

-SKTEL L 136 -SKPOWER L 102 -SKENERGY 141

PLEASE REMEMBER:

You must notify any other parties who may have underground facilities in the dig area.

Contractor 's informations

Contact name :	Andrew Passalis
Phone :	(204) 791-4938
Fax :	
Cellphone :	(204) 791-4938
Pager :	
E-mail :	apassalis@mts.net
Company :	EGE Engineering Ltd.
House # :	511
Street :	511 Pepperloaf Crescent
City :	Winnipeg
Province :	MANITOBA
Postal code :	R3R 1E6
Working for :	Public Works & Government Services Canada
Alternate Contact Name :	David Klassen
Alternate Contact Phone :	(204) 612-0944

Dig Location Information

Work City

PRINCE ALBERT, SK M

Work Address / Street Search

AIRPORT ROAD

House #: 190

Intersection Street 1: HIGHWAY 55

Intersection Street 2: 15 Street NE

Exact Dig Location

☐ Alley ☐ Street ☒ Front lot
☒ Side ☐ Sidewalk ☒ Back lot

☐ Contact caller to arrange a site meeting
☒ Contact caller to confirm loc. complete

Work Start Date

August 02, 2011 08:00

Work Type

TEST HOLES

Additionnal Information

Additional Dig/ Location Information: Test holes to be drilled on SW corner, N side and west side of property (RCMP Hangar). Please call to confirm locate date and results.

Remarks:

APPENDIX B

REGULATORY APPROVALS

August 3, 2011

Your file
Prince Albert Airport RCMP
Our file
11-2554

Ms. Gayle Sommerfelt
City of Prince Albert
1084 Central Avenue
Prince Albert, SK
S6V 7P3

RE: Airport Project: Boreholes - Prince Albert, SK
(See attached spreadsheet)

Ms. Sommerfelt,

We have evaluated the captioned proposal and NAV CANADA has no objection to the project as submitted.

In the event that you should decide not to proceed with this project, please advise us accordingly so that we may formally close the file. If you have any questions, contact the Land Use Department by telephone at 1-866-577-0247 or e-mail at landuse@navcanada.ca.

NAV CANADA's land use evaluation is valid for a period of 12 months. Our assessment is limited to the impact of the proposed physical structure on the air navigation system and installations; it neither constitutes nor replaces any approvals or permits required by Transport Canada, Industry Canada, other Federal Government departments, Provincial or Municipal land use authorities or any other agency from which approval is required. Industry Canada addresses any spectrum management issues that may arise from your proposal and consults with NAV CANADA Engineering as deemed necessary.

Yours truly,

Scott English
for
David Legault
Manager, Data Collection
Aeronautical Information Services

cc NOPR-Northern and Prairie Region, Transport Canada
CYPA-PRINCE ALBERT (GLASS FIELD)

Transport Canada Transports Canada

Prairie and Northern Region
4, 2nd Floor – 2625 Airport Drive
Saskatoon, Saskatchewan, S7L 7L1

August 2nd 2011

File Number:
5151-C135-3

RDIMS 6897101

Attn.: Airport Manager
Prince Albert Airport
1084 Central Avenue
Prince Albert, Saskatchewan, S6V 7P3

Dear Ms. Sommerfelt,

Re: Prince Albert drill on airport property

I am writing with respect to the plan of construction operation (PCO) submitted to our office July 20th 2011.

We have reviewed the plan and submit the following comments for your action:

1. Your plan for the conduct of airport operations during the period of construction is approved;
2. All undertakings with respect to the plan (PCO) and construction must adhere to the Canadian Aviation Regulations and the requirements of the *Aerodrome Standards and Recommended Practices* manual (TP 312).
3. All temporary hazards, including trenches, within the runway strip area are to comply with the guidance material contained in AC 302-003;
4. A copy of the plan must be appended to the Airport Operations Manual, as a temporary amendment to the Manual, during the period of construction;
5. Provide us with notification upon completion of the project and
6. An amendment to the Airport Operations Manual regarding changes to the physical specifications of the airport must be completed and submitted to this office for approval.

Yours truly,

Didrik Strand

Transport Canada | Transports Canada
Civil Aviation Inspector | Inspecteur l'aviation civile
Prairie & Northern Region | Région des Prairies et du Nord
Suite # 4 2625 Airport Drive
Saskatoon, Saskatchewan, S7L 7L1
Telephone |telephone (306) 975-6906 / Cellular |cellulaire (306) 717-6314
Facsimile | télécopieur (306) 975-5926 / TTY | ATS (613) 990-4500
Email | courriel: didrik.strand@tc.gc.ca
Government of Canada | Gouvernment du Canada

Canada

Plan of Construction Operations (PCO)

Airport: *City of Prince Albert Airport (Glass Field)*

Project: Installation of Monitoring wells on RCMP leased land and at three locations situated on City property.

Start Date: August 2nd 2011 Finish Date: August 5th 2011

Originator: Name: City Of Prince Albert for

Company ~~EGE Engineering Ltd.~~

Phone 204-612-0944

FAX 204-837-6473

E-mail david_klassen@mts.net

Project Contacts:

Airport Operator: City Of Prince Albert

Phone 306-953-4900 FAX 306-953-4915

E-mail gsommerfelt@city pa.com

Other Contact: Joel Brimacombe Title Environmental Manager

Phone 306-780-3137 FAX 306-780- 6106

E-mail joel.brimacombe@rcmp-.gc.ca

- Description of the construction project:

- The work will consist of drilling 14 test holes and installing ground water monitoring wells which are located on the leased RCMP property, including 3 on the area east of the RCMP hangar property line.

(Provide a full description of the planned construction project)

- Stages/phases of the construction & schedules:

- The work is to start on August 2nd and be completed August 5th 2011 weather permitting.

- **THE CONSULTANT FOR THE PROJECT MUST HAVE ALL LOCATES DONE PRIOR TO DRILLING.**

- **ALSO CONTACT HIGHLINE ELECTRIC (VINCE EITHER) AT 306-961-4435 for AIRSIDE LOCATES**

(List the different stages of the construction activities with anticipated start and finish dates)

- Types & frequency of air traffic:

- Approximately 40 movements/day.

- ATR, Saab, B1900, King Air, Pilatus

(List the types of aircraft and number of daily movements anticipated during the construction period)

- Disruptions to air traffic:

- There will be no impact to or disruptions to air traffic

(What will be the impact on and disruptions to the air traffic as listed above.)

- Position and height of equipment (relative to runways & taxiways):

- Test holes #1 and 2 are on the grass area on airside.

- Test hole #9 is located on City Of Prince Albert groundside property.

- The equipment used for the drilling is 4.27 metres or 14ft

(Provide the location and maximum working height of the construction equipment or vehicles and where that equipment will be working in relationship to the taxiway or runway edges/ends. This information is required to assess the impact on Obstacle Limitation Surfaces.)

- Work on runway strips and adjacent to taxiways:

- There is no hazard to the runway or Taxiway Bravo.

- The closest test hole is 16.6 metres from the centerline of Taxiway Bravo and is located on the edge of the RCMP apron. The drilling rig will set up on the grass adjacent to the RCMP apron for the installation of the monitoring well. The contractor will have traffic cones set up when drilling.

- I will meet with the contractor prior to starting to advise him they will be confined to the area on the drawings and must not leave or drive on the main apron or taxiway. The can drive on the RCMP leased property to Gate #3 which they can use to enter and exit the property.

(Refer to green pages in the back of TP 312E - Aerodrome Standards & Recommended Practices, Attachment A, page 5, temporary hazards on runway strips. Which zone will you be working in, what restrictions and operational conditions will apply to your project? Include a statement that work and temporary hazards on the runway strip will comply with TP312, Attachment A, Section 5.3)

- Unserviceability markings, barriers and lighting provided:

- The RCMP consulting firm EGE and contractor will be installing the groundwater monitoring wells as soon as the drilling of the test hole is complete.

- There is no foot or air traffic in this area. The test holes will not be left open or unattended.

(Refer to TP312, chapter 6.2 and 7.4.)

- Displaced and/or relocated thresholds/A

(If the project will require a displaced or relocated threshold, provide an explanation as to why this is required, what percentage slope the calculations are based on, how will the new threshold be marked and lighted , what buffer is being provided for jet or prop blast, consideration .)

- Declared distance during all phases/N/A

(Based on the above calculation what will be the revised declared distances.)

- Access control, vehicle operations and escorts:

- The RCMP contractor will access the property using RCMP Gate 3

(How will vehicles and equipment access the construction site, will AVOP's be issued, are radio licences required, will vehicles be escorted, whom will be providing the escorts.)

- Communications plan (prior to construction and during construction):

- Prior to the contractor drilling on airside I will meet with the contractor, RCMP Environmental Manager, and consultant for the project to discuss the work area and leaving the work area other than Gate #3 will not be permitted.

- EMERGENCY NUMBERS WILL BE PROVIDED TO THE CONTRACTOR AND CONSULTANT PRIOR TO STARTING ON AUGUST 2nd, 2011.

- The Airport Staff will monitor the contractor.

(Every construction project requires a Communication Plan. The Plan will cover communication with the airport's clients/users, Nav Canada and Transport Canada during all phases of the project; #1: Planning Phase, #2: Pre-construction Phase #3: Construction Phase.)

Airport Ops ↔ ATC:

ATC ↔ Construction Site:

Airport Ops ↔ Construction Site:

Airport Ops ↔ Users (Stakeholders):

Airport Ops ↔ Transport Canada:

- NOTAMs as per the NOTAM procedure manual:

- No NOTAM will be issued an advisory to the FSS will be issued.

The drilling is outside any movement area

(Provide a draft of all anticipated NOTAMS. Notams revising declared distances must be pre approved by Transport Canada)

- Drawing or Blueprints: ATTACHED

(Provide any drawings required to support your Plan of Construction Operation. It is the airport operator's responsibility to ensure the drawings and final product meet Aerodrome Certification requirements, CARs 302 and TP312 4th edition)

- Amendments to publications and the Airport Operations Manual
- The Plan of Construction will be attached to the AOM's at the City's Maintenance Garage, the Flight Service Station and City Hall. We will remove the PCO after construction is completed and Transport Canada has been notified.

(Identify what amendments will need to be made to aeronautical publications and to the AOM

APPROVAL OF PLAN OF CONSTRUCTION OPERATIONS

PROJECT:

RCMP Monitoring Wells Installation

AIRPORT NAME:

Prince Albert Airport (Glass Field

AIRPORT OPERATOR and CERTIFICATE HOLDER:

City of Prince Albert

AIRPORT MANAGER:

Gayle Sommerfelt 306-961-0002

CERTIFICATE NUMBER:

5151-C135

I undertake to meet the obligations set out in this plan of construction; and I hereby certify that the information in this plan is complete and accurate and no relevant information has been omitted.

11 / 08 / 02 — AM

Date (Y-M-D) *Signature of Airport Operator/Certificate Holder*

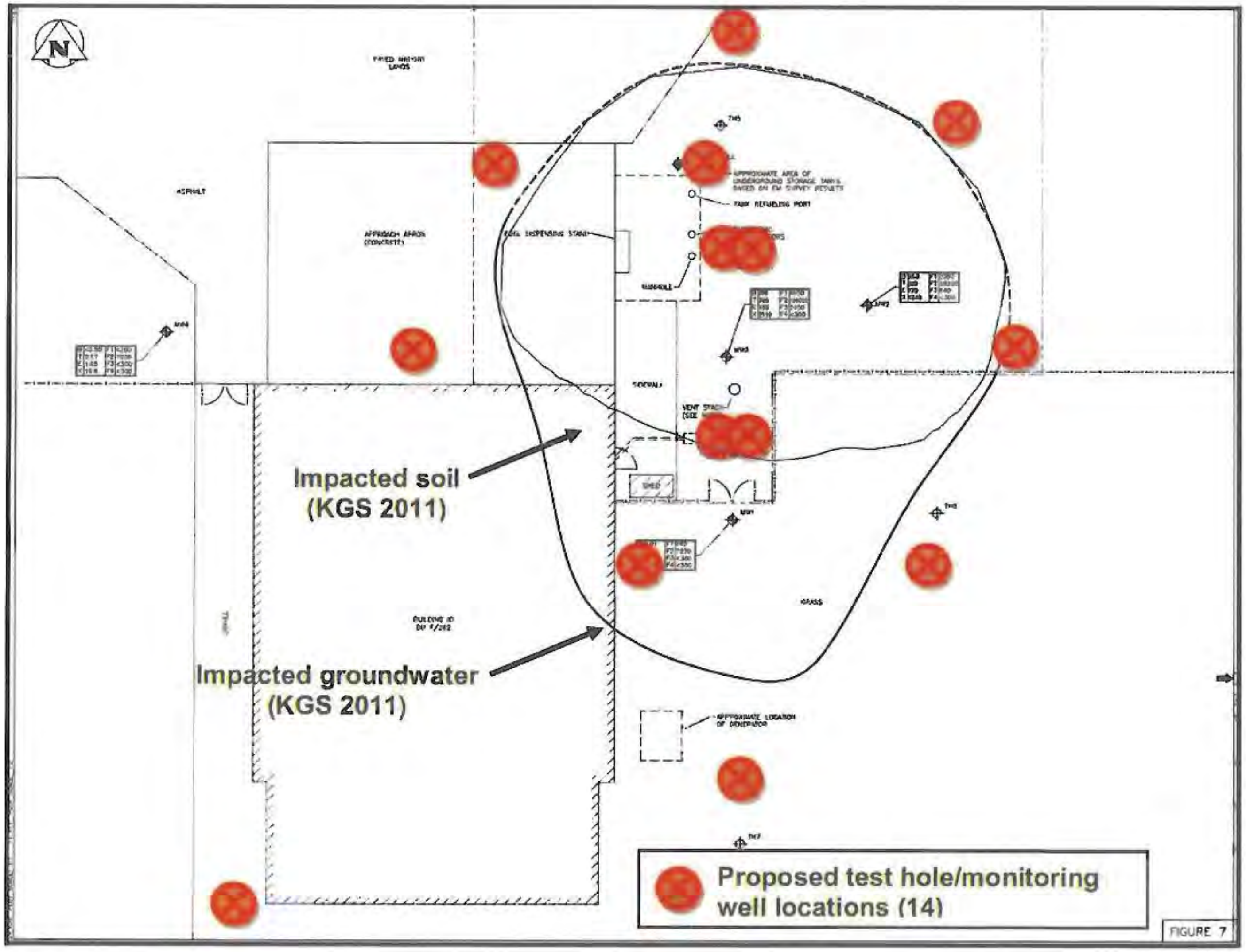
This Plan of Construction Operations Manual/Amendments is approved

Date (Y-M-D) *for Minister of Transport*

Canada

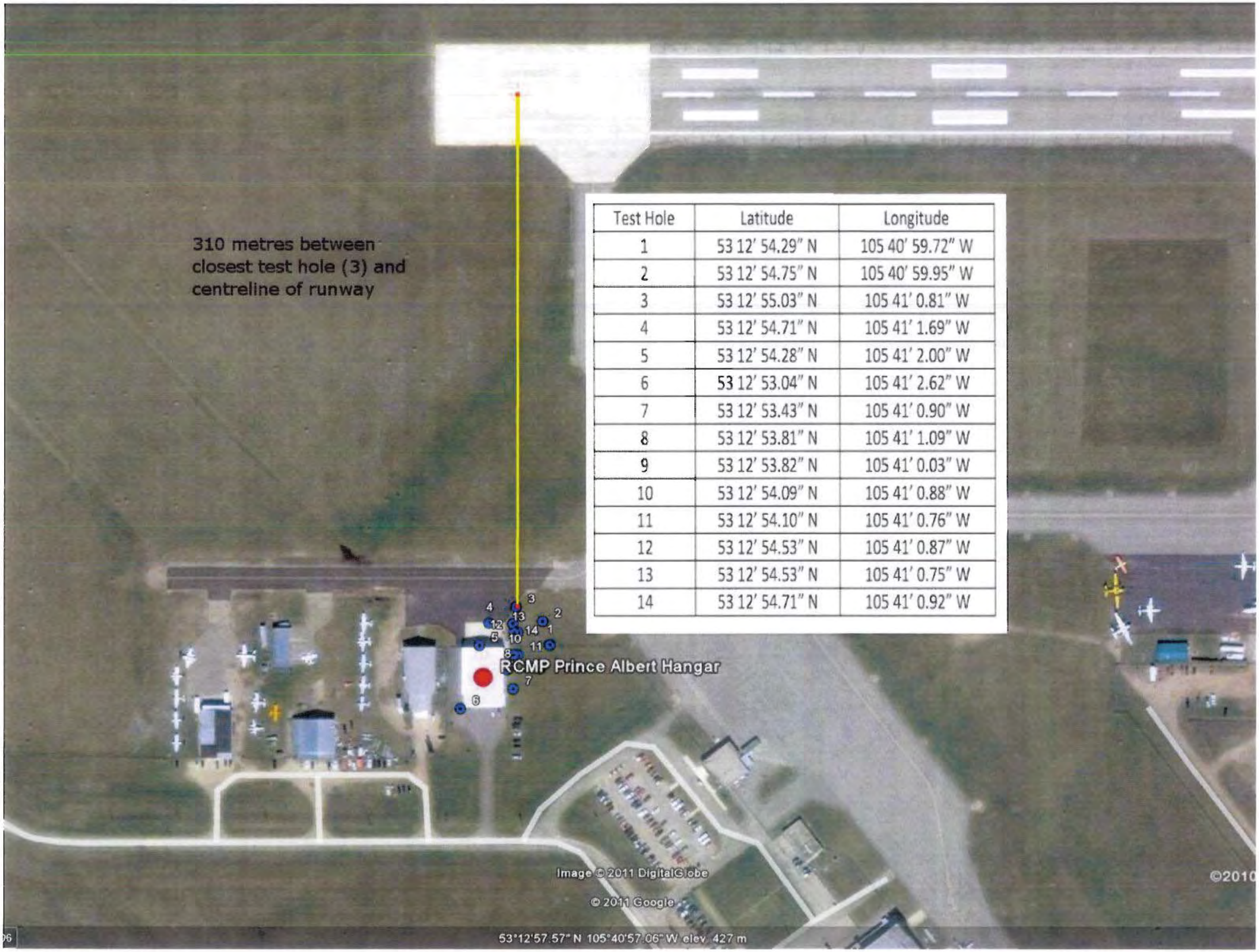
EMERGENCY & CONTACT NUMBERS

EMERGENCY	**911**
FLIGHT SERVICE STATION (FSS)	**306-765-8801**
AIRPORT MANAGER **GAYLE SOMMERFELT**	**306-961-0002 cell** **306-953-4900 office**
AIRPORT SUPERVISORS	**306-960-7372 cell** **306-953-4966 office**
ELECTRITION **VINCE ETHIER**	**306-961-4435 cell**
AIRSIDE ESCORTS	**306-960-7372** **306-961-0002**
EGE Engineering Ltd. **David Klassen**	**204-612-0944**
Joel Brimacombe **RCMP Environmental Manager**	**306-780-3137**

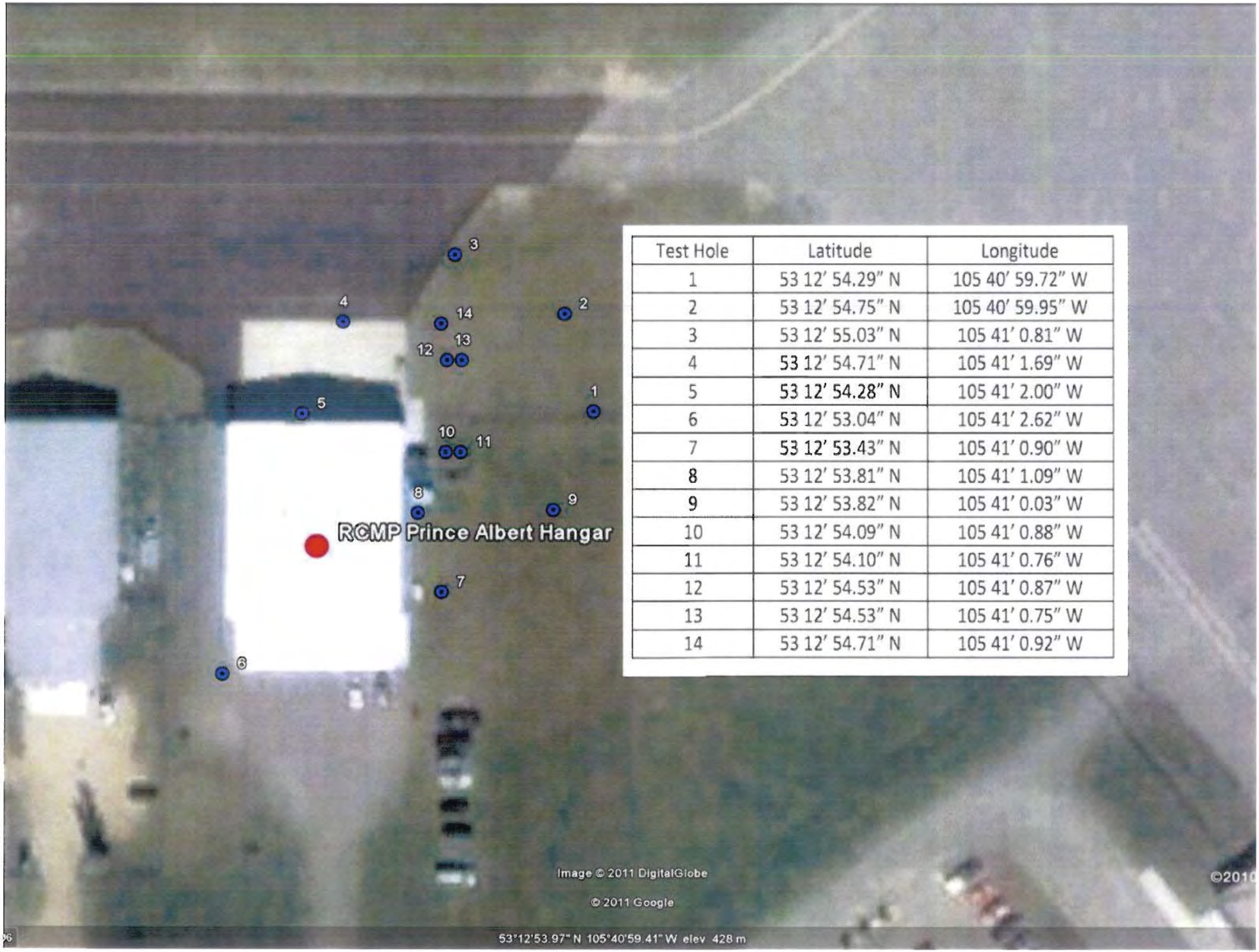

N
Impacted soil
(KGS 2011)
Impacted groundwater
(KGS 2011)
Proposed test hole/monitoring well locations (14)
FIGURE 7

Distance from closest test hole to centreline of runway = 309 m.

Test hole location plan. Three test holes to be located east of RCMP property (red box).



Test Hole	Latitude	Longitude
1	53 12' 54.29" N	105 40' 59.72" W
2	53 12' 54.75" N	105 40' 59.95" W
3	53 12' 55.03" N	105 41' 0.81" W
4	53 12' 54.71" N	105 41' 1.69" W
5	53 12' 54.28" N	105 41' 2.00" W
6	53 12' 53.04" N	105 41' 2.62" W
7	53 12' 53.43" N	105 41' 0.90" W
8	53 12' 53.81" N	105 41' 1.09" W
9	53 12' 53.82" N	105 41' 0.03" W
10	53 12' 54.09" N	105 41' 0.88" W
11	53 12' 54.10" N	105 41' 0.76" W
12	53 12' 54.53" N	105 41' 0.87" W
13	53 12' 54.53" N	105 41' 0.75" W
14	53 12' 54.71" N	105 41' 0.92" W



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11	53 12′ 54.10″ N	105 41′ 0.76″ W
12	53 12′ 54.53″ N	105 41′ 0.87″ W
13	53 12′ 54.53″ N	105 41′ 0.75″ W
14	53 12′ 54.71″ N	105 41′ 0.92″ W

Photo of drill rig to be used at RCMP Prince Albert Hangar site investigation. Maximum boom height is 4.27 m (14 feet).

NAV CANADA

Land Use Proposal Submission Form

Date Received by NAV CANADA	NC file N° / Ref N°	TC FileN° / Ref N°
	11-2554	5151 C 135-3

General Information:

Company/Owner Name: RCMP		Contact Person: Joel Brimacombe – Environmental Manager	
Address: Regina F-Division, Bag Service 2500, 6101 Dewdney Ave	City: Regina	Prov: SK	Postal Code: S4P 3K7
Tel: 306-780-3137	Fax: 306-780-6106	Email: joel.brimacombe@rcmp-	24 Hour Emergency Number:
Applicant: EGE Engineering Ltd.		Contact Person: David Klassen, P.Geo. – Environmental Scientist	
Address: 511 Pepperloaf Crescent	City: Winnipeg	Prov: MB	Postal Code: R3R 1E6
Tel: 204-612-0944	Fax: 204-837-6473	Email: david.klassen@mts.net	24 Hour Emergency Number: 204-612-0944
Airport Authority : City of Prince Albert (If within 6 km of a lighted aerodrome)		Airport Manager: Gayle Sommerfelt, Airport Manager	
Address: 1084 Central Avenue		City: Prince Albert	Prov: SK
Postal Code: S6V 7P3	Tel:306-961-0002	Fax: 306-953-4915	Email: gsommerfelt@citypa.com

Details of Proposal:

- Please provide the data in the highest resolution as it was obtained.
- For geographic coordinates, provide up to four (4) decimal places of a second.
- For ground elevation and tower height, provide up to four (4) decimal places of a meter or foot.

Project #, Street Address, etc.: Prince Albert Airport RCMP		Nearest Town, Province: Prince Albert, SK	
Geographic Coordinates of Site in NAD 83: Lat. N 53 / 12 / 887 (Degrees / Minutes / Seconds) Long. W 105 / 41 / 026 (Degrees / Minutes / Seconds)			
Linear Structures: Indicate Starting Point on 1st line and End Point 2nd line: Lat. N / / Long. W / /			
Type of Structure: Drilling rig	New Structure? ☐Yes ☒No	Height Added (If Existing)	☐ft ☐m
Cranes to be used? ☐Yes ☒ No *If Yes, see Note 4 on page 3*	Ground Elevation (Above Sea Level)	428.19	☐ft ☒m
Dimensions: Drilling to occur on RCMP property (46 m by 98 m) and slightly east – see attached site plan	Structure Height (Above Ground Level)	4.27	☐ft ☒m
Materials & Roof Shape (If Building): Drill test holes/ install groundwater wells with protective flush mounted metal covers	Total Height (Above Sea Level) Structure Height + Ground Elevation	432.46	☐ft ☒m
Proposed Construction Start Date: August 2, 2011	Approximate Duration of Construction: August 2, 2011 – August 5, 2011		
If Temporary Structure, indicate Removal Date: August 5, 2011	From: 0800 hrs	To: 2000 hrs	

Comments:
Work includes drilling test holes and installing groundwater monitoring wells on RCMP Hangar property (lot size 46 m x 98 m) and adjacent City of Prince Albert property to the east. See attached site plan for test hole locations. Maximum boom height of drill rig = 4.27 m (14 feet).

Electronic / Telecommunication Interference (Check off the items which may cause interference and provide details)

High Voltage Equipment	☐ Details
Arc Welding	☐ Details
Radar Emission	☐ Details
High Powered Transmissions	☐ Details
VHF Radio	☐ Details
Other	☐ Details

Obstruction to Vision On Airport With NAV CANADA Services/Control Tower, FSS, CARS:	
Check the items which may cause obstructions to vision to the installation:	
Line of Sight	☐ Details
Generation of Smoke/Vapour	☐ Details
Reflectivity	☐ Details
Aircraft Parking	☐ Details
Exterior Lighting	☐ Details

Maps/Drawings (Required for Supporting Documentation)

Proposals for structures not adjacent to an airport OR on airport without NAV CANADA Services

- 1:50,000 topographical map section with the location of the proposed structure clearly marked. The map must contain a legend indicating the map datum (NAD27 or 83) and the contour interval.
- Legal survey (if available)

Proposals adjacent within 2 km from an airport with FSS, Control Tower, Localizer or ILS navigational aids

- 1:50,000 topographical map section with the location of the proposed structure clearly marked. The map must contain a legend indicating the map datum (NAD27 or 83) and the contour interval.
- For localizer/ILS runways, site plan at 1:2000 scale, with distance bar, showing 90° distances to nearest runway centre line/centre line extension, and distance to nearest runway threshold. Note: reference TP1247 to determine requirement when along an extended centerline of a localizer/ILS runway up to 6km.
- For buildings, architectural drawings in both plan view (with north arrow indicator) detailing orientation of building and dimensions; and profile view detailing maximum height of building (including rooftop structures) and elevation at grade level.

Proposals on an airport with FSS or Control Tower Services, Weather Services, Localizer or ILS navigational aids

- 1:50,000 topographical map section with the location of the proposed structure clearly marked. The map must contain a legend indicating the map datum (NAD27 or 83) and the contour interval.
- Airport plan at 1:500 scale, with distance bar, showing orientation of structures including vehicle and aircraft entry/exit points.
- For sites with localizer/ILS runways site plan at 1:2000 scale, with distance bar, showing 90° distances to nearest runway centre line/centre line extension, taxiway, and distance to nearest runway threshold. Note: will require drawings for structures up to 6km along the extended centreline of the localizer/ILS runway.
- Site plan depicting entire airport and location of proposed structures and excavations/trenching include depth.
- Site plans at 1:2000 scale, with distance bar, showing line of sight to the mandatory viewing areas (runways and taxiways) identifying existing structures along the sightline in both cross section (profile) view and plan view format. Refer to NAV CANADA sightline requirements for criteria of mandatory viewing areas.
- For buildings, architectural drawings in both plan view (with north arrow indicator) detailing orientation of building and dimensions; and profile view detailing maximum height of building (including rooftop structures) and elevation at grade level.

Applicant/Representative Signature	Print Name	Date
ENG EGE ENG LTD	[illegible]	[illegible]

For a detailed description on NAV CANADA's requirements and additional information, refer to the NAV CANADA website at www.navcanada.ca >Land Use Proposal

NAV CANADA's evaluation of land use proposals and construction proposals neither constitutes nor replaces any approvals or permits required by Transport Canada, other Federal Government Departments, Provincial or Municipal land use authorities, or any agency from which any approval is required.

Please Submit by email to landuse@navcanada.ca

Transport Canada / Transports Canada

APPENDIX C TO CAR 621.19 - ANNEXE C RAC 621.19

TC File No./Ref No. – TC n° du dossier/N° de réf.

AERONAUTICAL OBSTRUCTION CLEARANCE FORM
FORMULAIRE D'AUTORISATION D'OBSTACLE AÉRIEN

TO BE COMPLETED BY APPLICANT – À REMPLIR PAR LE REQUÉRANT

Operator's Name – Nom de l'opérateur City of Prince Albert Airport		
Operator's Address – Adresse de l'opérateur 1084 - Central Avenue Prince Albert SK. S6V 7P3		
Operator's Contact – Agent de liaison de l'opérateur Gayle Sommerfelt Airport Manager 306-953-4902 or 306-961-0002		
Contact's Telephone No. – N° de téléphone de liaison 306-953-4902 or 306-961-0002	Contact's FAX No. – N° de télécopieur de liaison 306-953-4915	Contact's Email Address – Adresse électronique de liaison gsommerfelt@citypa.com
Applicant's Name – Nom du requérant EGE Engineering Ltd.	Address – Adresse %11 - Pepperloaf Cres. Winnipeg MB. R3R 1E6	
City – Ville Winnipeg	Province/Territory - Province/Territoire Manitoba	Postal – Code – postal R3R 1E6
Applicant's Telephone No. – N° de téléphone du requérant 204-612-0944	Applicant's FAX No. – N° de télécopieur du requérant 204-837-6473	Applicant's Email Address – Adresse électronique du requérant david.klassen@mts.net

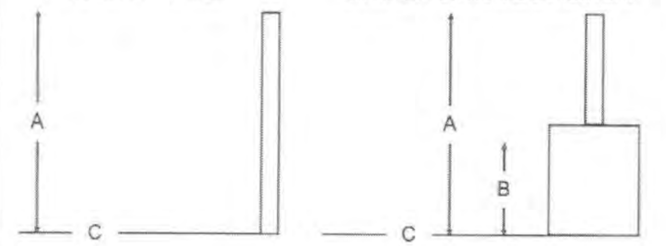
Nearest city / town to proposed facility – Ville la plus proche de la structure proposée: Prince Albert

Geographic coordinates of structure – coordonnées géographiques de la structure:

°	'	"		°	'	"				
53	12	887	N Latitude / Latitude N	105	41	026	W Longtitude / Longtitude O	☐ NAD27	☑ NAD83	☐ WGS84

TOWERS / ANTENNAS – TOURS / ANTENNES

BUILDING OR OTHER STRUCTURE – BÂTIMENT OU AUTRE STRUCTURE



		Feet – Pieds	Meters – Mètres
A	Height above ground / Hauteur au-dessus du sol		432.46
B	Building height / Hauteur du bâtiment		4.27
C	Ground elevation above sea level / Hauteur du sol au-dessus du niveau de la mer		428.19

List any tall adjacent buildings and structures which may shield the proposed structure (Attach sketch)

Faire une liste indiquant les structures et bâtiments avoisinants plus haut que le bâtiment projeté (Inclure un diagramme)

New struc. – Nouv. struc.	Add. to exist. struc. incl. total hght. – Ajout à un bâti. exis. incl. hauteur total	Proposed Construction – Date – de construction proposée
☐ Yes / Oui ☑ No / Non	N/A	August 5th 2011

TYPE OF STRUCTURE (narrative description and function) – GENRE DE STRUCTURE (description narrative et fonction)

Work will consist of drilling test holes with the drilling rig boom height of 4.27m.
After drilling and testing are complete the contractor will install groundwater testing wells with a protected flush mounted metal covers

Signature (of applicant) (du requérant) ▶

Date (Y/A-M-D/J) 11/07/19 July 19/2011

TRANSPORT CANADA USE ONLY – À L'USAGE DE TRANSPORTS CANADA

AERONAUTICAL ASSESSMENT – ÉVALUATION AÉRONAUTIQUE

Site acceptable – Emplacement acceptable
☐ Yes / Oui ☐ No / Non (if no, reason) (si non, pourquoi)

Lighting as per (TP382) required – Balisage lumineux tel que demandé au (TP382)
☐ Yes / Oui ☐ No / Non or / ou

Painting as per (TP382) required – Balisage peint tel que demandé au (TP382)
☐ Yes / Oui ☐ No / Non or / ou

Temporary lighting required – Nécessité d'un balisage lumineux temporaire
☐ Yes / Oui ☐ No / Non (if yes, type) (si oui, de quel genre)

Advise Transport Canada in writing 90 days before construction / Avertir Transports Canada par écrit 90 jours avant la construction ▶ ☐ when construction starts / au commencement de la construction ☐ and on completion / et à la fin des travaux ☐ Valid to / Valide jusqu'au

Civil Aviation Inspector (as required) – Inspecteur Aviation Civile (si nécessaire)
Comments – Commentaires

(Y/A-M-D/J)

Signature Date

Regional Manager Aerodrome Safety / Gestionaire Régional Sécurité des aérodromes ▶ Signature Date (Y/A-M-D/J)

26-0427 (0005-01)

Canada

Obstacle information						Upon completion		
Number	LAT dd mm ss.ss	LONG -ddd mm ss.ss	Ground Elevation (Feet)	Structure Height (Feet)	Total Height (Feet)	Lighted Y/N	Painted Y/N	Construction Date
Example 1	60 39 16.59	-110 36 14.01	2162.50	463.00	2626	Y	N	15-Jun-07
PA-18	53 12 55.28	-105 41 00.35	1404.8228	14.0092	1418.8320			
PA-19	53 12 55.93	-105 40 59.48	1404.8228	14.0092	1418.8320			
PA-20	53 12 55.92	-105 41 01.57	1404.8228	14.0092	1418.8320			
PA-21	53 12 56.52	-105 41 00.65	1404.8228	14.0092	1418.8320			
RW-1	53 12 54.80	-105 41 00.88	1404.8228	14.0092	1418.8320			
RW-2	53 12 54.18	-105 41 00.88	1404.8228	14.0092	1418.8320			

NAV CANADA

LAND USE PROPOSAL SUBMISSION FORM

Date Received by NAV CANADA	NC file N° / Ref N°	TC FileN° / Ref N°
	11-2554	5151 C-135-3

GENERAL INFORMATION:

Company/Owner Name: RCMP | Contact Person: Joel Brimacombe – Environmental Manager

Address: Regina F-Division, Bag Service 2500, 6101 Dewdney Ave | City: Regina | Prov: SK | Postal Code: S4P 3K7

Tel: 306-780-3137 | Fax: 306-780-6106 | Email: joel.brimacombe@rcmp- | 24 Hour Emergency Number:

Applicant: EGE Engineering Ltd. | Contact Person: David Klassen, P.Geo. – Environmental Scientist

Address: 511 Pepperloaf Crescent | City: Winnipeg | Prov: MB | Postal Code: R3R 1E6

Tel: 204-612-0944 | Fax: 204-837-6473 | Email: david.klassen@mts.net | 24 Hour Emergency Number: 204-612-0944

Airport Authority : City of Prince Albert (If within 6 km of a lighted aerodrome) | Airport Manager: Gayle Sommerfelt, Airport Manager

Address: 1084 Central Avenue | City: Prince Albert | Prov: SK

Postal Code: S6V 7P3 | Tel:306-961-0002 | Fax: 306-953-4915 | Email: gsommerfelt@citypa.com

DETAILS OF PROPOSAL:

- Please provide the data in the highest resolution as it was obtained.
- For geographic coordinates, provide up to four (4) decimal places of a second.
- For ground elevation and tower height, provide up to four (4) decimal places of a meter or foot.

Project #, Street Address, etc.: Prince Albert Airport RCMP | Nearest Town, Province: Prince Albert, SK

Geographic Coordinates of Site in NAD 83: Lat. N 53 (Degrees) / 12 (Minutes) / 887 (Seconds) Long. W 105 (Degrees) / 41 (Minutes) / 026 (Seconds)

Linear Structures:
Indicate Starting Point on 1st line and End Point 2nd line: Lat. N / / Long. W / /

SEE ATTACHED. EMAIL

Type of Structure: Drilling rig 4.27 MAX BOOM	New Structure? ☐Yes ☒No	Height Added (If Existing)	☐ft ☐m
Cranes to be used? ☐Yes ☒No *If Yes*, see *Note 4 on page 3*	Ground Elevation (Above Sea Level)	428.19	☐ft ☒m
Dimensions: Drilling to occur on RCMP property (46 m by 98 m) and slightly east – see attached site plan	Structure Height (Above Ground Level)	4.27	☐ft ☒m
Materials & Roof Shape (If Building): Drill test holes/ install groundwater wells with protective flush mounted metal covers	Total Height (Above Sea Level) Structure Height + Ground Elevation	432.46	☐ft ☒m
Proposed Construction Start Date: ~~August 2, 2011~~ Oct. 4 – Oct 7/11	Approximate Duration of Construction: August 2, 2011 – August 5, 2011		
If Temporary Structure, indicate Removal Date: August 5, 2011	From: 0800 hrs	To: 2000 hrs	

Comments:
Work includes drilling 2 ~~test holes and installing groundwater monitoring~~ RECOVERY wells on RCMP Hangar property (lot size 46 m x 98 m) and adjacent City of Prince Albert property to the east. See attached site plan for test hole locations. Maximum boom height of drill rig = 4.27 m (14 feet).
NORTH ANOTHER 4 MONITORING WELLS.

ELECTRONIC / TELECOMMUNICATION INTERFERENCE (Check off the items which may cause interference and provide details)

High Voltage Equipment	☐ Details
Arc Welding	☐ Details
Radar Emission	☐ Details
High Powered Transmissions	☐ Details
VHF Radio	☐ Details
Other	☐ Details

OBSTRUCTION TO VISION ON AIRPORT WITH NAV CANADA SERVICES/CONTROL TOWER, FSS, CARS:	
Check the items which may cause obstructions to vision to the installation:	
Line of Sight	☐ Details
Generation of Smoke/Vapour	☐ Details
Reflectivity	☐ Details
Aircraft Parking	☐ Details
Exterior Lighting	☐ Details

MAPS/DRAWINGS (Required for Supporting Documentation)

Proposals for structures not adjacent to an airport OR on airport <u>without</u> NAV CANADA Services

- 1:50,000 topographical map section with the location of the proposed structure clearly marked. The map must contain a legend indicating the map datum (NAD27 or 83) and the contour interval.
- Legal survey (if available)

Proposals adjacent <u>within 2 km</u> from an airport with FSS, Control Tower, Localizer or ILS navigational aids

- 1:50,000 topographical map section with the location of the proposed structure clearly marked. The map must contain a legend indicating the map datum (NAD27 or 83) and the contour interval.
- For localizer/ILS runways, site plan at 1:2000 scale, with distance bar, showing 90° distances to nearest runway centre line/centre line extension, and distance to nearest runway threshold. Note: reference TP1247 to determine requirement when along an extended centerline of a localizer/ILS runway up to 6km.
- For buildings, architectural drawings in both plan view (with north arrow indicator) detailing orientation of building and dimensions; and profile view detailing maximum height of building (including rooftop structures) and elevation at grade level.

Proposals <u>on</u> an airport with FSS or Control Tower Services, Weather Services, Localizer or ILS navigational aids

- 1:50,000 topographical map section with the location of the proposed structure clearly marked. The map must contain a legend indicating the map datum (NAD27 or 83) and the contour interval.
- Airport plan at 1:500 scale, <u>with distance bar,</u> showing orientation of structures including vehicle and aircraft entry/exit points.
- For sites with localizer/ILS runways site plan at 1:2000 scale, with distance bar, showing 90° distances to nearest runway centre line/centre line extension, taxiway, and distance to nearest runway threshold. Note: will require drawings for structures up to 6km along the extended centreline of the localizer/ILS runway.
- Site plan depicting entire airport and location of proposed structures and excavations/trenching include depth.
- Site plans at 1:2000 scale, <u>with distance bar,</u> showing line of sight to the mandatory viewing areas (runways and taxiways) identifying existing structures along the sightline in both cross section (profile) view and plan view format. Refer to NAV CANADA sightline requirements for criteria of mandatory viewing areas.
- For buildings, architectural drawings in both plan view (with north arrow indicator) detailing orientation of building and dimensions; and profile view detailing maximum height of building (including rooftop structures) and elevation at grade level.

Applicant/Representative Signature	**Print Name**	**Date**
[illegible] for [illegible] Eng Ltd	[illegible]	Sept 14/11 ~~July 14/11~~

For a detailed description on NAV CANADA's requirements and additional information, refer to the NAV CANADA website at www.navcanada.ca >Land Use Proposal

NAV CANADA's evaluation of land use proposals and construction proposals neither constitutes nor replaces any approvals or permits required by Transport Canada, other Federal Government Departments, Provincial or Municipal land use authorities, or any agency from which any approval is required.

Please Submit by email to landuse@navcanada.ca

Transport Canada / Transports Canada

APPENDIX C TO CAR 621.19 - ANNEXE C RAC 621.19

TC File No./Ref No. – TC n° du dossier/N° de réf.

AERONAUTICAL OBSTRUCTION CLEARANCE FORM
FORMULAIRE D'AUTORISATION D'OBSTACLE AÉRIEN

TO BE COMPLETED BY APPLICANT – À REMPLIR PAR LE REQUÉRANT

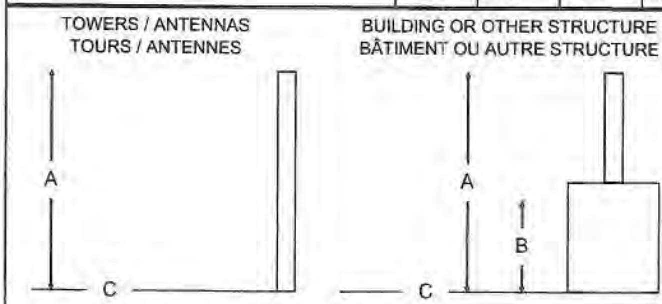
Operator's Name – Nom de l'opérateur City of Prince Albert Airport		
Operator's Address – Adresse de l'opérateur 1084 - Central Avenue Prince Albert SK. S6V 7P3		
Operator's Contact – Agent de liaison de l'opérateur Gayle Sommerfelt Airport Manager 306-953-4902 or 306-961-0002		
Contact's Telephone No. – N° de téléphone de liaison 306-953-4902 or 306-961-0002	Contact's FAX No. – N° de télécopieur de liaison 306-953-4915	Contact's Email Address – Adresse électronique de liaison gsommerfelt@citypa.com
Applicant's Name – Nom du requérant EGE Engineering Ltd.	Address – Adresse %11 - Pepperloaf Cres. Winnipeg MB. R3R 1E6	
City – Ville Winnipeg	Province/Territory - Province/Territoire Manitoba	Postal – Code – postal R3R 1E6
Applicant's Telephone No. – N° de téléphone du requérant 204-612-0944	Applicant's FAX No. – N° de télécopieur du requérant 204-837-6473	Applicant's Email Address – Adresse électronique du requérant david.klassen@mts.net

Nearest city / town to proposed facility – Ville la plus proche de la structure proposée: Prince Albert

Geographic coordinates of structure – coordonnées géographiques de la structure:

52°	12'	55.92"	N Latitude / Latitude N	105°	41'	01.57"	W Longtitude / Longtitude O	☐ NAD27 ☑ NAD83 ☐ WGS84
53	12	887		105	41	026		

TOWERS / ANTENNAS – TOURS / ANTENNES | BUILDING OR OTHER STRUCTURE – BÂTIMENT OU AUTRE STRUCTURE



		Feet – Pieds	Meters – Mètres
A	Height above ground / Hauteur au-dessus du sol		432.46
B	Building height / Hauteur du bâtiment		4.27
C	Ground elevation above sea level / Hauteur du sol au-dessus du niveau de la mer		428.19

List any tall adjacent buildings and structures which may shield the proposed structure (Attach sketch)

Faire une liste indiquant les structures et bâtiments avoisinants plus haut que le bâtiment projeté (Inclure un diagramme)

New struc. – Nouv. struc. ☐ Yes Oui ☑ No Non	Add. to exist. struc. incl. total hght. – Ajout à un bâti. exis. incl. hauteur total N/A	Proposed Construction – Date – de construction proposée August 5th 2011

TYPE OF STRUCTURE (narrative description and function) – GENRE DE STRUCTURE (description narrative et fonction)

Work will consist of drilling test holes with the drilling rig boom height of 4.27m. After drilling and testing are complete the contractor will install groundwater testing wells with a protected flush mounted metal covers

Signature (of applicant) (du requérant) ▶ Sep 19/11 | Date (Y/A-M-D/J) Jan 14 2011

TRANSPORT CANADA USE ONLY – À L'USAGE DE TRANSPORTS CANADA

AERONAUTICAL ASSESSMENT – ÉVALUATION AÉRONAUTIQUE

Site acceptable – Emplacement acceptable
☐ Yes Oui ☐ No Non (if no, reason) (si non, pourquoi)

Lighting as per (TP382) required – Balisage lumineux tel que demandé au (TP382)
☐ Yes Oui ☐ No Non or ou

Painting as per (TP382) required – Balisage peint tel que demandé au (TP382)
☐ Yes Oui ☐ No Non or ou

Temporary lighting required – Nécessité d'un balisage lumineux temporaire
☐ Yes Oui ☐ No Non (if yes, type) (si oui, de quel genre)

Advise Transport Canada in writing 90 days before construction / Avertir Transports Canada par écrit 90 jours avant la construction ▶ ☐ when construction starts / au commencement de la construction ☐ and on completion / et à la fin des travaux ☐ Valid to / Valide jusqu'au

Civil Aviation Inspector (as required) – Inspecteur Aviation Civile (si nécessaire)
Comments – Commentaires

(Y/A-M-D/J)

Signature | Date

Regional Manager Aerodrome Safety / Gestionaire Régional Sécurité des aérodromes ▶ Signature | Date (Y/A-M-D/J)

26-0427 (0005-01)

Canada

Gayle Sommerfelt

From:	david.klassen@mymts.net on behalf of David Klassen <david.klassen@mts.net>
Sent:	Monday, September 19, 2011 1:57 PM
To:	Gayle Sommerfelt
Subject:	Re: Supplemental Test Holes at RCMP Prince Albert Hangar

Here you go.

PA-18	52 12' 55.28"	105 41' 00.35"
PA-19	52 12' 55.93"	105 40' 59.48"
PA-20	52 12' 55.92"	105 41' 01.57"
PA-21	52 12' 56.52"	105 41' 00.65"

RW-1	53 12' 54.80"	105 41' 00.88"
RW-2	53 12' 54.18"	105 41' 00.88"

David Klassen, P.Geo.
Environmental Scientist

EGE Engineering Ltd.
Engineering, Geosciences and Environmental
511 Pepperloaf Crescent
Winnipeg, Manitoba
R3R 1E6

Ph:(204) 612-0944
Fax: (204) 837-6473
e-mail:david.klassen@mts.net

On 19/09/2011 2:49 PM, Gayle Sommerfelt wrote:
David
I need these in Degree /Min/Seconds.
For instance the last Land Use had Geographic Coordinates in NAD 83 of Lat N 53 / 12 / 887 and Long W 105 /41 /026
Thanks Gayle

From: david.klassen@mymts.net [mailto:david.klassen@mymts.net] **On Behalf Of** David Klassen
Sent: Monday, September 19, 2011 1:30 PM
To: Gayle Sommerfelt; Passalis, Andrew
Subject: Re: Supplemental Test Holes at RCMP Prince Albert Hangar

PA-18	53.215356	105.683433
PA-19	53.215535	105.683189
PA-20	53.215533	105.683769
PA-21	53.215699	105.683515

These four test holes will be drilled with the same rig as was on site previously in August.

We have added two large diameter recovery wells within the area already approved for work in August. The coordinates are:


PA-21
52 12' 56.52
105' 41 00.65
PA-20
52 12 55.92
105 41 01.5
PA-19
52 12' 55.93
105 40' 59.48
PA-18
52 12' 55.28
105 41' 00.35
2 Recovery Wells
Image © 2011 DigitalGlobe
© 2011 Google
©2010
161 m
13 U 454378.71 m E 5896548.72 m N elev 428 m

Plan of Construction Operations (PCO)

Airport: *City of Prince Albert Airport (Glass Field)*

Project: Installation of two recovery wells on RCMP leased land and four monitoring wells on City property adjacent to Taxiway Bravo.

Start Date: Approx. October 3rd, 2011 Finish Date: October 7, 2011

Originator: Name: City Of Prince Albert for

Company ~~EGE Engineering Ltd.~~

Phone 204-612-0944

FAX 204-837-6473

E-mail david .klassen@mts.net

Project Contacts:

Airport Operator: City Of Prince Albert

Phone 306-953-4900 FAX 306-953-4915

E-mail gsommerfelt@city pa.com

Other Contact: Joel Brimacombe Title Environmental Manager

Phone 306-780-3137 FAX 306-780- 6106

E-mail joel.brimacombe@rcmp-.gc.ca

- Description of the construction project:

- The work will consist of drilling 14 test holes and installing ground water monitoring wells which are located on the leased RCMP property, including 3 on the area east of the RCMP hangar property line.

- EGE Engineering would like to add four additional test holes and monitoring wells;

- Also 2 recovery wells on the RCMP property beside the underground storage tank.

- Three of the test holes are located 4 metres from the paved edge of Taxiway Bravo, and the test hole PA21 is located about 20 metres from Taxiway Bravo and 265 metres from the runway centerline.

(Provide a full description of the planned construction project)

- Stages/phases of the construction & schedules:

- The work is to start on August 2nd and be completed August 5th 2011 weather permitting.

- The additional test hole location drilling would take place October 4 to October 7th, and will be completed in one day. The two recovery wells on the RCMP property will take two days.

- **THE CONSULTANT FOR THE PROJECT MUST HAVE ALL LOCATES DONE PRIOR TO DRILLING.**

- **ALSO CONTACT HIGHLINE ELECTRIC (VINCE EITHER) AT 306-961-4435 for AIRSIDE LOCATES**

Prince Albert Airport Plan of Construction Operations (PCO):

(List the different stages of the construction activities with anticipated start and finish dates)

- Types & frequency of air traffic:
- Approximately 40 movements/day.
- ATR, Saab, B1900, King Air, Pilatus

(List the types of aircraft and number of daily movements anticipated during the construction period)

- Disruptions to air traffic:
- There will be no impact to or disruptions to air traffic

(What will be the impact on and disruptions to the air traffic as listed above.)

- Position and height of equipment (relative to runways & taxiways):
- Test holes #1 and 2 are on the grass area on airside.
- Test holes PA18, 19, 20, 21, are situated on the grass area on airside
- Test hole #9 is located on City Of Prince Albert groundside property.
- The equipment used for the drilling is 4.27 metres or 14ft
- Same drilling rig will be used maximum height is 4.27 m or 14 ft.
- Smaller rig for the recovery wells will be used on the RCMP property. Maximum boom height is 10.5 m

(Provide the location and maximum working height of the construction equipment or vehicles and where that equipment will be working in relationship to the taxiway or runway edges/ends. This information is required to assess the impact on Obstacle Limitation Surfaces.)

- Work on runway strips and adjacent to taxiways:

- The three additional test holes PA18, PA19, and PA20 will be barricaded while the drilling is in progress.

- There is no hazard to the runway or Taxiway Bravo.

- An FSS advisory will be issued to pilots wishing to use taxiway Bravo of the equipment drilling in the area.

- All tenants that front Taxiway Bravo will be notified prior to the drilling.

- Planes with wing spans over 12.5m will not be allowed to use the taxiway until drilling is completed 1 day.

- The closest test hole is 16.6 metres from the centerline of Taxiway Bravo and is located on the edge of the RCMP apron. The drilling rig will set up on the grass adjacent to the RCMP apron for the installation of the monitoring well. The contractor will have traffic cones set up when drilling.

- I will meet with the contractor prior to starting to advise him they will be confined to the area on the drawings and must only use the taxiway to cross to the drilling site PA19, 20, and 21. They will be required to use Gate #3 which they can use to enter and exit the property.

(Refer to green pages in the back of TP 312E - Aerodrome Standards & Recommended Practices, Attachment A, page 5, temporary hazards on runway strips. Which zone will you be working in, what restrictions and operational conditions will apply to your project? Include a statement that work and temporary hazards on the runway strip will comply with TP312, Attachment A, Section 5.3)

- Unserviceability markings, barriers and lighting provided:

- Contractor will place barricades around the three test holes closest to taxiway Bravo.

- The RCMP consulting firm EGE and contractor will be installing the groundwater monitoring wells as soon as the drilling of the test hole is complete.

- There is no foot in this area. The test holes will not be left open or unattended.

(Refer to TP312, chapter 6.2 and 7.4.)

- Displaced and/or relocated thresholds/A

(If the project will require a displaced or relocated threshold, provide an explanation as to why this is required, what percentage slope the calculations are based on, how will the new threshold be marked and lighted , what buffer is being provided for jet or prop blast, consideration .)

- Declared distance during all phases/N/A

(Based on the above calculation what will be the revised declared distances.)

- Access control, vehicle operations and escorts:

- The RCMP contractor will access the property using RCMP Gate 3

(How will vehicles and equipment access the construction site, will AVOP's be issued, are radio licences required, will vehicles be escorted, whom will be providing the escorts,)

- Communications plan (prior to construction and during construction):

- Prior to the contractor drilling on airside I will meet with the contractor, RCMP Environmental Manager, and consultant for the project to discuss the work area and leaving the work area other than Gate #3 will not be permitted.

Prince Albert Airport Plan of Construction Operations (PCO):

- I will meet with the consultant/contractor, RCMP before any drilling begins.

- EMERGENCY NUMBERS WILL BE PROVIDED TO THE CONTRACTOR AND CONSULTANT PRIOR TO STARTING ON AUGUST 2nd, 2011.

- The Airport Manager will provide Emergency Contact numbers to the contractor/consultant the first week in October.

- The Airport Staff will monitor the contractor.

(Every construction project requires a Communication Plan. The Plan will cover communication with the airport's clients/users, Nav Canada and Transport Canada during all phases of the project; #1: Planning Phase, #2: Pre-construction Phase #3: Construction Phase.)

Airport Ops ↔ ATC:

ATC ↔ Construction Site:

Airport Ops ↔ Construction Site:

Airport Ops ↔ Users (Stakeholders):

Airport Ops ↔ Transport Canada:

- NOTAMs as per the NOTAM procedure manual:

- No NOTAM will be issued an advisory to the FSS will be issued.

The drilling is outside any movement area

(Provide a draft of all anticipated NOTAMS. Notams revising declared distances must be pre approved by Transport Canada)

- Drawing or Blueprints: ATTACHED

(Provide any drawings required to support your Plan of Construction Operation. It is the airport operator's responsibility to ensure the drawings and final product meet Aerodrome Certification requirements, CARs 302 and TP312 4th edition)

- Amendments to publications and the Airport Operations Manual
- The Plan of Construction will be attached to the AOM's at the City's Maintenance Garage, the Flight Service Station and City

Hall. We will remove the PCO after construction is completed and Transport Canada has been notified.

(Identify what amendments will need to be made to aeronautical publications and to the AOM

APPROVAL OF PLAN OF CONSTRUCTION OPERATIONS

PROJECT:

RCMP Monitoring and Recovery Wells Installation

AIRPORT NAME:

Prince Albert Airport (Glass Field

AIRPORT OPERATOR and CERTIFICATE HOLDER:

City of Prince Albert

AIRPORT MANAGER:

Gayle Sommerfelt 306-961-0002

CERTIFICATE NUMBER:

5151-C135

I undertake to meet the obligations set out in this plan of construction; and I hereby certify that the information in this plan is complete and accurate and no relevant information has been omitted.

Sep 19/11

Date (Y-M-D) — *Signature of Airport Operator/Certificate Holder*

This Plan of Construction Operations Manual/Amendments is approved

Date (Y-M-D) — *for Minister of Transport*

Canada

APPENDIX C

TEST HOLES LOGS

TEST HOLE: PA-01

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 1
Test Hole Location: 10.0 m E, 11.4 m N of NE Corner of Hangar, 13 U 454358.2 E, 5896424.0 N	**Elev.:** 99.905 m

SUBSURFACE PROFILE

Depth (m) | Soil Symbol | Soil Description | Monitoring Well

Ground Surface

0 m – SAND (Fill)
- brown
- fine grained, poorly graded
- trace gravel
- dry to damp
- no odour
- fine to coarse grained

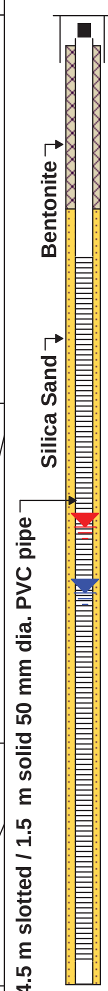
SILTY SAND
- grey
- fine grained
- moist to wet, soft
- no odour

SAND
- grey/brown
- fine to medium grained with depth
- poorly graded
- trace silt
- damp to wet at 3.4 m
- moderate hydrocarbon odour at 3.4 m
- medium grained

CLAY
- grey
- some silt
- damp, stiff
- low plasticity
- slight hydrocarbon odour

SILT
- grey
- some very fine sand, trace clay
- damp, firm
- interbedded with clay layers

End of Environmental Test Hole @ 6.0 m. Seepage at 3.3 m. Monitoring well installed.

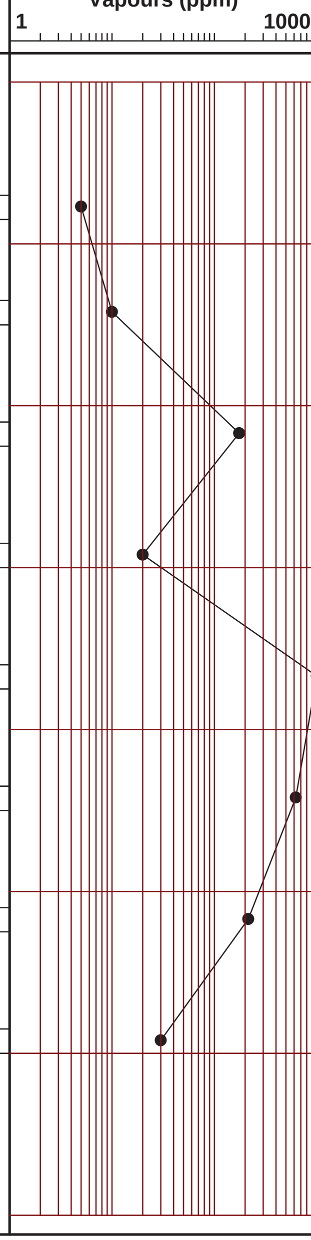


SAMPLE

Sample No.	Sample Type	% Recovery
1	G	50
2	G	50
3	G	65
4	G	65
5	G	70
6	G	70
7	G	100
8	G	100

TEST DATA

Combustible Organic Vapours (ppm)



Laboratory Analyses

Well Collar Elevation = 99.804 m

PL = 96.640 m on 11/10/04

Soil sample submitted for BTEX, PHC F1 to F4

WL = 96.232 m on 11/10/04

Soil sample submitted for BTEX, PHC F1 to F4

Elevation (m): 99.9, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/02	**Completion:** 11/08/02

TEST HOLE: PA-02

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment	
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01	**Page:** 1 of 2
Test Hole Location: 9.8 m E, 11.2 m N of NE Corner of Hangar, 13 U 454358.0 E, 5896424.2 N		**Elev.:** 99.905 m

SUBSURFACE PROFILE / SAMPLE / TEST DATA

Depth (m) | Soil Symbol | Soil Description | Monitoring Well | Sample No. | Sample Type | % Recovery | Combustible Organic Vapours (ppm) 1 – 1000 | Laboratory Analyses | Elevation (m)

Ground Surface (Elevation 99.9)

SAND (Fill) (0 – 2.4 m)
- brown
- fine grained, poorly graded
- trace gravel
- dry to damp
- no odour
- fine to coarse grained

SILTY SAND
- grey
- fine grained
- moist to wet, soft
- no odour

SAND
- grey/brown
- fine to medium grained with depth
- poorly graded
- trace silt
- damp to wet at 3.4 m
- moderate hydrocarbon odour at 3.4 m
- medium grained

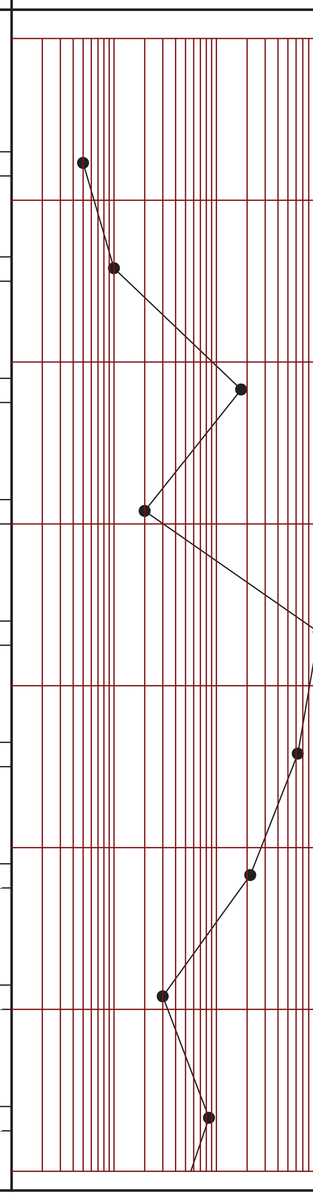
CLAY
- grey
- some silt
- damp, stiff
- low plasticity
- slight hydrocarbon odour

SILT
- grey
- some very fine sand, trace clay
- damp, firm
- interbedded with clay layers

CLAY
- grey
- some silt
- damp, stiff
- intermediate to high plasticity
- no odour

Monitoring Well: Bentonite; 1.5 m slotted / 9.0 m solid 37 mm dia. PVC pipe

Sample No.	Sample Type	% Recovery
1	G	50
2	G	50
3	G	65
4	G	65
5	G	70
6	G	70
7	G	100
8	G	100
9	G	100



Laboratory Analyses:
- Well Collar Elevation = 99.810 m
- WL = 96.672 m on 11/08/24
- Soil sample submitted for BTEX, PHC F1 to F4 (Sample 5)
- Soil sample submitted for BTEX, PHC F1 to F4 (Sample 7)

Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

Elevation (m): 99.9, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

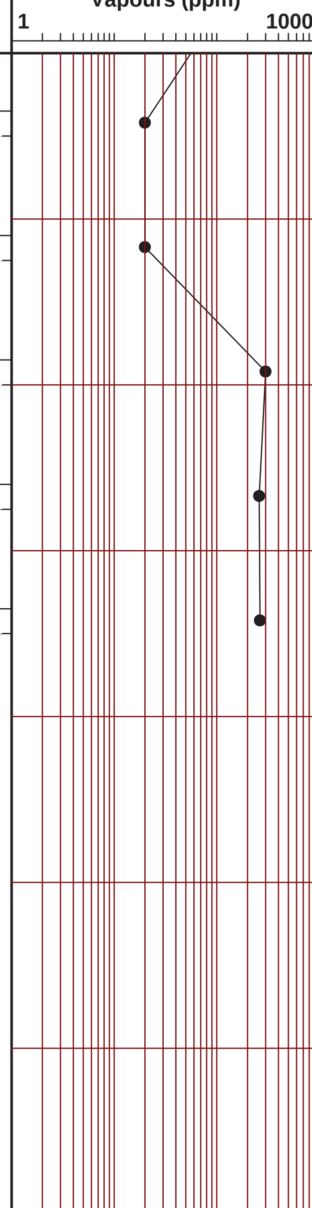
TEST HOLE: PA-02

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment	
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01	**Page:** 2 of 2
Test Hole Location: 9.8 m E, 11.2 m N of NE Corner of Hangar, 13 U 454358.0 E, 5896424.2 N		**Elev.:** 99.905 m

SUBSURFACE PROFILE / SAMPLE / TEST DATA

Depth (m)	Soil Description	Monitoring Well	Sample No.	Sample Type	% Recovery	Laboratory Analyses	Elevation (m)
	CLAYEY SILT - grey - some very fine sand - damp, very firm - low to non-plastic		10	G	100		
8	CLAY - as above - trace silt		11	G	100		92.0
9			12	G	100	Soil sample submitted for BTEX, PHC F1 to F4 and Grain Size	91.0
		Silica Sand	13	G	100		
10			14	G	100		90.0
	End of Environmental Test Hole @ 10.5 m. Seepage at 3.3 m. Monitoring well installed.						
11							89.0
12							88.0
13							87.0
14							86.0

Combustible Organic Vapours (ppm)



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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

TEST HOLE: PA-03

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 1
Test Hole Location: 3.6 m S, 5.8 m E of NE corrner of Hangar, 13 U 454353.9 E, 5896409.5 N	**Elev.:** 99.847 m

SUBSURFACE PROFILE

Depth (m) | Soil Symbol | Soil Description | Monitoring Well

Ground Surface (Elevation 99.8)

0–1.35 m: SANDY SILT (Fill)
- brown
- very fine grained
- damp, soft
- no odour

1.35–3.0 m: SAND
- brown
- fine grained, poorly graded
- trace silt
- damp, loose
- moist to wet at 2.85 m

3.0–4.5 m:
- brown/grey
- fine to medium grained
- slight sheen on soil to 3.8 m
- moderate hydrocarbon odour
- some gravel

4.5–6.0 m: SILT
- brown/grey
- some very fine sand
- wet, soft
- trace oxidation to 4.7 m
- grey
- damp, firm

End of Environmental Test Hole @ 6.0 m. Seepage at 3.2 m. Monitoring well installed.

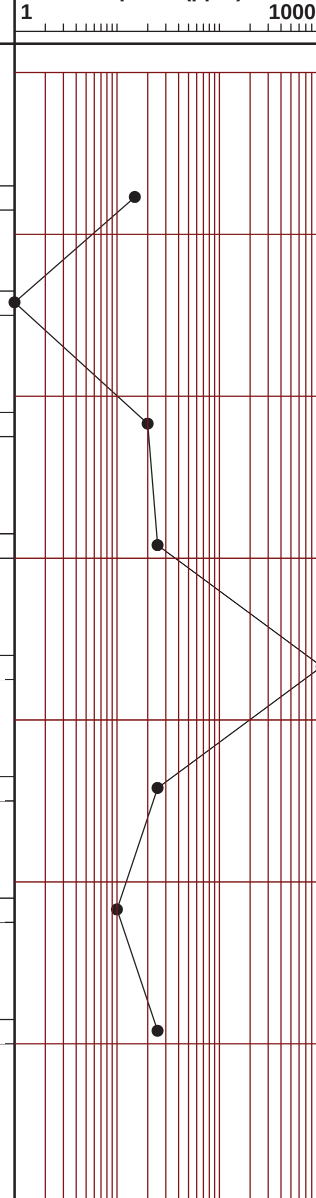
Monitoring Well: Bentonite; Silica Sand; 4.5 m slotted / 1.5 m solid 50 mm dia. PVC pipe

SAMPLE

Sample No.	Sample Type	% Recovery
1	G	90
2	G	90
3	G	75
4	G	75
5	G	100
6	G	100
7	G	100
8	G	100

TEST DATA

Combustible Organic Vapours (ppm)



Laboratory Analyses:
- Well Collar Elevevation = 99.745 m
- PL = 96.622 m on 11/10/04
- WL = 96.375 m on 11/10/04
- Soil sample submitted for BTEX, PHC F1 to F4, VOCs, Metals, Glycols and O&G
- Soil sample submitted for BTEX, PHC F1 to F4

Elevation (m): 99.8, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/02	**Completion:** 11/08/02

TEST HOLE: PA-04

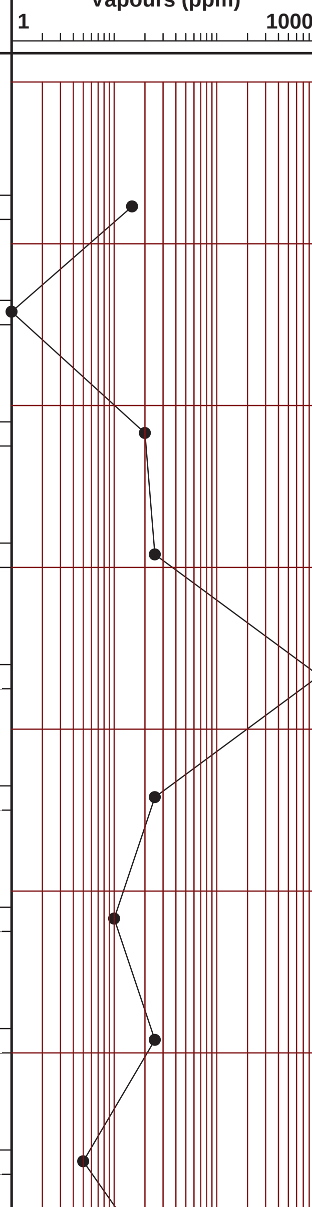
Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hanger. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 2
Test Hole Location: 3.8 m E, 6.0 m S of NE Corner of Hangar, 13 U 454354.2 E, 5896409.2 N	**Elev.:** 99.815 m

SUBSURFACE PROFILE | SAMPLE | TEST DATA

Depth (m)	Soil Description	Sample No.	Sample Type	% Recovery	Laboratory Analyses
0	Ground Surface				Well Collar Elevation = 99.726 m
0–1.35	**SANDY SILT (Fill)** - brown - very fine grained - damp, soft - no odour	1	G	90	
1.35–3.0	**SAND** - brown - fine grained, poorly graded - trace silt - damp, loose	2	G	90	
	- moist to wet at 2.85 m	3	G	75	
3.0–4.5	- brown/grey - fine to medium grained - slight sheen on soil to 3.8 m - moderate hydrocarbon odour	4	G	75	WL = 96.590 m on 11/08/24
		5	G	100	Soil sample submitted for BTEX, PHC F1 to F4, VOCs, Metals, Glycols and O&G
4.5	- some gravel	6	G	100	
4.55–5.1	**SILT** - brown/grey - some very fine sand - wet, soft - trace oxidation to 4.7 m	7	G	100	Soil sample submitted for BTEX, PHC F1 to F4
5.1–6.6	- grey - damp, firm	8	G	100	
6.6–7.0	- some clay and very fine sand - low to non plastic	9	G	100	

Monitoring Well: Bentonite; 1.5 m slotted / 9.0 m solid 37 mm dia. PVC pipe

Combustible Organic Vapours (ppm)



Elevation (m): 99.8, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

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Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/02	**Completion:** 11/08/02

TEST HOLE: PA-04

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment	
Project Location: RCMP Hanger. Prince Albert, SK	**Project No:** 0126-036-01	
Test Hole Location: 3.8 m E, 6.0 m S of NE Corner of Hangar, 13 U 454354.2 E, 5896409.2 N		**Elev.:** 99.815 m

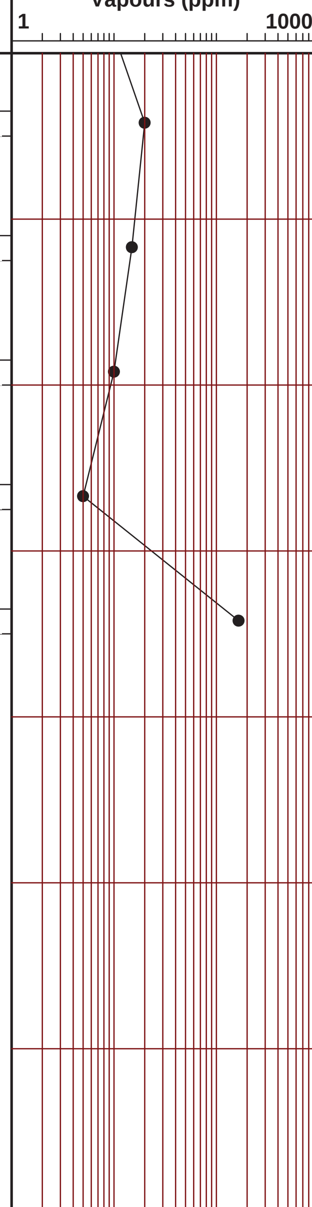
SUBSURFACE PROFILE / SAMPLE / TEST DATA

Depth (m)	Soil Description	Monitoring Well	Sample No.	Sample Type	% Recovery	Laboratory Analyses
~7.5–9.5	SILT and CLAY - grey - interbedded with very fine sand - damp, very firm to stiff - low plasticity		10	G	100	
			11	G	100	
			12	G	100	
9.5–10.5	SANDY SILT - grey - very fine grained - wet, soft to very firm at 10.2 m - no odour	Silica Sand	13	G	100	
			14	G	100	Soil sample submitted for BTEX, PHC F1 to F4
10.5	End of Environmental Test Hole @ 10.5 m. Seepage at 3.2 m. Monitoring well installed.					

Depth (m): 8, 9, 10, 11, 12, 13, 14

Elevation (m): 92.0, 91.0, 90.0, 89.0, 88.0, 87.0, 86.0

Combustible Organic Vapours (ppm)



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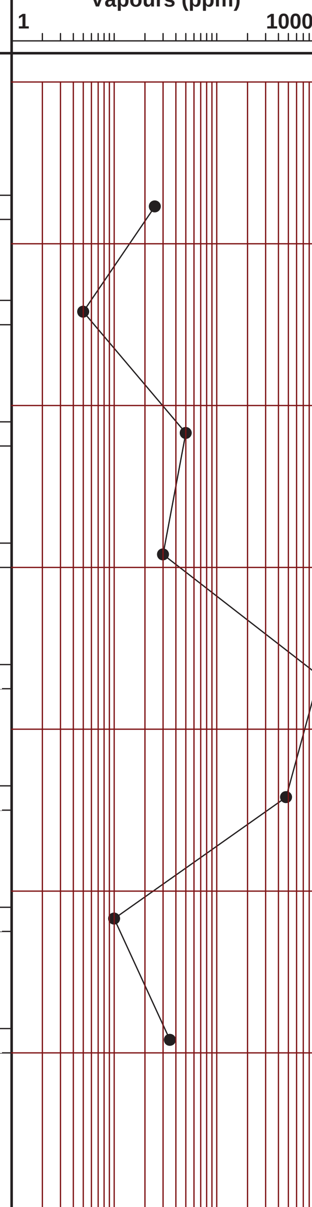
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/02	**Completion:** 11/08/02

TEST HOLE: PA-05

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment	
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01	**Page:** 1 of 1
Test Hole Location: 14.7 m N, 5.7 m E of NE corrner of Hangar, 13 U 454355.2 E, 5896427.9 N		**Elev.:** 99.855 m

SUBSURFACE PROFILE / SAMPLE / TEST DATA

Depth (m)	Soil Description	Monitoring Well	Sample No.	Sample Type	% Recovery	Laboratory Analyses	Elevation (m)
0	**Ground Surface**					Well Collar Elevation = 99.727 m	99.9
0–0.7	SILT - dark brown - some fine grained sand - trace organics - dry to damp, firm	Bentonite					
0.7–1.2	SILT - brown - some very fine sand - damp, soft - no odour	Bentonite	1	G	75		99.0
1.2–2.7	SAND - light brown - very fine to fine grained - trace silt - damp, loose - slight odour at 1.8 to 2.1 m	Silica Sand	2	G	75		98.0
			3	G	80	Soil sample submitted for Grain Size	
2.7–3.3	- brown/grey - fine to medium grained	4.5 m slotted / 1.5 m solid 50 mm dia. PVC pipe	4	G	80	PL = 96.631 m on 11/10/04	97.0
3.3–4.1	- grey - sheen		5	G	100	WL = 96.214 m on 11/10/04 Soil sample submitted for BTEX, PHC F1 to F4 and Grain Size	96.0
4.1–4.9	CLAY - brown - some silt - damp, very firm - low plastiicity - slight to moderate odour		6	G	100		95.0
4.9–6.0	- grey - damp, firm - high plasticity		7	G	100		
6	End of Environmental Test Hole @ 6.0 m. Seepage at 3.2 m. Monitoring well installed.		8	G	100	Soil sample submitted for BTEX, PHC F1 to F4	94.0
7							93.0



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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/02	**Completion:** 11/08/02

TEST HOLE: PA-06

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment	
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01	**Page:** 1 of 1
Test Hole Location: 2.0 m N, 29.4 m E of NE corner of Hangar, 13 U 454377.6 E, 5896415.0 N		**Elev.:** 99.769 m

SUBSURFACE PROFILE | SAMPLE | TEST DATA

Depth (m)	Soil Description	Sample No.	Sample Type	% Recovery	Laboratory Analyses	Elevation (m)
0	Ground Surface					99.8
0.0–1.2	SILT - brown - some fine grained sand - trace organics and rootlets to 0.3 m - dry to damp - no odour	1	G	70	Well Collar Elevation = 99.652 m	99.0
1.2–1.5	SILT - brown/grey - damp, soft to firm - no odour	2	G	70		
1.5–3.0	SAND - brown - fine grained, poorly graded - trace to some silt - damp - no odour	3	G	90		98.0
		4	G	90		97.0
3.0–3.7	- brown/grey - wet				WL = 96.591 m on 11/10/04	
3.7–4.1	- brown - fine to medium grained	5	G	100	Soil sample submitted for BTEX, PHC F1 to F4	96.0
4.1–5.0	CLAY - brown - some silt - damp, firm - low plasticity - grey	6	G	100		95.0
5.0–5.4	SILT - grey - some very fine sand - wet	7	G	100		
5.4–5.7	CLAY - as above					94.0
5.7–6.0	SILT - as above	8	G	100		
6.0	End of Environmental Test Hole @ 6.0 m. Seepage at 3.2 m. Monitoring well installed.					93.0
7						

Monitoring Well: Bentonite; Silica Sand; 4.5 m slotted / 1.5 m solid 50 mm dia. PVC pipe

Combustible Organic Vapours (ppm) (1 – 1000)

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Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

TEST HOLE: PA-07

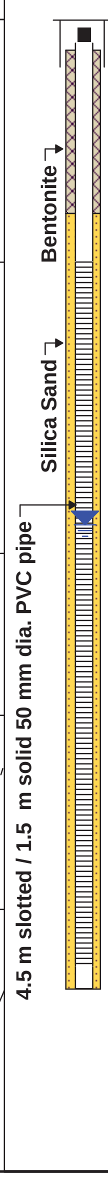
Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment	
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01	**Page:** 1 of 1
Test Hole Location: 23 m E, 17 m N of NE corner of Hangar, 13 U 454371.1 E, 5896430.0 N		**Elev.:** 99.859 m

SUBSURFACE PROFILE

Depth (m)	Soil Description
0	**Ground Surface**
0.0 – 1.5	SILT - brown - some fine sand - some organics to 0.3 m - dry to damp, firm
1.5 – 4.3	SAND - brown - fine grained, poorly graded - trace silt, organic layer at 2.8 - 2.85 m - damp, no odour - fine to medium grained - moderate odour at 3.5 - 4.0 m
4.3 – 5.5	SILT - brown - trace clay, trace very fine sand - damp, stiff - trace oxidation, no odour - grey - firm
5.5 – 6.0	CLAY - grey - trace silt - damp, stiff - intermediate to high plasticity - no odour

End of Environmental Test Hole @ 6.0 m. Seepage at 3.2 m. Monitoring well installed.

Monitoring Well

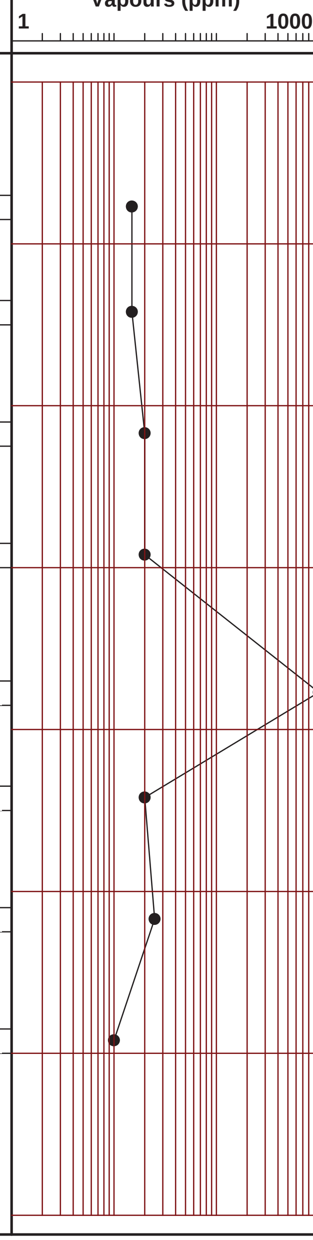


SAMPLE

Sample No.	Sample Type	% Recovery
1	G	70
2	G	70
3	G	90
4	G	90
5	G	100
6	G	100
7	G	100
8	G	100

TEST DATA

Combustible Organic Vapours (ppm)



Laboratory Analyses

Well Collar Elevation = 99.699 m

WL = 96.576 m on 11/10/04

Soil sample submitted for BTEX, PHC F1 to F4

Soil sample submitted for BTEX, PHC F1 to F4

Elevation (m): 99.9, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

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Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

TEST HOLE: PA-08

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 1
Test Hole Location: 9.1 m E, 25.8 m N of NE corner of Hangar, 13 U 454357.3 E, 5896438.8 N	**Elev.:** 99.739 m

SUBSURFACE PROFILE | SAMPLE | TEST DATA

Columns: Depth (m) | Soil Symbol | Soil Description | Monitoring Well | Sample No. | Sample Type | % Recovery | Combustible Organic Vapours (ppm) 1 – 1000 | Laboratory Analyses | Elevation (m)

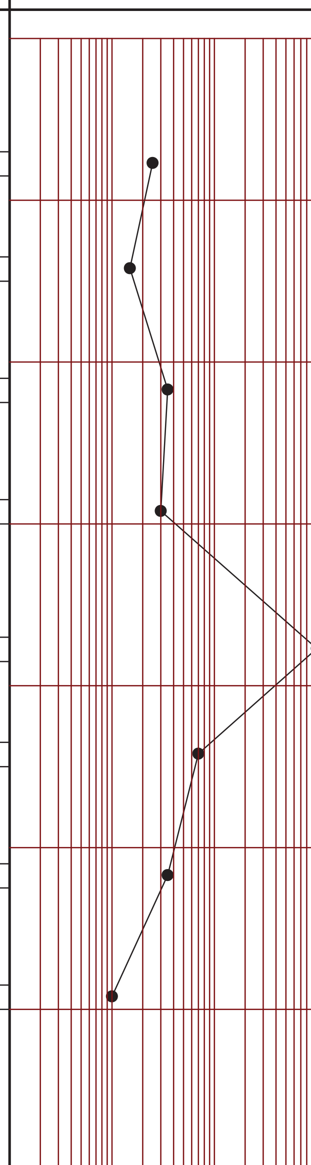
Ground Surface (Elevation 99.7)

Depth (m)	Soil Description
0 – ~0.7	SILT - brown - some fine sand, trace organics to 0.3m - dry
~0.7 – 1.3	- brown/grey - moist, soft
1.3 – 2.8	SAND - brown - fine grained, poorly graded - trace silt - damp, loose
2.8 – 3.6	- brown/grey - fine to medium grained - wet
3.6 – 4.3	- grey - silt lense at 3.75-3.8 m - sheen - medium grained
4.3 – 5.2	CLAY - brown/grey - with silt - firm, low plasticity - faint odour - grey - damp, stiff
5.2 – 5.9	SILT - grey - some very fine sand - damp to moist, soft - no odour
5.9 – 6.0	CLAY - as above

End of Environmental Test Hole @ 6.0 m. Seepage at 3.0 m. Monitoring well installed.

Monitoring Well: Bentonite; Silica Sand; 4.5 m slotted / 1.5 m solid 50 mm dia. PVC pipe

Sample No.	Sample Type	% Recovery
1	G	70
2	G	70
3	G	90
4	G	90
5	G	100
6	G	100
7	G	100
8	G	100



Laboratory Analyses:
- Well Collar Elevation = 99.652 m
- PL = 96.620 m on 11/10/04
- WL = 96.144 m on 11/10/04
- Soil sample submitted for BTEX, PHC F1 to F4 (Sample 5)
- Soil sample submitted for BTEX, PHC F1 to F4 (Sample 6)

Elevation (m): 99.7, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

TEST HOLE: PA-09

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment	
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01	**Page:** 1 of 1
Test Hole Location: 12 m W, 4.0 m N of NE corner of Hangar, 13 U 454336.2 E, 5896428.4 N		**Elev.:** 99.711 m

SUBSURFACE PROFILE

Depth (m) | Soil Symbol | Soil Description | Monitoring Well

Ground Surface

Depth (m)	Soil Description
0	CONCRETE
	SAND and GRAVEL (Fill) - brown - well graded - some fines - damp, dense
1	SAND - brown - fine grained, poorly graded - some silt - damp, loose - no odour
	- fine to medium grained
4	CLAY - brown/grey - with silt - firm, low plasticity - faint odour
	- grey
5	SILT - grey - some very fine sand and clay - damp, soft - no odour
6	End of Environmental Test Hole @ 6.0 m. Seepage at 3.0 m. Monitoring well installed.

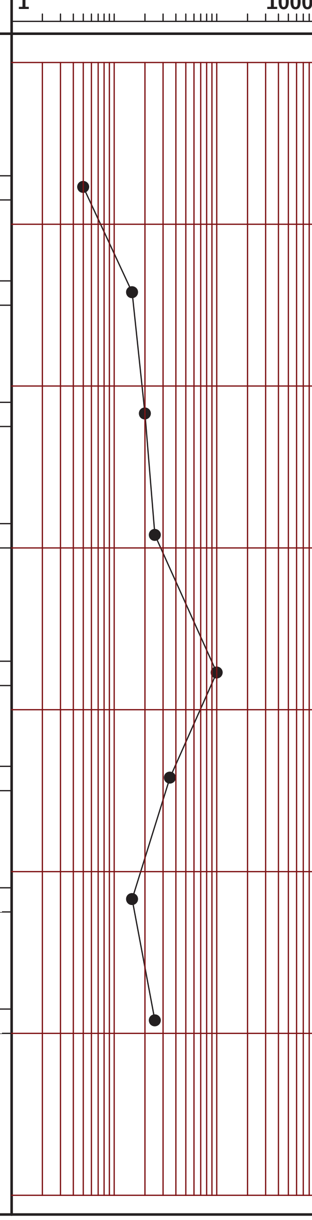
Monitoring Well: Bentonite; Silica Sand; 4.5 m slotted / 1.5 m solid 50 mm dia. PVC pipe

SAMPLE

Sample No.	Sample Type	% Recovery
1	G	50
2	G	50
3	G	50
4	G	50
5	G	75
6	G	75
7	G	100
8	G	100

TEST DATA

Combustible Organic Vapours (ppm)



Laboratory Analyses:

- Well Collar Elevation = 99.619 m
- WL = 96.590 m on 11/10/04
- Soil sample submitted for BTEX, PHC F1 to F4
- Soil sample submitted for BTEX, PHC F1 to F4 and Grain Size

Elevation (m): 99.7, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

TEST HOLE: PA-10

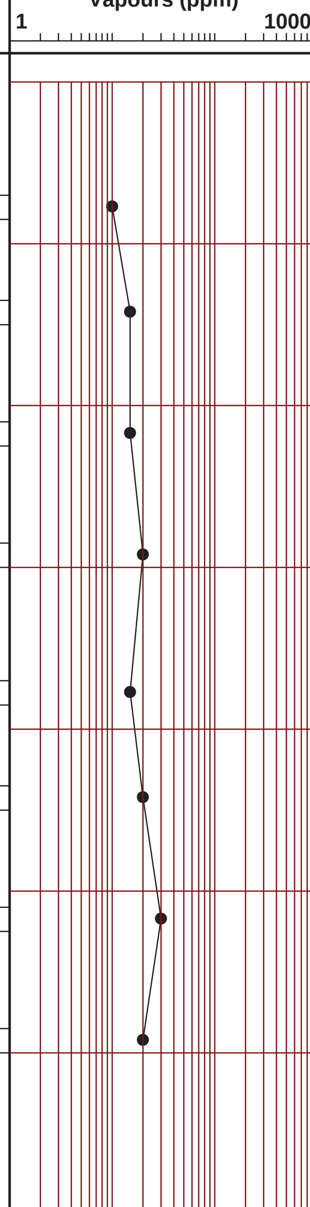
Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 1
Test Hole Location: 12.0 m W, 15.4 m N of NE corner of Hangar, 13 U 454332.7 E, 5896415.3 N	**Elev.:** 99.970 m

SUBSURFACE PROFILE / SAMPLE / TEST DATA

Depth (m)	Soil Description	Sample No.	Sample Type	% Recovery	Laboratory Analyses	Elevation (m)
0	**Ground Surface**					100.0
	CONCRETE				Well Collar Elevation = 99.868 m	
	SAND and GRAVEL (Fill) - brown - well graded - some fines - damp	1	G	60		
1	SILT - brown - some fine sand - damp, firm					99.0
	SAND - brown - fine grained, poorly graded - trace silt - damp, loose - no odour	2	G	60		
2	- trace black organics	3	G	75		98.0
	- with silt					
3	- wet	4	G	75	Soil sample submitted for BTEX, PHC F1 to F4	97.0
					WL = 96.603 m on 11/10/04	
	- fine to medium grained	5	G	70		
4		6	G	70		96.0
	- trace gravel					
5	CLAY and SILT - brown to grey - trace to with fine sand - moist to damp, firm to stiff - low plasticity	7	G	100	Soil sample submitted for BTEX, PHC F1 to F4	95.0
6	End of Environmental Test Hole @ 6.0 m. Seepage at 3.2 m. Monitoring well installed.	8	G	100		94.0
7						93.0

Monitoring Well: Bentonite; Silica Sand; 4.5 m slotted / 1.5 m solid 50 mm dia. PVC pipe

Combustible Organic Vapours (ppm)



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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

TEST HOLE: PA-11

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment	
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01	**Page:** 1 of 1
Test Hole Location: 1.25 m W of SW corner of Hangar, 13 U 454323.5 E, 5896378.5 N		**Elev.:** 99.888 m

SUBSURFACE PROFILE

Depth (m) | Soil Symbol | Soil Description | Monitoring Well

Ground Surface

ASPHALT

SAND and GRAVEL (Fill)
- brown
- well graded
- some fines
- damp

SILT
- brown
- some fine sand
- dry to moist, firm
- no odour

SAND
- brown/grey
- fine grained, poorly graded
- trace to some silt
- damp, loose
- trace oxidation
- fine to medium grained
- wet

CLAY
- brown to grey
- someto trace silt
- damp, stiff to very firm
- low plasticity
- grey

SILT
- grey
- trace fine sand and clay
- damp, stiff
- non-plastic
- no odour

End of Environmental Test Hole @ 6.0 m. Seepage at 3.2 m. Monitoring well installed.

Monitoring Well: Bentonite; Silica Sand; 4.5 m slotted / 1.5 m solid 50 mm dia. PVC pipe

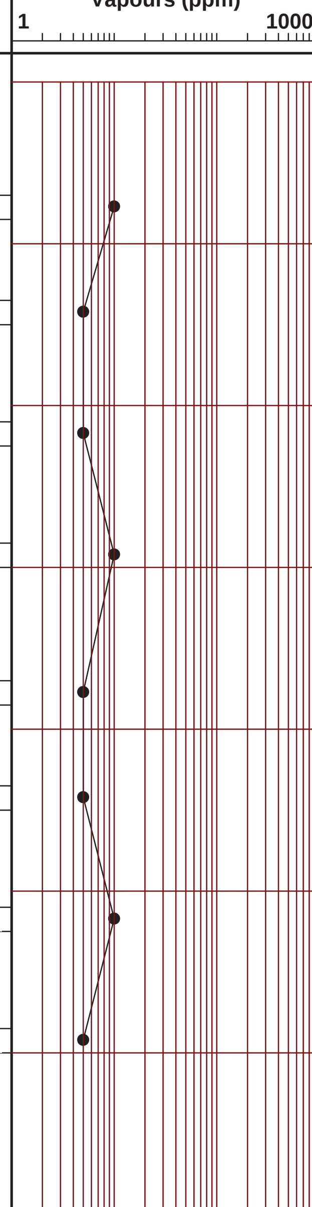
Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

SAMPLE

Sample No.	Sample Type	% Recovery
1	G	80
2	G	80
3	G	70
4	G	70
5	G	80
6	G	80
7	G	100
8	G	100

TEST DATA

Combustible Organic Vapours (ppm)



Laboratory Analyses

Well Collar Elevation = 99.809 m

Soil sample submitted for Metals, Glycols and Oil & Grease

Soil sample submitted for BTEX, PHC F1 to F4 and VOCs

WL = 96.597 m on 11/10/04

Elevation (m): 99.9, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/02	**Completion:** 11/08/02

TEST HOLE: PA-12

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 1
Test Hole Location: 7.75 m E, 9.4 m N of SE corner of Hangar, 13 U 454354.9 E, 5896387.9 N	**Elev.:** 99.725 m

SUBSURFACE PROFILE

Depth (m) | Soil Symbol | Soil Description | Monitoring Well

Ground Surface

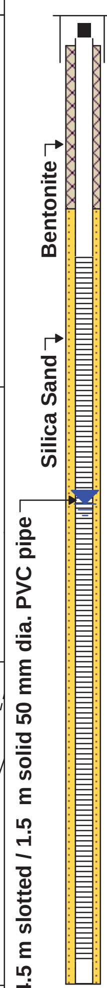
SILT
- brown
- trace to some fine sand
- dry to damp, firm
- no odour
- two 12 mm copper tubes at 0.5 m (former propane tank)

SAND
- brown
- fine grained, poorly graded
- trace silt
- damp
- fine to medium grained
- wet

SILT
- brown
- some clay
- damp, firm
- slight plasticity
- grey
- soft

CLAY
- grey
- trace to with silt
- damp, stiff to very firm
- low plasticity

End of Environmental Test Hole @ 6.0 m. Seepage at 3.2 m. Monitoring well installed.

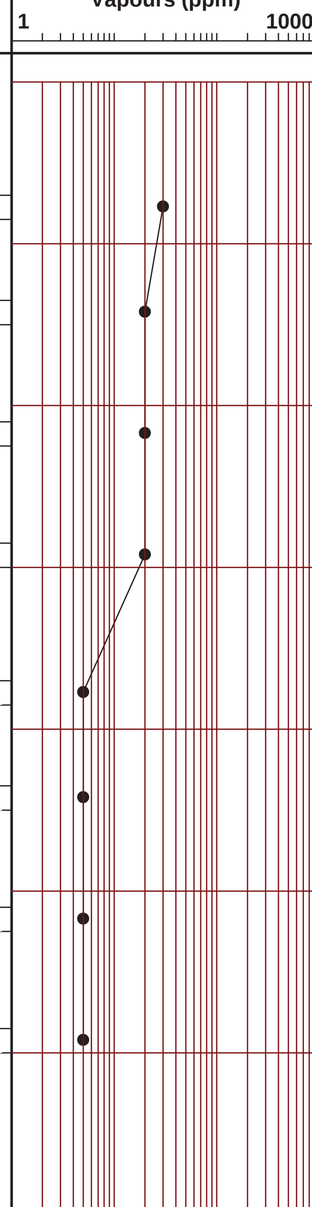


SAMPLE

Sample No.	Sample Type	% Recovery
1	G	80
2	G	80
3	G	60
4	G	60
5	G	100
6	G	100
7	G	100
8	G	100

TEST DATA

Combustible Organic Vapours (ppm)



Laboratory Analyses

Well Collar Elevation = 99.624 m

Soil sample submitted for BTEX, PHC F1 to F4

WL = 96.600 m on 11/10/04

Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

Elevation (m): 99.7, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/02	**Completion:** 11/08/02

TEST HOLE: PA-13

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 1
Test Hole Location: 1.75 m E of Hangar, 1.1 m S of fence, 13 U 454349.9 E, 5896403.8 N	**Elev.:** 99.912 m

SUBSURFACE PROFILE

Depth (m)	Soil Description
0	Ground Surface
0.0 – 1.6	SILT - brown - some fine sand, trace rootlets - dry to damp, firm - no odour
1.6 – 4.35	SAND - brown - fine grained, poorly graded - trace silt, compact - damp - 1 cm organic lense - medium grained - moderate to strong odour - sheen at 3.4 m - trace gravel
4.35 – 5.1	CLAY - brown/grey - with silt - damp, stiff - low plasticity - slight odour
5.1 – 6.0	SILT - grey - trace fine sand and clay - wet - faint odour
6.0	End of Environmental Test Hole @ 6.0 m. Seepage at 3.3 m. Monitoring well installed.

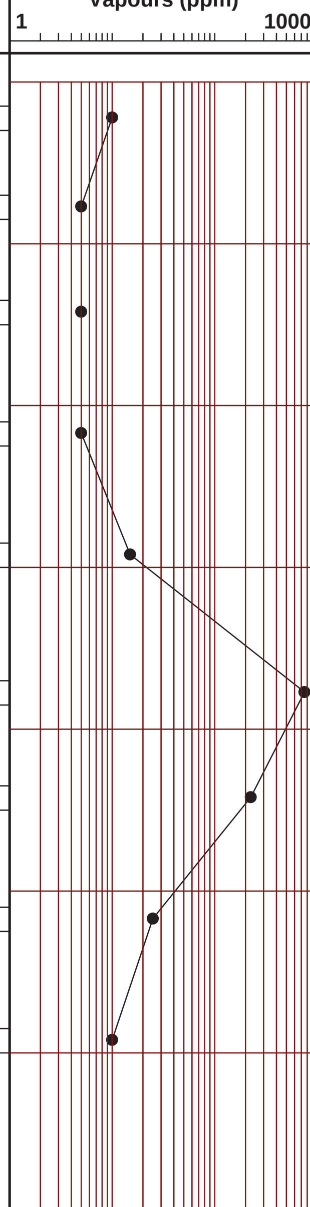
Monitoring Well: Bentonite; Silica Sand; 4.5 m slotted / 1.5 m solid 50 mm dia. PVC pipe

SAMPLE

Sample No.	Sample Type	% Recovery
1	G	90
2	G	90
3	G	90
4	G	75
5	G	75
6	G	100
7	G	100
8	G	100
9	G	100

TEST DATA

Combustible Organic Vapours (ppm)



Laboratory Analyses

- Well Collar Elevation = 99.817 m
- PL = 96.603 m on 11/10/04
- WL = 96.602 m on 11/10/04
- Soil sample submitted for BTEX, PHC F1 to F4 (Sample 6)
- Soil sample submitted for VOCs, Metals, Glycols, O&G and Grain Size (Sample 7)
- Soil sample submitted for BTEX, PHC F1 to F4 (Sample 8)

Elevation (m): 99.9, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

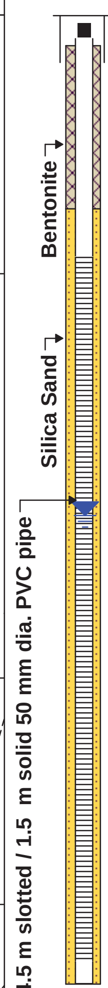
TEST HOLE: PA-14

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hangear. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 1
Test Hole Location: 24.5 m E, parallel to MW-1, 13 U 454372.6 E, 5896403.6 N	**Elev.:** 99.793 m

SUBSURFACE PROFILE

Depth (m)	Soil Description
	Ground Surface
0 – 1.6	SILT - brown - some fine sand, trace rootlets to 0.3 m - dry to damp, firm - no odour
1.6 – 4.1	SAND - brown - fine grained, poorly graded - trace silt - damp - no odour - wet - medium grained - trace gravel
4.1 – 5.5	CLAY - brown - some silt - damp, stiff - no odour - grey
5.5 – 6.0	SILT - grey - some fine sand, trace clay - moist to wet - no odour
	End of Environmental Test Hole @ 6.0 m. Seepage at 3.0 m. Monitoring well installed.

Monitoring Well:

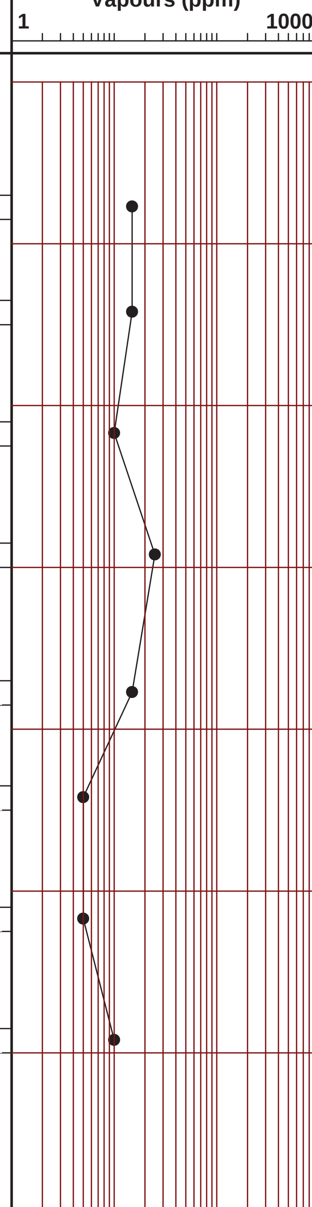


SAMPLE

Sample No.	Sample Type	% Recovery
1	G	90
2	G	90
3	G	75
4	G	75
5	G	100
6	G	100
7	G	100
8	G	100

TEST DATA

Combustible Organic Vapours (ppm)



Laboratory Analyses

Well Collar Elevation = 99.690 m

Soil sample submitted for BTEX, PHC F1 to F4

WL = 96.595 m on 11/10/04

Elevation (m): 99.8, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

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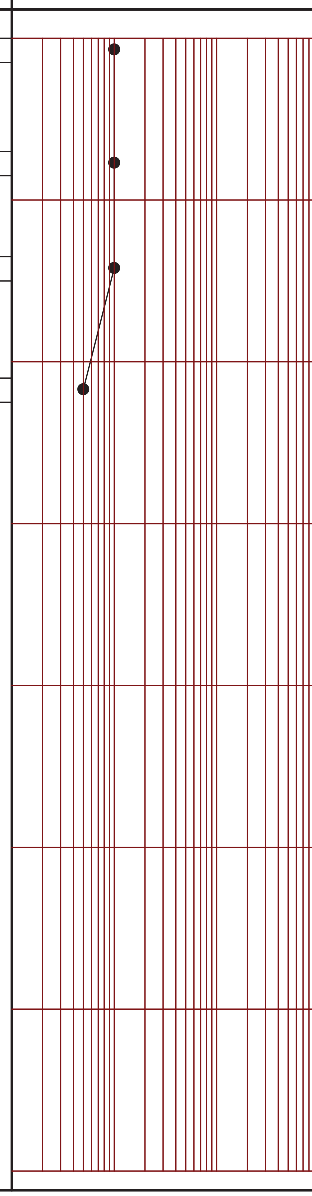
Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

TEST HOLE: PA-15

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 1
Test Hole Location: 0.4 m N of generator, 1.9 m E of Hangar, 13 U 454350.1 E, 5896391.3 N	**Elev.:** 99.818 m

SUBSURFACE PROFILE / SAMPLE / TEST DATA

Depth (m)	Soil Symbol	Soil Description	Monitoring Well	Sample No.	Sample Type	% Recovery	Combustible Organic Vapours (ppm) 1 – 1000	Laboratory Analyses	Elevation (m)
		Ground Surface							99.8
0		SILT - brown - some fine sand - dry to damp, firm - no odour		1		100		Soil sample submitted for BTEX, PHC F1 to F4	
				2		100			99.0
1				3		100			
2		SAND - brown - fine grained, poorly graded - trace silt - damp, loose - no odour		4		100			98.0
		End of Environmental Test Hole @ 2.25m. No seepage or sloughing.							97.0
3									
4									96.0
5									95.0
6									94.0
7									93.0



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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

TEST HOLE: PA-16

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment	
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01	**Page:** 1 of 1
Test Hole Location: 1.0 m E of generator, 13 U 454351.6 E, 5896389.4 N		**Elev.:** 99.815 m

SUBSURFACE PROFILE / SAMPLE / TEST DATA

Depth (m)	Soil Symbol	Soil Description	Monitoring Well	Sample No.	Sample Type	% Recovery	Combustible Organic Vapours (ppm) 1–1000	Laboratory Analyses	Elevation (m)
		Ground Surface							99.8
0		SILT - brown - some fine sand, rootlets to 0.3m - dry to damp, firm - no odour		1		100		Soil sample submitted for BTEX, PHC F1 to F4	
				2		100			99.0
1				3		100			
2		SAND - brown - fine grained, poorly graded - trace silt - damp, loose - no odour		4		100			98.0
		End of Environmental Test Hole @ 2.25m. No seepage or sloughing.							97.0
3									96.0
4									95.0
5									94.0
6									93.0
7									

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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - 125mm SSA	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

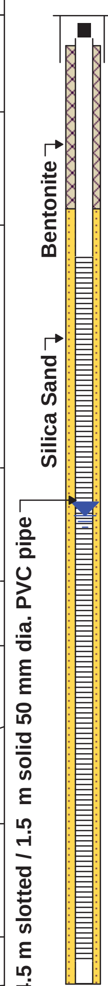
TEST HOLE: PA-17

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment	
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01	**Page:** 1 of 1
Test Hole Location: 38.4 m E, 25.8m N of NE corner of Hangar, 13 U 454386.6 E, 5896438.8 N		**Elev.:** 99.736 m

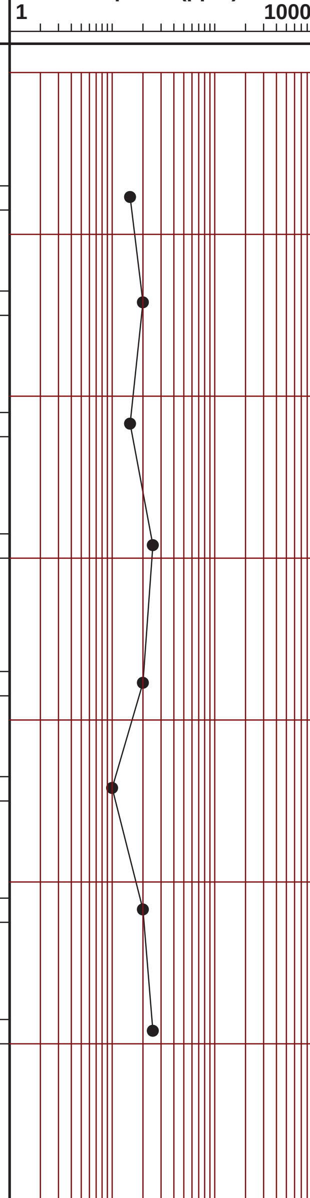
SUBSURFACE PROFILE / SAMPLE / TEST DATA

Depth (m)	Soil Description	Sample No.	Sample Type	% Recovery	Laboratory Analyses	Elevation (m)
0	Ground Surface				Well Collar Elevation = 99.639 m	99.7
0–0.6	SILT - brown - some fine sand, trace organics to 0.4 m - dry to damp, firm					
0.6–1.3	- brown/grey - damp, soft	1	G	75		99.0
1.3–2.8	SAND - brown - fine grained, poorly graded - trace silt - dry to damp - no odour	2	G	75		98.0
		3	G	90		
2.8–3.5	- some silt - moist, trace oxidation	4	G	90	Soil sample submitted for BTEX, PHC F1 to F4 WL = 96.543 m on 11/10/04	97.0
3.5–3.9	- brown/grey - fine to medium grained - wet, loose	5	G	100		96.0
3.9–4.4	SILT - brown - some clay, trace fine sand - damp, stiff					
4.4–5.0	CLAY - grey - damp, stiff - low plasticity	6	G	100		95.0
5.0–5.7	SILT - grey - some clay - damp, firm	7	G	100		
5.7–6.0	CLAY - as above	8	G	100		94.0
6	End of Environmental Test Hole @ 6.0 m. Seepage at 3.0 m. Monitoring well installed.					
7						93.0

Monitoring Well



Combustible Organic Vapours (ppm)



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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/08/03	**Completion:** 11/08/03

TEST HOLE: PA-18

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 1
Test Hole Location: 3.5 m E, 2.6 m S of junction of RCMP apron and Taxi 'B', 13 U 454364.9 E, 5896445.4 N	**Elev.:** 99.595 m

SUBSURFACE PROFILE

Ground Surface

Depth (m)	Soil Description
0 – 1.25	SILT - brown - some fine sand, trace organics to 0.3 m - damp
1.25 – 3.7	SAND - brown - fine grained, poorly graded - damp, loose - no odour - with dark brown organic lenses - trace to some silt - moist - slight odour @ 2.95 m - fine to medium grained - wet
3.7 – 4.2	- grey - fine grained, some silt - strong odour to 3.85m - wet, loose
4.2 – 4.5	- brown - medium grained - wet
4.5 – 5.2	SILT - brown - some very fine sand, trace clay - damp, firm - no odour
5.2 – 6.0	CLAY - grey - damp, very firm to stiff - high plasticity

End of Environmental Test Hole @ 6.0 m. Seepage at 3.0 m. Monitoring well installed.

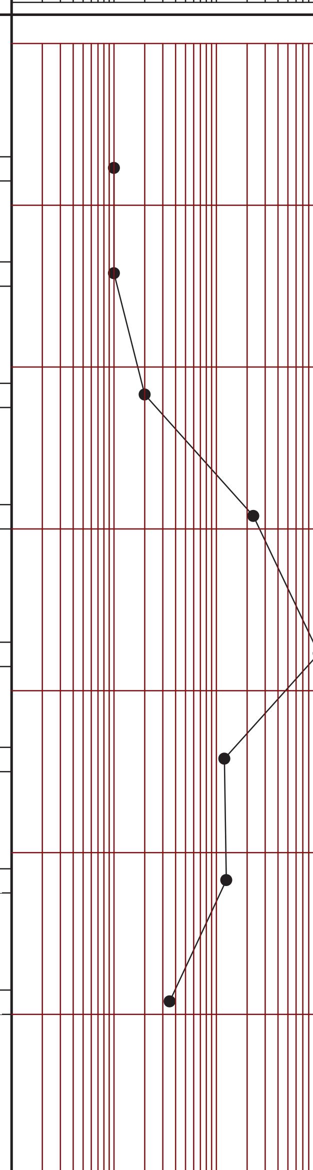
Monitoring Well: Bentonite; Silica Sand; 4.5 m slotted / 1.5 m solid 50 mm dia. PVC pipe

SAMPLE

Sample No.	Sample Type	% Recovery
1	G	90
2	G	90
3	G	80
4	G	80
5	G	80
6	G	80
7	G	100
8	G	100

TEST DATA

Combustible Organic Vapours (ppm)



Laboratory Analyses

- Well Collar Elevation = 99.448 m
- PL = 96.539 m on 11/10/04
- WL = 96.460 m on 11/10/04
- Soil sample submitted for BTEX, PHC F1 to F4 (sample 5)
- Soil sample submitted for BTEX, PHC F1 to F4 (sample 7)

Elevation (m): 99.6, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

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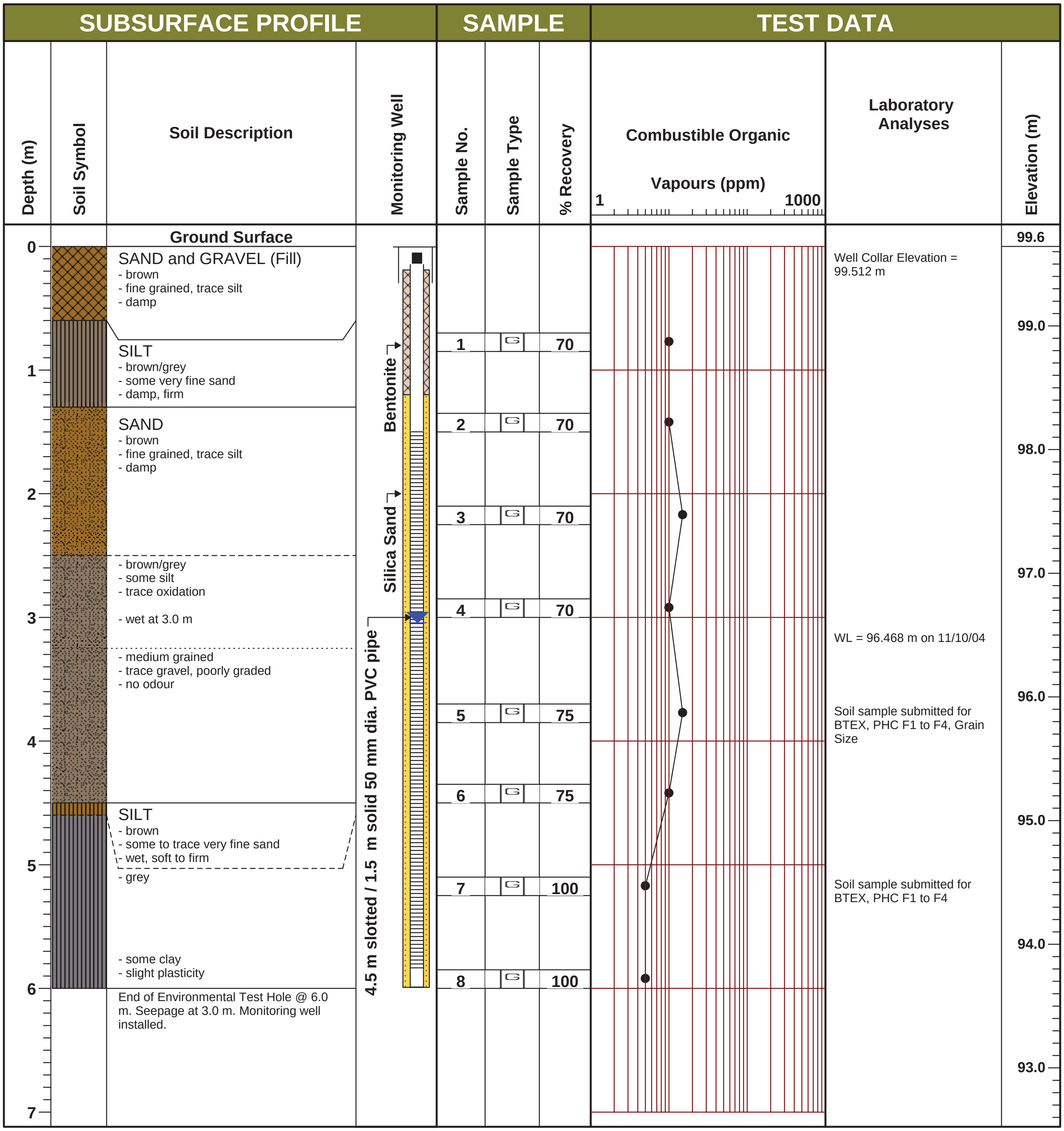
Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/10/03	**Completion:** 11/10/03

TEST HOLE: PA-19

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 1
Test Hole Location: 7.4 m W, 4.5 m N of junction of main apron and Taxi 'B', 13 U 454376.5 E, 5896468.6 N	**Elev.:** 99.643 m



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Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/10/03	**Completion:** 11/10/03

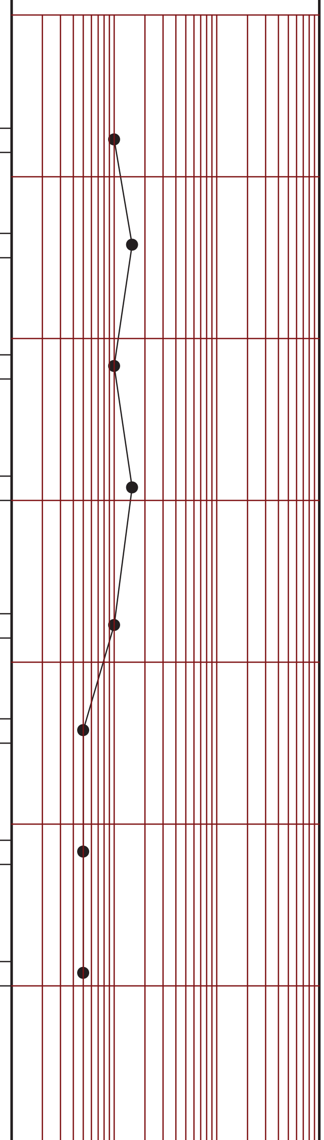
TEST HOLE: PA-20

Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01 — **Page:** 1 of 1
Test Hole Location: 4.0 m N of Taxi 'B', centerline of Hangar, 13 U 454333.2 E, 5896466.6 N	**Elev.:** 99.526 m

SUBSURFACE PROFILE / SAMPLE / TEST DATA

Depth (m)	Soil Description	Sample No.	Sample Type	% Recovery	Laboratory Analyses	Elevation (m)
0	Ground Surface					99.5
0–0.65	SAND (Fill) - brown - with gravel, some silt - damp				Well Collar Elevation = 99.444 m	
0.65–1.2	SILT - brown - very fine to fine grained - damp	1	G	90		
1.2–4.3	SAND - brown - very fine to fine grained - some silt lenses @ 1.0, 1.3, 1.9 m - damp - 1cm black organic lense at 2.2 m - trace oxidation to 2.35 m	2	G	90		
2.35	- fine to medium grained	3	G	70		
		4	G	70	Soil sample submitted for BTEX, PHC F1 to F4 WL = 96.516 m on 11/10/04	
3.7	- brown/grey	5	G	90		
4.3–5.75	CLAY - brown - damp, stiff - high plasticity	6	G	90		
		7	G	95		
5.75–6.0	SILT - grey - trace very fine sand, trace clay - damp, very firm	8	G	95		
	End of Environmental Test Hole @ 6.0 m. Seepage at 3.1 m. Monitoring well installed.					

Monitoring Well: Bentonite; Silica Sand; 4.5 m slotted / 1.5 m solid 50 mm dia. PVC pipe



Elevation (m): 99.5, 99.0, 98.0, 97.0, 96.0, 95.0, 94.0, 93.0

Depth (m): 0, 1, 2, 3, 4, 5, 6, 7

EGE Engineering Ltd.
Engineering, Geosciences and Environmental
511 Pepperloaf Cres., Winnipeg, Manitoba, R3R 1E6
Ph: (204) 226-7378; Fax: (204) 837-6473; e-mail: egegroup@mts.net

Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/10/03	**Completion:** 11/10/03

TEST HOLE: PA-21

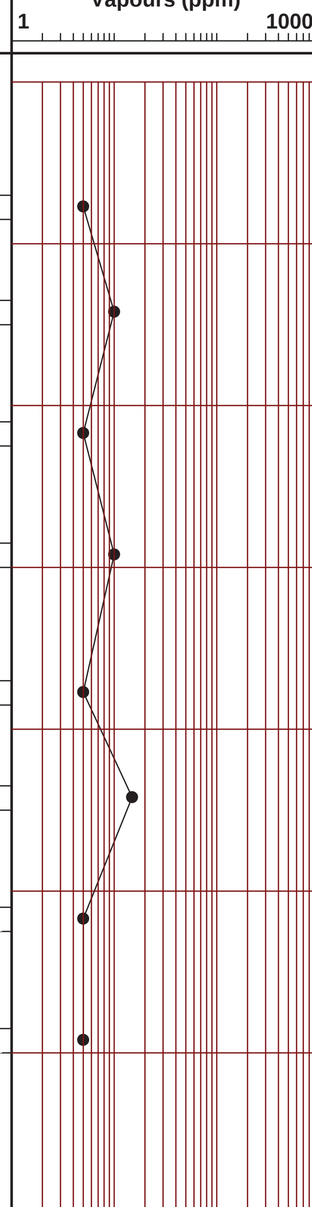
Client: Public Works & Government Services Canada	**Project:** 2011 Phase III Environmental Site Assessment	
Project Location: RCMP Hangar. Prince Albert, SK	**Project No:** 0126-036-01	**Page:** 1 of 1
Test Hole Location: 15.5 m N of Taxi 'B', 28 m W of Jnc of Apron and Taxi 'B', 13 U 454355.4 E, 5896478.5 N		**Elev.:** 99.745 m

SUBSURFACE PROFILE / SAMPLE / TEST DATA

Depth (m)	Soil Description	Sample No.	Sample Type	% Recovery	Laboratory Analyses	Elevation (m)
0	Ground Surface				Well Collar Elevation = 99.638 m	99.7
0–0.85	SILT - dark brown - some organics, trace sand - dry, no odour - brown	1	G	85		99.0
0.85–4.9	SAND - light brown to brown - very fine grained - with to trace silt - dry to damp	2	G	85		98.0
	- 5 mm thick black organic lense	3	G	75		
	- some silt - trace oxidation, very damp	4	G	75		97.0
3	- fine to medium grained - trace fines - wet				WL = 96.465 m on 11/10/04	
	- trace oxidation	5	G	75		96.0
	- brown/grey - some gravel	6	G	75	Soil sample submitted for BTEX, PHC F1 to F4	95.0
4.9–6.0	SILT - brown - trace very fine sand - trace clay - very damp, stiff - low plasticity	7	G	100		94.0
6	End of Environmental Test Hole @ 6.0 m. Seepage at 3.3 m. Monitoring well installed.	8	G	100		93.0

Monitoring Well: Bentonite; Silica Sand; 4.5 m slotted / 1.5 m solid 50 mm dia. PVC pipe

Combustible Organic Vapours (ppm)



EGE Engineering Ltd.
Engineering, Geosciences and Environmental
511 Pepperloaf Cres., Winnipeg, Manitoba, R3R 1E6
Ph: (204) 226-7378; Fax: (204) 837-6473; e-mail: egegroup@mts.net

Drilling Contractor: Intercore Environmental Services Ltd.	
Drilling Method: GeoProbe 7822 DT - Continuous Sampler	
Logged By: A.Passalis	**Checked By:** L.Bielus
Start Date: 11/10/03	**Completion:** 11/10/03

APPENDIX D

DISPOSAL OF SOIL CUTTINGS

APPLICATION AND LANDFILL TICKETS

WORK ORDER

City of Prince Albert

W.O. No. 13-0-8-

Date ______

Charge Account **CUSTOM: Contaminated Soil** No. ______

Job Card Req'd Yes ☑ No ☐ Dept Issued to: Works ☐ Traffic ☐ Parks & Rec ☐ Misc ______

Work to be done:

Sign Work Order

Cost is $25.00/tonne for contaminated soil with a minimum charge of $200.00
Material received must be free of PCB's or any other hazardous material
The materials shall be only of hydrocarbonate base of gasoline or diesel fuels only

Estimated volume of soil: 20 - 30 cubic metres

Approximate date of hauling: 03 - 04/10/2011

Location of Material: 190 Airport Road, Prince Albert, SK

Name of Hauling Company: Demyterko Enterprises

** **Test results must be submitted prior to delivery of contaminated soil at the Landfill.**

Drawings: Authority: Bylaw No. ______ Resolution No. ______

Estimated Cost:		
Labour		$
Equipment		$
Materials		$
Other		$
Total Est.		**$**

Special Material or Direction:

FOR OFFICE USE ONLY:

Designated Numbered Site at Landfill:

Please sign below:

I hereby authorize the above work be done at my expense.

Larry Bielus, P.Eng. (EGE Engineering Ltd.)
(Name)

511 Pepperloaf Cres., Winnipeg, MB R3R 1E6
(Address)

Deposit $ ______ Receipt No. ______

Ordered By Rob Burns/ka
(Signature)

Approved by City Engineer ______
(Initial)

Work Complete ______
(Foreman)

W.O. Closed ______
(Engineer)

Copy 1 - To General Foreman
Copy 2 - To Public Works Office
Copy 3 - To Foreman on the Job

COPY 1

City of Prince Albert Landfill
Phone: (306)953-4975

TICKET #
266075

October 4, 2011

Vehicle Id:	DMY#105 / 549 FLR
Account:	DMY01 DMYTERKO ENT.
Origin:	The City of Prince Albert
To/From:	Contaminated Soil Site
Material:	Contaminated Soil

Rate:SOIHC/Hydrocarbon Contaminated Soils
In @ 11:30:40 Out @ 11:30:56

Gross	20105
Tare	9485

Net **10620 Kg** **Amount** **$265.50**

Payment Method : ON ACCOUNT
Signature Chief

City of Prince Albert Landfill
Phone: (306)953-4975

TICKET #
266060

October 4, 2011

Vehicle Id:	DMY#105 / 549 FLR
Account:	DMY01 DMYTERKO ENT.
Origin:	The City of Prince Albert
To/From:	Contaminated Soil Site
Material:	Contaminated Soil

Rate:SOIHC/Hydrocarbon Contaminated Soils
In @ 10:24:05 Out @ 10:26:06

Gross	15635
Tare	9485

Net **6150 Kg** **Amount** **$153.75**

Payment Method : ON ACCOUNT
Signature Chief

DMYTERKO ENTERPRISES LTD.
RR 5 23-23 Prince Albert, Sask. 764-0336
Excavating - Trenching - Fill Dirt - Sand

OCT 4 20 11

M EGE ENGINEERING

JOB NO. AIRPORT

UNIT NO.

GST #R101424117

LANDFILL TICKETS		
FOR HAULING		
CONTAMINATED SOIL		
FROM AIRPORT		
TICKET # 266075	265	50
TICKET # 266060	153	75
SUBTOTAL	419	25
PO# 149 PST	—	
GST	—	
No 144132 TOTAL	419	25

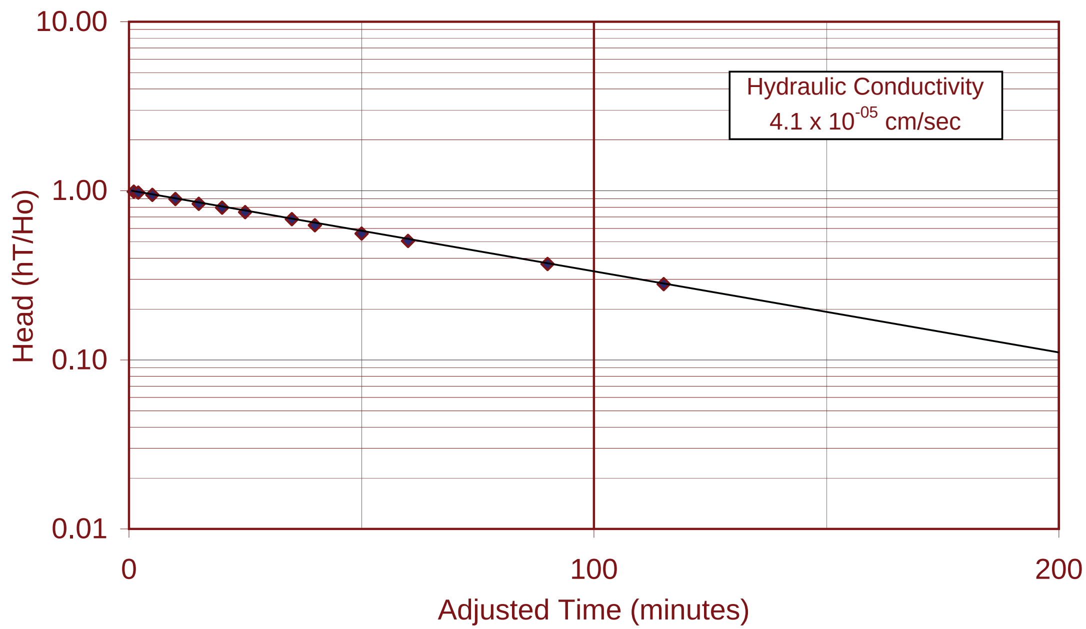
ACTION PRINTING, PRINCE ALBERT

APPENDIX E

HYDRAULIC CONDUCTIVITY PLOT

Project: Phase III ESA
Site: RCMP Hangar
Location: Prince Albert, SK
Test Date: 04-Aug-11
Client: PWGSC
Project Number: 0125-036-01
Well Number: PA-04

Aquifer Thickness: 1.5 metres
Screen Length: 1.5 metres
Casing Radius: 0.05 metres
Well Bore Radius: 0..125 metres
Static Water Level: 3.025 metres
Column Height: 7.275 metres
Anisotrophy Ratio: 1
Time Adjustment: n/a
Number of Readings: 14
Maximum head: 10.020 metres
Minimum head: 0.00 metres
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice



Reading	Time (minutes)	Adjusted Time (minutes)	Drawdown (metres)	Head (metres)	Head Ratio
1	0	0	10.020	7.00	1.0000
2	1	1	9.935	6.91	0.9878
3	2	2	9.861	6.84	0.9773
4	5	5	9.638	6.61	0.9454
5	10	10	9.269	6.24	0.8926
6	15	15	8.875	5.85	0.8363
7	20	20	8.583	5.56	0.7946
8	25	25	8.255	5.23	0.7477
9	35	35	7.782	4.76	0.6801
10	40	40	7.400	4.38	0.6254
11	50	50	6.936	3.91	0.5591
12	60	60	6.565	3.54	0.5061
13	90	90	5.610	2.59	0.3695
14	115	115	4.988	1.96	0.2806

EGE

APPENDIX F

GROUNDWATER WELL RECORDS

28/11/2011
(OneWellPerPage)

Saskatchewan Watershed Authority

One Well Per Page

Land Location **226 049 11NE00**
WWDR# **024332**

PRINCE ALBERT

Completion: **22/11/1940 12:00:00AM**

Licensed Ground Water
Water Rights # cwtrrights

Water Quality
024332

RM **491**
MB **07**
SB **29**
NTSMAP **73H04**

Well Location

LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
00	**NE**	**11**	**049**	**26**	**2**		

ZONE	EASTING	NORTHING	SOURCE	ACCURACY
13	**454100**	**5896400**	**Measured**	**+/- 1m**

Location of Well (in Quarter)
1,040.00 ft from N/S Boundary **N**
700.00 ft from E/W Boundary **E**

Well Information

Driller # **ABBOTT & HENNING**
Water Use **Municipal**
Hole #
Well Use **Withdrawal**
Installation Method **Drilled**
Depth **45.00** ft
Water Level **25.00** ft
Bit **4.00** inches
Flowing Head **0.00** ft

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description
0.00	**0.00**	**4.00**	**Steel**
0.00	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	

Pump Test
Draw Down **4.00** ft
Duration **0.00** hrs
Pumping Rate **93.00** igpm
Temp **0.00** deg. F
Elevation **1,410.00** ft

Rec. Pumping Rate **90.00**
Intake **0.00**
Aquifer
E-Log **No**
Phys **D02**

Lithology List

Depth (ft)	Material	Colour	Description
2.00	**Sandy Clay**	**Unknown**	**Unknown**
14.00	**Sand**	**Unknown**	**Fine**
45.00	**Sand & Gravel**	**Unknown**	**Coarse**

Saskatchewan Watershed Authority

One Well Per Page

28/11/2011
(OneWellPerPage)

Land Location	**226 049 11NE00**
WWDR#	**054809**

MORGAN, BRYN

Completion: **14/07/1978 12:00:00AM**

Licensed Ground Water

Water Rights # cwtrrights

Water Quality
054809

RM	
MB	**07**
SB	**29**
NTSMAP	**73H00**

Well Location

LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
00	**NE**	**11**	**049**	**26**	**2**		

ZONE	EASTING	NORTHING	SOURCE	ACCURACY

Location of Well (in Quarter)
0.00 ft from N/S Boundary
0.00 ft from E/W Boundary

Well Information

Driller #	**PRAIRIE WATER LTD**	
Water Use	**Domestic**	
Hole #	**001**	
Well Use	**Withdrawal**	
Installation Method	**Bored**	
Depth	**32.00**	ft
Water Level	**0.00**	ft
Bit	**36.00**	inches
Flowing Head	**0.00**	ft

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description
32.00	**30.00**	**36.00**	**Porous Concrete**
0.00	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	

Pump Test

Draw Down	**0.00**	ft
Duration	**0.00**	hrs
Pumping Rate	**0.00**	igpm
Temp	**0.00**	deg. F
Elevation	**1,455.00**	ft

Rec. Pumping Rate	**0.00**
Intake	**0.00**
Aquifer	
E-Log	**No**
Phys	**D02**

Lithology List

Depth (ft)	Material	Colour	Description
32.00	**Sand**	**Brown**	**Fine**

Saskatchewan Watershed Authority

One Well Per Page

28/11/2011
(OneWellPerPage)

Land Location	**226 049 11NE00**
WWDR#	**060879**

MORGAN, BRYAN

Completion: **14/07/1978 12:00:00AM**

Licensed Ground Water

Water Rights # cwtrrights

Water Quality
060879

RM
MB **07**
SB **29**
NTSMAP **73H00**

Well Location

LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
00	**NE**	**11**	**049**	**26**	**2**		

ZONE	EASTING	NORTHING	SOURCE	ACCURACY

Location of Well (in Quarter)
0.00 ft from N/S Boundary
0.00 ft from E/W Boundary

Well Information

Driller #	**PRAIRIE WATER LTD**
Water Use	**Domestic**
Hole #	**001**
Well Use	**Withdrawal**
Installation Method	**Bored**
Depth	**32.00** ft
Water Level	**0.00** ft
Bit	**36.00** inches
Flowing Head	**0.00** ft

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description
32.00	**30.00**	**36.00**	**Porous Concrete**
0.00	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	

Pump Test

Draw Down	**0.00** ft
Duration	**0.00** hrs
Pumping Rate	**0.00** igpm
Temp	**0.00** deg. F
Elevation	**1,475.00** ft

Rec. Pumping Rate	**0.00**
Intake	**0.00**
Aquifer	
E-Log	**No**
Phys	**D02**

Lithology List

Depth (ft)	Material	Colour	Description
32.00	**Topsoil**	**Unknown**	**Unknown**

One Well Per Page

Land Location **226 049 11NE00**
WWDR# **096816**

BARZEELES, BILL

Completion: **14/08/1989 12:00:00AM**

Licensed Ground Water
Water Rights # cwtrrights

Water Quality
096816

RM
MB **07**
SB **29**
NTSMAP **73H00**

Well Location

LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
00	**NE**	**11**	**049**	**26**	**2**		

ZONE	EASTING	NORTHING	SOURCE	ACCURACY

Location of Well (in Quarter)
0.00 ft from N/S Boundary
0.00 ft from E/W Boundary

Well Information

Driller # **GLENWELL DRILLING LTD**
Water Use **Domestic**
Hole # **1**
Well Use **Withdrawal**
Installation Method **Bored**
Depth **57.00** ft
Water Level **0.00** ft
Bit **0.00** inches
Flowing Head **0.00** ft

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description
59.00	**57.00**	**30.00**	**Fiberglass**
0.00	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	

Pump Test
Draw Down **0.00** ft
Duration **0.00** hrs
Pumping Rate **0.00** igpm
Temp **44.00** deg. F
Elevation **1,400.00** ft

Rec. Pumping Rate **10.00**
Intake **53.00**
Aquifer
E-Log **No**
Phys **D02**

Lithology List

Depth (ft)	Material	Colour	Description
37.00	**Sand**	**Brown**	**Dry**
39.00	**Silt**	**Grey**	**Wet**
48.00	**Sand**	**Grey**	**Wet**
55.00	**Till**	**Black**	**Unknown**
57.00	**Sand**	**Grey**	**Wet**

Saskatchewan Watershed Authority

One Well Per Page

28/11/2011
(OneWellPerPage)

Land Location **226 049 13SW00**
WWDR# **024333**

MORGAN, G D

Completion: **22/09/1964 12:00:00AM**

Licensed Ground Water
Water Rights # cwtrrights

Water Quality
024333

RM
MB **07**
SB **29**
NTSMAP **73H00**

Well Location

LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
00	**SW**	**13**	**049**	**26**	**2**		

ZONE	EASTING	NORTHING	SOURCE	ACCURACY

Location of Well (in Quarter)
0.00 ft from N/S Boundary
0.00 ft from E/W Boundary

Well Information

Driller # **PRAIRIE WATER LTD**
Water Use **Domestic**
Hole #
Well Use **Water Test Hole**
Installation Method **Bored**
Depth **50.00** ft
Water Level **0.00** ft
Bit **36.00** inches
Flowing Head **0.00** ft

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description
0.00	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	

Pump Test
Draw Down **0.00** ft
Duration **0.00** hrs
Pumping Rate **0.00** igpm
Temp **0.00** deg. F
Elevation **1,400.00** ft

Rec. Pumping Rate **0.00**
Intake **0.00**
Aquifer
E-Log **No**
Phys **D02**

Lithology List

Depth (ft)	Material	Colour	Description
1.00	**Topsoil**	**Unknown**	**Unknown**
5.00	**Silty Clay**	**Yellow**	**Unknown**
23.00	**Sand**	**Brown**	**Unknown**
50.00	**Silt**	**Unknown**	**Unknown**

28/11/2011
(OneWellPerPage)

Saskatchewan Watershed Authority

One Well Per Page

Land Location **226 049 13SW00**
WWDR# **110587**

BEULAH LAND BAPTIST CHRU

Completion: **04/06/1999 12:00:00AM**

Licensed Ground Water
Water Rights # cwtrrights

Water Quality
110587

RM **461**
MB **07**
SB **29**
NTSMAP **73H04**

Well Location

LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
00	**SW**	**13**	**049**	**26**	**2**		

ZONE	EASTING	NORTHING	SOURCE	ACCURACY

Location of Well (in Quarter)
200.00 ft from N/S Boundary **S**
30.00 ft from E/W Boundary **W**

Well Information

Driller # **NORTHERN DRILLING LTD**
Water Use **Domestic**
Hole # **001**
Well Use **Withdrawal**
Installation Method **Drilled**
Depth **62.00** ft
Water Level **20.00** ft
Bit **5.10** inches
Flowing Head **0.00** ft

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description
55.00	**53.00**	**5.00**	**P.V.C.**
0.00	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
5.00	**58.00**	**4.00**	**8.00**	**Stainless Steel**
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	

Pump Test
Draw Down **29.00** ft
Duration **24.00** hrs
Pumping Rate **10.00** igpm
Temp **41.00** deg. F
Elevation **1,475.00** ft

Rec. Pumping Rate **10.00**
Intake **51.00**
Aquifer
E-Log **Yes**
Phys **D02**

Lithology List

Depth (ft)	Material	Colour	Description
1.00	**Topsoil**	**Unknown**	**Unknown**
6.00	**Clay**	**Brown**	**Unknown**
14.00	**Sand**	**Brown**	**Fine**
24.00	**Sand**	**Brown**	**Medium**
25.00	**Clay**	**Grey**	**Unknown**
40.00	**Sand**	**Brown**	**Coarse**
52.00	**Sand**	**Grey**	**Medium**
58.00	**Sand**	**Grey**	**Coarse**
62.00	**Clay**	**Grey**	**Unknown**

Saskatchewan Watershed Authority

One Well Per Page

28/11/2011
(OneWellPerPage)

Land Location **226 048 24NE00**
WWDR# **024317**

KICZAK, ALEX

Completion: **28/07/1967 12:00:00AM**

Licensed Ground Water
Water Rights # cwtrrights

Water Quality
024317

RM
MB **07**
SB **29**
NTSMAP **73H00**

Well Location

LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
00	**NE**	**24**	**048**	**26**	**2**		

ZONE	EASTING	NORTHING	SOURCE	ACCURACY

Location of Well (in Quarter)
800.00 ft from N/S Boundary **N**
800.00 ft from E/W Boundary **W**

Well Information

Driller # **PRAIRIE WATER LTD**
Water Use **Domestic**
Hole #
Well Use **Withdrawal**
Installation Method **Bored**
Depth **46.00** ft
Water Level **0.00** ft
Bit **36.00** inches
Flowing Head **0.00** ft

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description
0.00	**46.00**	**36.00**	**Porous Concrete**
0.00	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	

Pump Test
Draw Down **0.00** ft
Duration **0.00** hrs
Pumping Rate **0.00** igpm
Temp **0.00** deg. F
Elevation **0.00** ft

Rec. Pumping Rate **3.00**
Intake **40.00**
Aquifer
E-Log **No**
Phys **D02**

Lithology List

Depth (ft)	Material	Colour	Description
21.00	**Clay**	**Brown**	**Unknown**
32.00	**Clay**	**Grey**	**Unknown**
45.00	**Silt**	**Grey**	**Sandy**
46.00	**Silt**	**Grey**	**Unknown**

Saskatchewan Watershed Authority

One Well Per Page

Land Location	**226 048 24NE00**
WWDR#	**024318**

KICZAK, ALEX

Completion: **28/07/1967 12:00:00AM**

Licensed Ground Water

Water Rights # cwtrrights

Water Quality
024318

RM	
MB	**07**
SB	**29**
NTSMAP	**73H00**

Well Location

LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
00	**NE**	**24**	**048**	**26**	**2**		

ZONE	EASTING	NORTHING	SOURCE	ACCURACY

Location of Well (in Quarter)

600.00 ft from N/S Boundary **N**

800.00 ft from E/W Boundary **E**

Well Information

Driller #	**PRAIRIE WATER LTD**
Water Use	**Domestic**
Hole #	
Well Use	**Water Test Hole**
Installation Method	**Bored**
Depth	**60.00** ft
Water Level	**0.00** ft
Bit	**36.00** inches
Flowing Head	**0.00** ft

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description
0.00	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	
0.00	**0.00**	**0.00**	**0.00**	

Pump Test

Draw Down	**0.00** ft
Duration	**0.00** hrs
Pumping Rate	**0.00** igpm
Temp	**0.00** deg. F
Elevation	**0.00** ft

Rec. Pumping Rate	**0.00**
Intake	**0.00**
Aquifer	
E-Log	**No**
Phys	**D02**

Lithology List

Depth (ft)	Material	Colour	Description
11.00	**Clay**	**Brown**	**Unknown**
60.00	**Clay**	**Blue**	**Unknown**

Subject: RE: Potable Water at Airport
From: Gayle Sommerfelt <gsommerfelt@citypa.com>
Date: 28/11/2011 12:32 PM
To: "'david.klassen@mymts.net'" <david.klassen@mymts.net>

All the properties along the access road (Veteran's Way) are serviced with City water and sewer.

In 1940 The Prince Albert Airport was constructed by the Dept. of National Defense as a flying training school under the British Commonwealth Air Training Program, I am assuming this was the municipal well you are referring to; The site is still at the Airport and the well is dry so they tell me.

Hope this info helps.
Gayle

From: david.klassen@mymts.net [mailto:david.klassen@mymts.net]
Sent: Monday, November 28, 2011 11:10 AM
To: Gayle Sommerfelt
Subject: Potable Water at Airport

Hi Gayle, I just want to confirm that the airport (and all buildings on the airport lands) are serviced by piped City of Prince Albert municipal water (from the water treatment plant). Groundwater well database records indicate that a municipal well is located at the airport site, but I am assuming it is no longer used. The well was drilled in 1940. Can you shed any light on this?

David
--

David Klassen, P.Geo.
Environmental Scientist

EGE Engineering Ltd.
Engineering, Geosciences and Environmental
511 Pepperloaf Crescent
Winnipeg, Manitoba
R3R 1E6

Ph:(204) 612-0944
Fax: (204) 837-6473
e-mail:david.klassen@mts.net

APPENDIX G
ANALYTICAL REPORTS

Maxxam

Success Through Science®

Your Project #: 0125-036-01, RCMP PRINCE ALBER
Your C.O.C. #: A074133, A074134

Attention: ANDREW PASSALIS
EGE ENGINEERING LTD.
511 PEPPERLOAF CRESENT
WINNIPEG, MB
CANADA R3R 1E6

Report Date: 2011/08/12

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B171800
Received: 2011/08/05, 12:30

Sample Matrix: Water
Samples Received: 20

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS	15	N/A	2011/08/09	CAL SOP-00190	CCME CWS, EPA 8260C
BTEX/F1 in Water by HS GC/MS	4	N/A	2011/08/12	CAL SOP-00190	CCME CWS, EPA 8260C
Cadmium - low level CCME - Dissolved	4	N/A	2011/08/11	AB SOP-00043	EPA 200.8
CCME Hydrocarbons (F2-F4 in water)	8	2011/08/08	2011/08/09	CAL SOP-00086 AB WI-00017	EPA3510C/CCME PHCCWS
CCME Hydrocarbons (F2-F4 in water)	7	2011/08/08	2011/08/10	CAL SOP-00086 AB WI-00017	EPA3510C/CCME PHCCWS
CCME Hydrocarbons (F2-F4 in water)	4	2011/08/10	2011/08/12	CAL SOP-00086 AB WI-00017	EPA3510C/CCME PHCCWS
Glycols in Water by GC/FID	4	N/A	2011/08/11	CAL SOP-00093	EPA 8015 D
Elements by ICP - Dissolved	4	N/A	2011/08/11	AB SOP-00042	EPA 200.7
Elements by ICPMS - Dissolved	4	N/A	2011/08/11	AB SOP-00043	EPA 200.8
Oil and Grease by IR	3	2011/08/10	2011/08/12	CAL SOP-00096	SM 5520C
Total Trihalomethanes Calculation	3	N/A	2011/08/09	CAL SOP-00104	EPA 8260 C
VOCs in Water by P&T GC/MS (Std List)	3	N/A	2011/08/08	CAL SOP-00104	EPA 8260 C

Encryption Key

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

Cynny Hagen, Project Manager
Email: CHagen@maxxam.ca
Phone# (403) 735-2239 Ext:2239

==
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

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6526 PA-03							
Sampling Date 2011/08/04							
Matrix WATER							
RESULTS OF CHEMICAL ANALYSES OF WATER							
Low Level Elements							
Dissolved Cadmium (Cd)	0.35	0.005	ug/L	0.000			5069072
ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)							
Elements							
Dissolved Aluminum (Al)	0.055	0.001	mg/L	0.006		TDB	5079506
Dissolved Antimony (Sb)	<0.0006	0.0006	mg/L			TDB	5079506
Dissolved Arsenic (As)	0.0012	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Barium (Ba)	0.38	0.01	mg/L	0.01		VGG	5081631
Dissolved Beryllium (Be)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Boron (B)	0.04	0.02	mg/L	0.01		VGG	5081631
Dissolved Calcium (Ca)	96	0.3	mg/L	4.8	54.4	VGG	5081631
Dissolved Chromium (Cr)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Cobalt (Co)	0.010	0.0003	mg/L	0.0000		TDB	5079506
Dissolved Copper (Cu)	0.0031	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Iron (Fe)	0.20	0.06	mg/L	0.01		VGG	5081631
Dissolved Lead (Pb)	0.0014	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Lithium (Li)	0.02	0.02	mg/L	0.00		VGG	5081631
Dissolved Magnesium (Mg)	33	0.2	mg/L	2.7	30.7	VGG	5081631
Dissolved Manganese (Mn)	2.6	0.004	mg/L	0.095		VGG	5081631
Dissolved Molybdenum (Mo)	0.022	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Nickel (Ni)	0.013	0.0005	mg/L	0.0000		TDB	5079506
Dissolved Phosphorus (P)	<0.1	0.1	mg/L			VGG	5081631
Dissolved Potassium (K)	11	0.3	mg/L	0.3	3.4	VGG	5081631
Dissolved Selenium (Se)	<0.0002	0.0002	mg/L			TDB	5079506
Dissolved Silicon (Si)	11	0.1	mg/L	1.5		VGG	5081631
Dissolved Silver (Ag)	<0.0001	0.0001	mg/L			TDB	5079506
Dissolved Sodium (Na)	22	0.5	mg/L	1.0	11.4	VGG	5081631
Dissolved Strontium (Sr)	0.62	0.02	mg/L	0.01		VGG	5081631
Dissolved Sulphur (S)	3.6	0.2	mg/L	0.2		VGG	5081631
Dissolved Thallium (Tl)	<0.0002	0.0002	mg/L			TDB	5079506
Dissolved Tin (Sn)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Titanium (Ti)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Uranium (U)	0.0003	0.0001	mg/L	0.0000		TDB	5079506
Dissolved Vanadium (V)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Zinc (Zn)	0.009	0.003	mg/L	0.000		TDB	5079506
GLYCOLS BY GC-FID (WATER)							
Glycols							
Ethylene Glycol	<10	10	mg/L			WP0	5073309
Diethylene Glycol	<5	5	mg/L			WP0	5073309
Triethylene Glycol	<10	10	mg/L			WP0	5073309
Tetraethylene Glycol	<10	10	mg/L			WP0	5073309
Propylene Glycol	<10	10	mg/L			WP0	5073309
Methyl Sulfone (sur.)	97	70 - 130	%			WP0	5073309
BE6527 PA-04							
Sampling Date 2011/08/04							
Matrix WATER							
RESULTS OF CHEMICAL ANALYSES OF WATER							
Low Level Elements							
Dissolved Cadmium (Cd)	0.046	0.005	ug/L	0.000			5069072
ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)							
Elements							
Dissolved Aluminum (Al)	0.10	0.001	mg/L	0.011		TDB	5079506
Dissolved Antimony (Sb)	<0.0006	0.0006	mg/L			TDB	5079506
Dissolved Arsenic (As)	0.0047	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Barium (Ba)	0.04	0.01	mg/L	0.00		VGG	5081631

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6527 PA-04							
Sampling Date 2011/08/04							
Matrix WATER							
ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)							
Elements							
Dissolved Beryllium (Be)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Boron (B)	0.40	0.02	mg/L	0.11		VGG	5081631
Dissolved Calcium (Ca)	150	0.3	mg/L	7.5	48.7	VGG	5081631
Dissolved Chromium (Cr)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Cobalt (Co)	0.0021	0.0003	mg/L	0.0000		TDB	5079506
Dissolved Copper (Cu)	0.0013	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Iron (Fe)	<0.06	0.06	mg/L			VGG	5081631
Dissolved Lead (Pb)	<0.0002	0.0002	mg/L			TDB	5079506
Dissolved Lithium (Li)	0.16	0.02	mg/L	0.02		VGG	5081631
Dissolved Magnesium (Mg)	37	0.2	mg/L	3.0	19.5	VGG	5081631
Dissolved Manganese (Mn)	0.57	0.004	mg/L	0.021		VGG	5081631
Dissolved Molybdenum (Mo)	0.010	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Nickel (Ni)	0.0064	0.0005	mg/L	0.0000		TDB	5079506
Dissolved Phosphorus (P)	<0.1	0.1	mg/L			VGG	5081631
Dissolved Potassium (K)	5.3	0.3	mg/L	0.1	0.6	VGG	5081631
Dissolved Selenium (Se)	0.0003	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Silicon (Si)	8.4	0.1	mg/L	1.2		VGG	5081631
Dissolved Silver (Ag)	<0.0001	0.0001	mg/L			TDB	5079506
Dissolved Sodium (Na)	110	0.5	mg/L	4.8	31.2	VGG	5081631
Dissolved Strontium (Sr)	1.1	0.02	mg/L	0.03		VGG	5081631
Dissolved Sulphur (S)	88	0.2	mg/L	5.5		VGG	5081631
Dissolved Thallium (Tl)	<0.0002	0.0002	mg/L			TDB	5079506
Dissolved Tin (Sn)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Titanium (Ti)	0.005	0.001	mg/L	0.000		TDB	5079506
Dissolved Uranium (U)	0.0054	0.0001	mg/L	0.0000		TDB	5079506
Dissolved Vanadium (V)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Zinc (Zn)	0.005	0.003	mg/L	0.000		TDB	5079506
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	1.0	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	101	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Total Trihalomethanes	<2	2	ug/L				5069360
Bromodichloromethane	<0.5	0.5	ug/L			VM	5069952
Bromoform	<0.5	0.5	ug/L			VM	5069952
Bromomethane	<2	2	ug/L			VM	5069952
Carbon tetrachloride	<0.5	0.5	ug/L			VM	5069952
Chlorobenzene	<0.5	0.5	ug/L			VM	5069952
Chlorodibromomethane	<1	1	ug/L			VM	5069952
Chloroethane	<1	1	ug/L			VM	5069952
Chloroform	<0.5	0.5	ug/L			VM	5069952
Chloromethane	4	2	ug/L			VM	5069952
1,2-dibromoethane	<0.5	0.5	ug/L			VM	5069952
1,2-dichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,3-dichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,4-dichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,1-dichloroethane	<0.5	0.5	ug/L			VM	5069952
1,2-dichloroethane	<0.5	0.5	ug/L			VM	5069952
1,1-dichloroethene	<0.5	0.5	ug/L			VM	5069952
cis-1,2-dichloroethene	<0.5	0.5	ug/L			VM	5069952
trans-1,2-dichloroethene	<0.5	0.5	ug/L			VM	5069952
Dichloromethane	<2	2	ug/L			VM	5069952

Maxxam

Success Through Science®

Maxxam Job #: B171800
Report Date: 2011/08/12

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP PRINCE ALBER

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6527 PA-04							
Sampling Date 2011/08/04							
Matrix WATER							
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
1,2-dichloropropane	<0.5	0.5	ug/L			VM	5069952
cis-1,3-dichloropropene	<0.5	0.5	ug/L			VM	5069952
trans-1,3-dichloropropene	<0.5	0.5	ug/L			VM	5069952
Methyl methacrylate	<0.5	0.5	ug/L			VM	5069952
Methyl-tert-butylether (MTBE)	<0.5	0.5	ug/L			VM	5069952
Styrene	<1 (1)	1	ug/L			VM	5069952
1,1,1,2-tetrachloroethane	<2	2	ug/L			VM	5069952
1,1,2,2-tetrachloroethane	<2	2	ug/L			VM	5069952
Tetrachloroethene	<0.5	0.5	ug/L			VM	5069952
1,2,3-trichlorobenzene	<1	1	ug/L			VM	5069952
1,2,4-trichlorobenzene	<1	1	ug/L			VM	5069952
1,3,5-trichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,1,1-trichloroethane	<0.5	0.5	ug/L			VM	5069952
1,1,2-trichloroethane	<0.5	0.5	ug/L			VM	5069952
Trichloroethene	<0.5	0.5	ug/L			VM	5069952
Trichlorofluoromethane	<0.5	0.5	ug/L			VM	5069952
1,2,4-trimethylbenzene	28	0.5	ug/L			VM	5069952
1,3,5-trimethylbenzene	7.9	0.5	ug/L			VM	5069952
Vinyl chloride	<0.5	0.5	ug/L			VM	5069952
4-BROMOFLUOROBENZENE (sur.)	84	70 - 130	%			VM	5069952
D4-1,2-DICHLOROETHANE (sur.)	112	70 - 130	%			VM	5069952
D8-TOLUENE (sur.)	97	70 - 130	%			VM	5069952
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	0.6	0.4	ug/L			RSA	5069858
Dup. Benzene	0.5	0.4	ug/L			RSA	5069858
Toluene	4.8	0.4	ug/L			RSA	5069858
Dup. Toluene	4.4	0.4	ug/L			RSA	5069858
Ethylbenzene	4.9	0.4	ug/L			RSA	5069858
Dup. Ethylbenzene	4.3	0.4	ug/L			RSA	5069858
o-Xylene	25	0.4	ug/L			RSA	5069858
Dup. o-Xylene	21	0.4	ug/L			RSA	5069858
m & p-Xylene	32	0.8	ug/L			RSA	5069858
Dup. m & p-Xylene	28	0.8	ug/L			RSA	5069858
Xylenes (Total)	57	0.8	ug/L			RSA	5069858
Dup. Xylenes (Total)	49	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	<100	100	ug/L			RSA	5069858
Dup. F1 (C6-C10) - BTEX	290	100	ug/L			RSA	5069858
(C6-C10)	140	100	ug/L			RSA	5069858
Dup. (C6-C10)	350	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	92	70 - 130	%			RSA	5069858
Dup. 1,4-Difluorobenzene (sur.)	94	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	103	70 - 130	%			RSA	5069858
Dup. 4-BROMOFLUOROBENZENE (sur.)	97	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	110	70 - 130	%			RSA	5069858
Dup. D4-1,2-DICHLOROETHANE (sur.)	110	70 - 130	%			RSA	5069858
RESULTS OF CHEMICAL ANALYSES OF WATER							
Misc. Organics							
Oil and grease	3	2	mg/L			RC8	5077082

(1) Qualifying ion outside of acceptance criteria. Results are potentially biased high due to possible interferent.

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6527 PA-04							
Sampling Date 2011/08/04							
Matrix WATER							
GLYCOLS BY GC-FID (WATER)							
Glycols							
Ethylene Glycol	<10	10	mg/L			WP0	5073309
Diethylene Glycol	<5	5	mg/L			WP0	5073309
Triethylene Glycol	<10	10	mg/L			WP0	5073309
Tetraethylene Glycol	<10	10	mg/L			WP0	5073309
Propylene Glycol	<10	10	mg/L			WP0	5073309
Methyl Sulfone (sur.)	99	70 - 130	%			WP0	5073309
BE6541 PA-06							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	99	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L			RSA	5069858
Toluene	<0.4	0.4	ug/L			RSA	5069858
Ethylbenzene	<0.4	0.4	ug/L			RSA	5069858
o-Xylene	<0.4	0.4	ug/L			RSA	5069858
m & p-Xylene	<0.8	0.8	ug/L			RSA	5069858
Xylenes (Total)	<0.8	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	<100	100	ug/L			RSA	5069858
(C6-C10)	<100	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	80	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	109	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	129	70 - 130	%			RSA	5069858
BE6542 PA-07							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	13	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	0.3	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	84	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	56	0.4	ug/L			RSA	5069858
Toluene	160	0.4	ug/L			RSA	5069858
Ethylbenzene	140	0.4	ug/L			RSA	5069858
o-Xylene	480	0.4	ug/L			RSA	5069858
m & p-Xylene	680	0.8	ug/L			RSA	5069858
Xylenes (Total)	1200	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	1500	100	ug/L			RSA	5069858
(C6-C10)	3000	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	98	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	111	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	106	70 - 130	%			RSA	5069858

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6543 PA-09							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	0.1	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	100	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	0.6	0.4	ug/L			RSA	5069858
Toluene	5.5	0.4	ug/L			RSA	5069858
Ethylbenzene	9.5	0.4	ug/L			RSA	5069858
o-Xylene	60	0.4	ug/L			RSA	5069858
m & p-Xylene	35	0.8	ug/L			RSA	5069858
Xylenes (Total)	95	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	210	100	ug/L			RSA	5069858
(C6-C10)	320	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	92	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	126	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	104	70 - 130	%			RSA	5069858
BE6545 PA-10							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	99	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L			RSA	5069858
Toluene	<0.4	0.4	ug/L			RSA	5069858
Ethylbenzene	<0.4	0.4	ug/L			RSA	5069858
o-Xylene	0.5	0.4	ug/L			RSA	5069858
m & p-Xylene	<0.8	0.8	ug/L			RSA	5069858
Xylenes (Total)	<0.8	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	<100	100	ug/L			RSA	5069858
(C6-C10)	<100	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	95	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	95	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	103	70 - 130	%			RSA	5069858
BE6546 PA-11							
Sampling Date 2011/08/04							
Matrix WATER							
RESULTS OF CHEMICAL ANALYSES OF WATER							
Low Level Elements							
Dissolved Cadmium (Cd)	0.013	0.005	ug/L	0.000			5069072
ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)							
Elements							
Dissolved Aluminum (Al)	0.043	0.001	mg/L	0.005		TDB	5079506
Dissolved Antimony (Sb)	<0.0006	0.0006	mg/L			TDB	5079506
Dissolved Arsenic (As)	<0.0002	0.0002	mg/L			TDB	5079506

Maxxam Job #: B171800
Report Date: 2011/08/12

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP PRINCE ALBER

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6546 PA-11							
Sampling Date 2011/08/04							
Matrix WATER							
ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)							
Elements							
Dissolved Barium (Ba)	0.31	0.01	mg/L	0.01		VGG	5081631
Dissolved Beryllium (Be)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Boron (B)	0.03	0.02	mg/L	0.01		VGG	5081631
Dissolved Calcium (Ca)	71	0.3	mg/L	3.5	52.2	VGG	5081631
Dissolved Chromium (Cr)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Cobalt (Co)	0.0005	0.0003	mg/L	0.0000		TDB	5079506
Dissolved Copper (Cu)	0.0010	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Iron (Fe)	<0.06	0.06	mg/L			VGG	5081631
Dissolved Lead (Pb)	0.0004	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Lithium (Li)	0.03	0.02	mg/L	0.00		VGG	5081631
Dissolved Magnesium (Mg)	37	0.2	mg/L	3.0	44.8	VGG	5081631
Dissolved Manganese (Mn)	0.10	0.004	mg/L	0.004		VGG	5081631
Dissolved Molybdenum (Mo)	0.0030	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Nickel (Ni)	0.0020	0.0005	mg/L	0.0000		TDB	5079506
Dissolved Phosphorus (P)	<0.1	0.1	mg/L			VGG	5081631
Dissolved Potassium (K)	1.8	0.3	mg/L	0.0		VGG	5081631
Dissolved Selenium (Se)	0.0007	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Silicon (Si)	7.9	0.1	mg/L	1.1		VGG	5081631
Dissolved Silver (Ag)	<0.0001	0.0001	mg/L			TDB	5079506
Dissolved Sodium (Na)	5.7	0.5	mg/L	0.2	3.0	VGG	5081631
Dissolved Strontium (Sr)	0.58	0.02	mg/L	0.01		VGG	5081631
Dissolved Sulphur (S)	3.6	0.2	mg/L	0.2		VGG	5081631
Dissolved Thallium (Tl)	<0.0002	0.0002	mg/L			TDB	5079506
Dissolved Tin (Sn)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Titanium (Ti)	0.002	0.001	mg/L	0.000		TDB	5079506
Dissolved Uranium (U)	0.0012	0.0001	mg/L	0.0000		TDB	5079506
Dissolved Vanadium (V)	<0.001	0.001	mg/L			TDB	5079506
Dissolved Zinc (Zn)	<0.003	0.003	mg/L			TDB	5079506
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	101	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Total Trihalomethanes	<2	2	ug/L				5069360
Bromodichloromethane	<0.5	0.5	ug/L			VM	5069952
Bromoform	<0.5	0.5	ug/L			VM	5069952
Bromomethane	<2	2	ug/L			VM	5069952
Carbon tetrachloride	<0.5	0.5	ug/L			VM	5069952
Chlorobenzene	<0.5	0.5	ug/L			VM	5069952
Chlorodibromomethane	<1	1	ug/L			VM	5069952
Chloroethane	<1	1	ug/L			VM	5069952
Chloroform	<0.5	0.5	ug/L			VM	5069952
Chloromethane	<2	2	ug/L			VM	5069952
1,2-dibromoethane	<0.5	0.5	ug/L			VM	5069952
1,2-dichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,3-dichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,4-dichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,1-dichloroethane	<0.5	0.5	ug/L			VM	5069952
1,2-dichloroethane	<0.5	0.5	ug/L			VM	5069952
1,1-dichloroethene	<0.5	0.5	ug/L			VM	5069952
cis-1,2-dichloroethene	<0.5	0.5	ug/L			VM	5069952
trans-1,2-dichloroethene	<0.5	0.5	ug/L			VM	5069952

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6546 PA-11							
Sampling Date 2011/08/04							
Matrix WATER							
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Dichloromethane	<2	2	ug/L			VM	5069952
1,2-dichloropropane	<0.5	0.5	ug/L			VM	5069952
cis-1,3-dichloropropene	<0.5	0.5	ug/L			VM	5069952
trans-1,3-dichloropropene	<0.5	0.5	ug/L			VM	5069952
Methyl methacrylate	<0.5	0.5	ug/L			VM	5069952
Methyl-tert-butylether (MTBE)	<0.5	0.5	ug/L			VM	5069952
Styrene	<0.5	0.5	ug/L			VM	5069952
1,1,1,2-tetrachloroethane	<2	2	ug/L			VM	5069952
1,1,2,2-tetrachloroethane	<2	2	ug/L			VM	5069952
Tetrachloroethene	<0.5	0.5	ug/L			VM	5069952
1,2,3-trichlorobenzene	<1	1	ug/L			VM	5069952
1,2,4-trichlorobenzene	<1	1	ug/L			VM	5069952
1,3,5-trichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,1,1-trichloroethane	<0.5	0.5	ug/L			VM	5069952
1,1,2-trichloroethane	<0.5	0.5	ug/L			VM	5069952
Trichloroethene	<0.5	0.5	ug/L			VM	5069952
Trichlorofluoromethane	<0.5	0.5	ug/L			VM	5069952
1,2,4-trimethylbenzene	<0.5	0.5	ug/L			VM	5069952
1,3,5-trimethylbenzene	<0.5	0.5	ug/L			VM	5069952
Vinyl chloride	<0.5	0.5	ug/L			VM	5069952
4-BROMOFLUOROBENZENE (sur.)	80	70 - 130	%			VM	5069952
D4-1,2-DICHLOROETHANE (sur.)	113	70 - 130	%			VM	5069952
D8-TOLUENE (sur.)	98	70 - 130	%			VM	5069952
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L			RSA	5069858
Toluene	<0.4	0.4	ug/L			RSA	5069858
Ethylbenzene	<0.4	0.4	ug/L			RSA	5069858
o-Xylene	<0.4	0.4	ug/L			RSA	5069858
m & p-Xylene	<0.8	0.8	ug/L			RSA	5069858
Xylenes (Total)	<0.8	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	<100	100	ug/L			RSA	5069858
(C6-C10)	<100	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	92	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	98	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	105	70 - 130	%			RSA	5069858
RESULTS OF CHEMICAL ANALYSES OF WATER							
Misc. Organics							
Oil and grease	<2	2	mg/L			RC8	5077082
GLYCOLS BY GC-FID (WATER)							
Glycols							
Ethylene Glycol	<10	10	mg/L			WP0	5073309
Diethylene Glycol	<5	5	mg/L			WP0	5073309
Triethylene Glycol	<10	10	mg/L			WP0	5073309
Tetraethylene Glycol	<10	10	mg/L			WP0	5073309
Propylene Glycol	<10	10	mg/L			WP0	5073309
Methyl Sulfone (sur.)	98	70 - 130	%			WP0	5073309
BE6552 PA-12							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6552 PA-12							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	100	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L			RSA	5069858
Toluene	<0.4	0.4	ug/L			RSA	5069858
Ethylbenzene	<0.4	0.4	ug/L			RSA	5069858
o-Xylene	<0.4	0.4	ug/L			RSA	5069858
m & p-Xylene	<0.8	0.8	ug/L			RSA	5069858
Xylenes (Total)	<0.8	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	<100	100	ug/L			RSA	5069858
(C6-C10)	<100	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	95	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	98	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	107	70 - 130	%			RSA	5069858
BE6553 PA-13							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	12	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	86	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	96	0.4	ug/L			RSA	5069858
Toluene	490	0.4	ug/L			RSA	5069858
Ethylbenzene	200	0.4	ug/L			RSA	5069858
o-Xylene	780	0.4	ug/L			RSA	5069858
m & p-Xylene	1100	0.8	ug/L			RSA	5069858
Xylenes (Total)	1900	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	1000	100	ug/L			RSA	5069858
(C6-C10)	3800	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	94	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	103	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	104	70 - 130	%			RSA	5069858
BE6554 PA-14							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	100	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L			RSA	5069858

Sample Details/Parameters		Result	RDL	Units	meq/L	meq %	By	Batch
BE6554	PA-14							
Sampling Date	2011/08/04							
Matrix	WATER							
VOLATILE ORGANICS BY GC-MS (WATER)								
Volatiles								
Toluene		<0.4	0.4	ug/L			RSA	5069858
Ethylbenzene		<0.4	0.4	ug/L			RSA	5069858
o-Xylene		<0.4	0.4	ug/L			RSA	5069858
m & p-Xylene		<0.8	0.8	ug/L			RSA	5069858
Xylenes (Total)		<0.8	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX		<100	100	ug/L			RSA	5069858
(C6-C10)		<100	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)		98	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)		105	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)		99	70 - 130	%			RSA	5069858
BE6555	BDW1							
Sampling Date	2011/08/04							
Matrix	WATER							
RESULTS OF CHEMICAL ANALYSES OF WATER								
Low Level Elements								
Dissolved Cadmium (Cd)		0.048	0.005	ug/L	0.000			5069072
ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)								
Elements								
Dissolved Aluminum (Al)		0.075	0.001	mg/L	0.008		TDB	5079506
Dissolved Antimony (Sb)		<0.0006	0.0006	mg/L			TDB	5079506
Dissolved Arsenic (As)		0.0045	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Barium (Ba)		0.04	0.01	mg/L	0.00		VGG	5081631
Dissolved Beryllium (Be)		<0.001	0.001	mg/L			TDB	5079506
Dissolved Boron (B)		0.39	0.02	mg/L	0.11		VGG	5081631
Dissolved Calcium (Ca)		140	0.3	mg/L	7.0	47.0	VGG	5081631
Dissolved Chromium (Cr)		<0.001	0.001	mg/L			TDB	5079506
Dissolved Cobalt (Co)		0.0020	0.0003	mg/L	0.0000		TDB	5079506
Dissolved Copper (Cu)		0.0008	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Iron (Fe)		<0.06	0.06	mg/L			VGG	5081631
Dissolved Lead (Pb)		0.0005	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Lithium (Li)		0.16	0.02	mg/L	0.02		VGG	5081631
Dissolved Magnesium (Mg)		36	0.2	mg/L	3.0	20.1	VGG	5081631
Dissolved Manganese (Mn)		0.55	0.004	mg/L	0.020		VGG	5081631
Dissolved Molybdenum (Mo)		0.010	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Nickel (Ni)		0.0062	0.0005	mg/L	0.0000		TDB	5079506
Dissolved Phosphorus (P)		<0.1	0.1	mg/L			VGG	5081631
Dissolved Potassium (K)		5.2	0.3	mg/L	0.1	0.7	VGG	5081631
Dissolved Selenium (Se)		0.0003	0.0002	mg/L	0.0000		TDB	5079506
Dissolved Silicon (Si)		8.2	0.1	mg/L	1.1		VGG	5081631
Dissolved Silver (Ag)		<0.0001	0.0001	mg/L			TDB	5079506
Dissolved Sodium (Na)		110	0.5	mg/L	4.8	32.2	VGG	5081631
Dissolved Strontium (Sr)		1.0	0.02	mg/L	0.02		VGG	5081631
Dissolved Sulphur (S)		86	0.2	mg/L	5.4		VGG	5081631
Dissolved Thallium (Tl)		<0.0002	0.0002	mg/L			TDB	5079506
Dissolved Tin (Sn)		<0.001	0.001	mg/L			TDB	5079506
Dissolved Titanium (Ti)		0.005	0.001	mg/L	0.000		TDB	5079506
Dissolved Uranium (U)		0.0053	0.0001	mg/L	0.0000		TDB	5079506
Dissolved Vanadium (V)		<0.001	0.001	mg/L			TDB	5079506
Dissolved Zinc (Zn)		0.005	0.003	mg/L	0.000		TDB	5079506
PETROLEUM HYDROCARBONS (CCME)								
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)		0.9	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)		<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)		<0.1	0.1	mg/L			LQ	5072881

Maxxam

Maxxam Job #: B171800
Report Date: 2011/08/12

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP PRINCE ALBER

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6555 BDW1							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	101	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Total Trihalomethanes	<2	2	ug/L				5069360
Bromodichloromethane	<0.5	0.5	ug/L			VM	5069952
Bromoform	<0.5	0.5	ug/L			VM	5069952
Bromomethane	<2	2	ug/L			VM	5069952
Carbon tetrachloride	<0.5	0.5	ug/L			VM	5069952
Chlorobenzene	<0.5	0.5	ug/L			VM	5069952
Chlorodibromomethane	<1	1	ug/L			VM	5069952
Chloroethane	<1	1	ug/L			VM	5069952
Chloroform	<0.5	0.5	ug/L			VM	5069952
Chloromethane	5	2	ug/L			VM	5069952
1,2-dibromoethane	<0.5	0.5	ug/L			VM	5069952
1,2-dichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,3-dichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,4-dichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,1-dichloroethane	<0.5	0.5	ug/L			VM	5069952
1,2-dichloroethane	<0.5	0.5	ug/L			VM	5069952
1,1-dichloroethene	<0.5	0.5	ug/L			VM	5069952
cis-1,2-dichloroethene	<0.5	0.5	ug/L			VM	5069952
trans-1,2-dichloroethene	<0.5	0.5	ug/L			VM	5069952
Dichloromethane	<2	2	ug/L			VM	5069952
1,2-dichloropropane	<0.5	0.5	ug/L			VM	5069952
cis-1,3-dichloropropene	<0.5	0.5	ug/L			VM	5069952
trans-1,3-dichloropropene	<0.5	0.5	ug/L			VM	5069952
Methyl methacrylate	<0.5	0.5	ug/L			VM	5069952
Methyl-tert-butylether (MTBE)	<0.5	0.5	ug/L			VM	5069952
Styrene	<1 (1)	1	ug/L			VM	5069952
1,1,1,2-tetrachloroethane	<2	2	ug/L			VM	5069952
1,1,2,2-tetrachloroethane	<2	2	ug/L			VM	5069952
Tetrachloroethene	<0.5	0.5	ug/L			VM	5069952
1,2,3-trichlorobenzene	<1	1	ug/L			VM	5069952
1,2,4-trichlorobenzene	<1	1	ug/L			VM	5069952
1,3,5-trichlorobenzene	<0.5	0.5	ug/L			VM	5069952
1,1,1-trichloroethane	<0.5	0.5	ug/L			VM	5069952
1,1,2-trichloroethane	<0.5	0.5	ug/L			VM	5069952
Trichloroethene	<0.5	0.5	ug/L			VM	5069952
Trichlorofluoromethane	<0.5	0.5	ug/L			VM	5069952
1,2,4-trimethylbenzene	20	0.5	ug/L			VM	5069952
1,3,5-trimethylbenzene	6.3	0.5	ug/L			VM	5069952
Vinyl chloride	<0.5	0.5	ug/L			VM	5069952
4-BROMOFLUOROBENZENE (sur.)	84	70 - 130	%			VM	5069952
D4-1,2-DICHLOROETHANE (sur.)	116	70 - 130	%			VM	5069952
D8-TOLUENE (sur.)	97	70 - 130	%			VM	5069952
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	0.7	0.4	ug/L			RSA	5069858
Toluene	4.6	0.4	ug/L			RSA	5069858

(1) Qualifying ion outside of acceptance criteria. Results are potentially biased high due to possible interferent.

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6555 BDW1							
Sampling Date 2011/08/04							
Matrix WATER							
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Ethylbenzene	3.7	0.4	ug/L			RSA	5069858
o-Xylene	19	0.4	ug/L			RSA	5069858
m & p-Xylene	23	0.8	ug/L			RSA	5069858
Xylenes (Total)	43	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	<100	100	ug/L			RSA	5069858
(C6-C10)	<100	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	95	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	105	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	108	70 - 130	%			RSA	5069858
RESULTS OF CHEMICAL ANALYSES OF WATER							
Misc. Organics							
Oil and grease	5	2	mg/L			RC8	5077082
GLYCOLS BY GC-FID (WATER)							
Glycols							
Ethylene Glycol	<10	10	mg/L			WP0	5073309
Diethylene Glycol	<5	5	mg/L			WP0	5073309
Triethylene Glycol	<10	10	mg/L			WP0	5073309
Tetraethylene Glycol	<10	10	mg/L			WP0	5073309
Propylene Glycol	<10	10	mg/L			WP0	5073309
Methyl Sulfone (sur.)	99	70 - 130	%			WP0	5073309
BE6556 PA-17							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	101	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L			RSA	5069858
Toluene	<0.4	0.4	ug/L			RSA	5069858
Ethylbenzene	<0.4	0.4	ug/L			RSA	5069858
o-Xylene	<0.4	0.4	ug/L			RSA	5069858
m & p-Xylene	<0.8	0.8	ug/L			RSA	5069858
Xylenes (Total)	<0.8	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	<100	100	ug/L			RSA	5069858
(C6-C10)	<100	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	91	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	101	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	112	70 - 130	%			RSA	5069858
BE6557 MW-1							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	0.9	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6557 MW-1							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
O-TERPHENYL (sur.)	93	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L			RSA	5069858
Toluene	1.1	0.4	ug/L			RSA	5069858
Ethylbenzene	<0.4	0.4	ug/L			RSA	5069858
o-Xylene	47	0.4	ug/L			RSA	5069858
m & p-Xylene	2.6	0.8	ug/L			RSA	5069858
Xylenes (Total)	49	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	<100	100	ug/L			RSA	5069858
(C6-C10)	<100	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	93	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	104	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	116	70 - 130	%			RSA	5069858
BE6558 MW-4							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	94	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L			RSA	5069858
Toluene	<0.4	0.4	ug/L			RSA	5069858
Ethylbenzene	<0.4	0.4	ug/L			RSA	5069858
o-Xylene	<0.4	0.4	ug/L			RSA	5069858
m & p-Xylene	<0.8	0.8	ug/L			RSA	5069858
Xylenes (Total)	<0.8	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	<100	100	ug/L			RSA	5069858
(C6-C10)	<100	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	100	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	96	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	102	70 - 130	%			RSA	5069858
BE6559 BDW2							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	14	0.1	mg/L			LQ	5072881
Dup. F2 (C10-C16 Hydrocarbons)	11	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	0.3	0.1	mg/L			LQ	5072881
Dup. F3 (C16-C34 Hydrocarbons)	0.2	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Dup. F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
Dup. Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	85	50 - 130	%			LQ	5072881
Dup. O-TERPHENYL (sur.)	89	50 - 130	%			LQ	5072881

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6559 BDW2							
Sampling Date 2011/08/04							
Matrix WATER							
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	83	0.4	ug/L			RSA	5069858
Toluene	230	0.4	ug/L			RSA	5069858
Ethylbenzene	190	0.4	ug/L			RSA	5069858
o-Xylene	650	0.4	ug/L			RSA	5069858
m & p-Xylene	930	0.8	ug/L			RSA	5069858
Xylenes (Total)	1600	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	1000	100	ug/L			RSA	5069858
(C6-C10)	3100	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	89	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	103	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	111	70 - 130	%			RSA	5069858
BE6560 PA-08-P							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	11000 (1)	10	mg/L			JW0	5080183
F3 (C16-C34 Hydrocarbons)	<10 (2)	10	mg/L			JW0	5080183
F4 (C34-C50 Hydrocarbons)	<10 (2)	10	mg/L			JW0	5080183
Reached Baseline at C50	YES		mg/L			JW0	5080183
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	29000	8000	ug/L			PX	5079260
Toluene	550000	8000	ug/L			PX	5079260
Ethylbenzene	630000	8000	ug/L			PX	5079260
o-Xylene	3300000	8000	ug/L			PX	5079260
m & p-Xylene	5600000	20000	ug/L			PX	5079260
Xylenes (Total)	8900000	20000	ug/L			PX	5079260
F1 (C6-C10) - BTEX	170000000	2000000	ug/L			PX	5079260
(C6-C10)	180000000	2000000	ug/L			PX	5079260
1,4-Difluorobenzene (sur.)	100	70 - 130	%			PX	5079260
4-BROMOFLUOROBENZENE (sur.)	96	70 - 130	%			PX	5079260
D4-1,2-DICHLOROETHANE (sur.)	85	70 - 130	%			PX	5079260

(1) Detection limit raised due to dilution. Result exceeds calibration range.
(2) Detection limits raised due to matrix interference.

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6561 UST-P							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	11000 (1)	10	mg/L			JW0	5080183
F3 (C16-C34 Hydrocarbons)	<10 (2)	10	mg/L			JW0	5080183
F4 (C34-C50 Hydrocarbons)	<10 (2)	10	mg/L			JW0	5080183
Reached Baseline at C50	YES		mg/L			JW0	5080183

(1) Detection limit raised due to dilution. Result exceeds calibration range.
(2) Detection limits raised due to matrix interference.

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6561 UST-P							
Sampling Date 2011/08/04							
Matrix WATER							
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	34000	8000	ug/L			PX	5079260
Toluene	400000	8000	ug/L			PX	5079260
Ethylbenzene	630000	8000	ug/L			PX	5079260
o-Xylene	1300000	8000	ug/L			PX	5079260
m & p-Xylene	2300000	20000	ug/L			PX	5079260
Xylenes (Total)	3600000	20000	ug/L			PX	5079260
F1 (C6-C10) - BTEX	150000000	2000000	ug/L			PX	5079260
(C6-C10)	150000000	2000000	ug/L			PX	5079260
1,4-Difluorobenzene (sur.)	101	70 - 130	%			PX	5079260
4-BROMOFLUOROBENZENE (sur.)	97	70 - 130	%			PX	5079260
D4-1,2-DICHLOROETHANE (sur.)	89	70 - 130	%			PX	5079260
BE6562 MW-2-P							
Sampling Date 2011/08/04							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	11000 (1)	10	mg/L			JW0	5080183
F3 (C16-C34 Hydrocarbons)	16 (2)	10	mg/L			JW0	5080183
F4 (C34-C50 Hydrocarbons)	<10 (2)	10	mg/L			JW0	5080183
Reached Baseline at C50	YES		mg/L			JW0	5080183
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	40000	8000	ug/L			PX	5079260
Toluene	810000	8000	ug/L			PX	5079260
Ethylbenzene	1200000	8000	ug/L			PX	5079260
o-Xylene	4600000	8000	ug/L			PX	5079260
m & p-Xylene	7700000	20000	ug/L			PX	5079260
Xylenes (Total)	12000000	20000	ug/L			PX	5079260
F1 (C6-C10) - BTEX	250000000	2000000	ug/L			PX	5079260
(C6-C10)	260000000	2000000	ug/L			PX	5079260
1,4-Difluorobenzene (sur.)	90	70 - 130	%			PX	5079260
4-BROMOFLUOROBENZENE (sur.)	82	70 - 130	%			PX	5079260
D4-1,2-DICHLOROETHANE (sur.)	97	70 - 130	%			PX	5079260

(1) Detection limit raised due to dilution. Result exceeds calibration range.
(2) Detection limits raised due to matrix interference.

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6563 MWSE-P							
Sampling Date							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	10000 (1)	10	mg/L			JW0	5080183
F3 (C16-C34 Hydrocarbons)	<10 (2)	10	mg/L			JW0	5080183
F4 (C34-C50 Hydrocarbons)	<10 (2)	10	mg/L			JW0	5080183
Reached Baseline at C50	YES		mg/L			JW0	5080183

(1) Detection limit raised due to dilution. Result exceeds calibration range.
(2) Detection limits raised due to matrix interference.

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6563 MWSE-P							
Sampling Date							
Matrix WATER							
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	57000	8000	ug/L			PX	5079260
Toluene	1100000	8000	ug/L			PX	5079260
Ethylbenzene	1100000	8000	ug/L			PX	5079260
o-Xylene	4800000	8000	ug/L			PX	5079260
m & p-Xylene	8500000	20000	ug/L			PX	5079260
Xylenes (Total)	13000000	20000	ug/L			PX	5079260
F1 (C6-C10) - BTEX	270000000	2000000	ug/L			PX	5079260
(C6-C10)	290000000	2000000	ug/L			PX	5079260
1,4-Difluorobenzene (sur.)	84	70 - 130	%			PX	5079260
4-BROMOFLUOROBENZENE (sur.)	124	70 - 130	%			PX	5079260
D4-1,2-DICHLOROETHANE (sur.)	102	70 - 130	%			PX	5079260
BE6737 PA-FB							
Sampling Date							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			LQ	5072881
Reached Baseline at C50	YES		mg/L			LQ	5072881
O-TERPHENYL (sur.)	93	50 - 130	%			LQ	5072881
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L			RSA	5069858
Toluene	1.2	0.4	ug/L			RSA	5069858
Ethylbenzene	<0.4	0.4	ug/L			RSA	5069858
o-Xylene	<0.4	0.4	ug/L			RSA	5069858
m & p-Xylene	<0.8	0.8	ug/L			RSA	5069858
Xylenes (Total)	<0.8	0.8	ug/L			RSA	5069858
F1 (C6-C10) - BTEX	<100	100	ug/L			RSA	5069858
(C6-C10)	<100	100	ug/L			RSA	5069858
1,4-Difluorobenzene (sur.)	88	70 - 130	%			RSA	5069858
4-BROMOFLUOROBENZENE (sur.)	104	70 - 130	%			RSA	5069858
D4-1,2-DICHLOROETHANE (sur.)	112	70 - 130	%			RSA	5069858

Package 1	8.0°C
Package 2	10.7°C
Package 3	8.7°C
Package 4	7.7°C

Each temperature is the average of up to three cooler temperatures taken at receipt

VOLATILE ORGANICS BY GC-MS (WATER) Comments

Sample BE6527-02 VOCs in Water by P&T GC/MS (Std List): Sample was run by GC/MS/Headspace as per CAL SOP-00227.

Sample BE6546-02 VOCs in Water by P&T GC/MS (Std List): Sample was run by GC/MS/Headspace as per CAL SOP-00227.

Sample BE6555-02 VOCs in Water by P&T GC/MS (Std List): Sample was run by GC/MS/Headspace as per CAL SOP-00227.

VOLATILE ORGANICS BY GC-MS (WATER) Comments

Sample BE6560-01 BTEX/F1 in Water by HS GC/MS: Detection limits raised due to dilution to bring analyte within the calibrated range.

Sample BE6561-01 BTEX/F1 in Water by HS GC/MS: Detection limits raised due to dilution to bring analyte within the calibrated range.

Sample BE6562-01 BTEX/F1 in Water by HS GC/MS: Detection limits raised due to dilution to bring analyte within the calibrated range.

Sample BE6563-01 BTEX/F1 in Water by HS GC/MS: Detection limits raised due to dilution to bring analyte within the calibrated range.

Meq % is based on dissolved calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulphate and chloride

Results relate only to the items tested.

Maxxam

Success Through Science®

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP PRINCE ALBER
P.O. #:
Site Location:

Quality Assurance Report

Maxxam Job Number: CB171800

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5069858 RSA	Matrix Spike						
	[BE6541-01]	1,4-Difluorobenzene (sur.)	2011/08/11		102	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/08/11		110	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/11		106	%	70 - 130
		Benzene	2011/08/11		121	%	70 - 130
		Toluene	2011/08/11		112	%	70 - 130
		Ethylbenzene	2011/08/11		122	%	70 - 130
		o-Xylene	2011/08/11		125	%	70 - 130
		m & p-Xylene	2011/08/11		129	%	70 - 130
	Spiked Blank	1,4-Difluorobenzene (sur.)	2011/08/09		90	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/08/09		94	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/09		111	%	70 - 130
		Benzene	2011/08/09		108	%	70 - 130
		Toluene	2011/08/09		110	%	70 - 130
		Ethylbenzene	2011/08/09		108	%	70 - 130
		o-Xylene	2011/08/09		119	%	70 - 130
		m & p-Xylene	2011/08/09		112	%	70 - 130
		(C6-C10)	2011/08/09		112	%	70 - 130
	Method Blank	1,4-Difluorobenzene (sur.)	2011/08/11		101	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/08/11		110	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/11		116	%	70 - 130
		Benzene	2011/08/11	<0.4		ug/L	
		Toluene	2011/08/11	<0.4		ug/L	
		Ethylbenzene	2011/08/11	<0.4		ug/L	
		o-Xylene	2011/08/11	<0.4		ug/L	
		m & p-Xylene	2011/08/11	<0.8		ug/L	
		Xylenes (Total)	2011/08/11	<0.8		ug/L	
		F1 (C6-C10) - BTEX	2011/08/11	<100		ug/L	
		(C6-C10)	2011/08/11	<100		ug/L	
	RPD [BE6527-02]	Benzene	2011/08/09	NC		%	40
		Toluene	2011/08/09	9.1		%	40
		Ethylbenzene	2011/08/09	11.3		%	40
		o-Xylene	2011/08/09	16.1		%	40
		m & p-Xylene	2011/08/09	14.4		%	40
		Xylenes (Total)	2011/08/09	15.2		%	40
		F1 (C6-C10) - BTEX	2011/08/09	NC		%	40
		(C6-C10)	2011/08/09	NC		%	40
5069952 VM	Matrix Spike	4-BROMOFLUOROBENZENE (sur.)	2011/08/08		94	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/08		111	%	70 - 130
		D8-TOLUENE (sur.)	2011/08/08		97	%	70 - 130
		Bromodichloromethane	2011/08/08		109	%	70 - 130
		Bromoform	2011/08/08		105	%	70 - 130
		Bromomethane	2011/08/08		104	%	70 - 130
		Carbon tetrachloride	2011/08/08		118	%	70 - 130
		Chlorobenzene	2011/08/08		83	%	70 - 130
		Chlorodibromomethane	2011/08/08		110	%	70 - 130
		Chloroethane	2011/08/08		104	%	70 - 130
		Chloroform	2011/08/08		113	%	70 - 130
		Chloromethane	2011/08/08		86	%	70 - 130
		1,2-dibromoethane	2011/08/08		97	%	70 - 130
		1,2-dichlorobenzene	2011/08/08		95	%	70 - 130
		1,3-dichlorobenzene	2011/08/08		103	%	70 - 130
		1,4-dichlorobenzene	2011/08/08		100	%	70 - 130
		1,1-dichloroethane	2011/08/08		112	%	70 - 130
		1,2-dichloroethane	2011/08/08		107	%	70 - 130

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EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP PRINCE ALBER
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: CB171800

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5069952 VM	Matrix Spike	1,1-dichloroethene	2011/08/08		107	%	70 - 130
		cis-1,2-dichloroethene	2011/08/08		98	%	70 - 130
		trans-1,2-dichloroethene	2011/08/08		110	%	70 - 130
		Dichloromethane	2011/08/08		104	%	70 - 130
		1,2-dichloropropane	2011/08/08		103	%	70 - 130
		cis-1,3-dichloropropene	2011/08/08		99	%	70 - 130
		trans-1,3-dichloropropene	2011/08/08		89	%	70 - 130
		Methyl methacrylate	2011/08/08		82	%	70 - 130
		Methyl-tert-butylether (MTBE)	2011/08/08		99	%	70 - 130
		Styrene	2011/08/08		96	%	70 - 130
		1,1,1,2-tetrachloroethane	2011/08/08		110	%	70 - 130
		1,1,2,2-tetrachloroethane	2011/08/08		108	%	70 - 130
		Tetrachloroethene	2011/08/08		109	%	70 - 130
		1,2,3-trichlorobenzene	2011/08/08		77	%	70 - 130
		1,2,4-trichlorobenzene	2011/08/08		78	%	70 - 130
		1,3,5-trichlorobenzene	2011/08/08		81	%	70 - 130
		1,1,1-trichloroethane	2011/08/08		113	%	70 - 130
		1,1,2-trichloroethane	2011/08/08		106	%	70 - 130
		Trichloroethene	2011/08/08		109	%	70 - 130
		Trichlorofluoromethane	2011/08/08		116	%	70 - 130
		1,2,4-trimethylbenzene	2011/08/08		91	%	70 - 130
		1,3,5-trimethylbenzene	2011/08/08		88	%	70 - 130
		Vinyl chloride	2011/08/08		107	%	70 - 130
	Spiked Blank	4-BROMOFLUOROBENZENE (sur.)	2011/08/08		92	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/08		109	%	70 - 130
		D8-TOLUENE (sur.)	2011/08/08		93	%	70 - 130
		Bromodichloromethane	2011/08/08		113	%	70 - 130
		Bromoform	2011/08/08		111	%	70 - 130
		Bromomethane	2011/08/08		126	%	70 - 130
		Carbon tetrachloride	2011/08/08		114	%	70 - 130
		Chlorobenzene	2011/08/08		87	%	70 - 130
		Chlorodibromomethane	2011/08/08		110	%	70 - 130
		Chloroethane	2011/08/08		129	%	70 - 130
		Chloroform	2011/08/08		113	%	70 - 130
		Chloromethane	2011/08/08		78	%	70 - 130
		1,2-dibromoethane	2011/08/08		101	%	70 - 130
		1,2-dichlorobenzene	2011/08/08		98	%	70 - 130
		1,3-dichlorobenzene	2011/08/08		107	%	70 - 130
		1,4-dichlorobenzene	2011/08/08		101	%	70 - 130
		1,1-dichloroethane	2011/08/08		108	%	70 - 130
		1,2-dichloroethane	2011/08/08		113	%	70 - 130
		1,1-dichloroethene	2011/08/08		113	%	70 - 130
		cis-1,2-dichloroethene	2011/08/08		105	%	70 - 130
		trans-1,2-dichloroethene	2011/08/08		116	%	70 - 130
		Dichloromethane	2011/08/08		106	%	70 - 130
		1,2-dichloropropane	2011/08/08		109	%	70 - 130
		cis-1,3-dichloropropene	2011/08/08		105	%	70 - 130
		trans-1,3-dichloropropene	2011/08/08		95	%	70 - 130
		Methyl methacrylate	2011/08/08		87	%	70 - 130
		Methyl-tert-butylether (MTBE)	2011/08/08		104	%	70 - 130
		Styrene	2011/08/08		102	%	70 - 130
		1,1,1,2-tetrachloroethane	2011/08/08		93	%	70 - 130
		1,1,2,2-tetrachloroethane	2011/08/08		120	%	70 - 130
		Tetrachloroethene	2011/08/08		109	%	70 - 130
		1,2,3-trichlorobenzene	2011/08/08		88	%	70 - 130

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP PRINCE ALBER
P.O. #:
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Quality Assurance Report (Continued)

Maxxam Job Number: CB171800

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5069952 VM	Spiked Blank	1,2,4-trichlorobenzene	2011/08/08		86	%	70 - 130
		1,3,5-trichlorobenzene	2011/08/08		86	%	70 - 130
		1,1,1-trichloroethane	2011/08/08		118	%	70 - 130
		1,1,2-trichloroethane	2011/08/08		112	%	70 - 130
		Trichloroethene	2011/08/08		112	%	70 - 130
		Trichlorofluoromethane	2011/08/08		129	%	70 - 130
		1,2,4-trimethylbenzene	2011/08/08		96	%	70 - 130
		1,3,5-trimethylbenzene	2011/08/08		98	%	70 - 130
		Vinyl chloride	2011/08/08		129	%	70 - 130
	Method Blank	4-BROMOFLUOROBENZENE (sur.)	2011/08/08		79	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/08		112	%	70 - 130
		D8-TOLUENE (sur.)	2011/08/08		98	%	70 - 130
		Bromodichloromethane	2011/08/08	<0.5		ug/L	
		Bromoform	2011/08/08	<0.5		ug/L	
		Bromomethane	2011/08/08	<2		ug/L	
		Carbon tetrachloride	2011/08/08	<0.5		ug/L	
		Chlorobenzene	2011/08/08	<0.5		ug/L	
		Chlorodibromomethane	2011/08/08	<1		ug/L	
		Chloroethane	2011/08/08	<1		ug/L	
		Chloroform	2011/08/08	<0.5		ug/L	
		Chloromethane	2011/08/08	<2		ug/L	
		1,2-dibromoethane	2011/08/08	<0.5		ug/L	
		1,2-dichlorobenzene	2011/08/08	<0.5		ug/L	
		1,3-dichlorobenzene	2011/08/08	<0.5		ug/L	
		1,4-dichlorobenzene	2011/08/08	<0.5		ug/L	
		1,1-dichloroethane	2011/08/08	<0.5		ug/L	
		1,2-dichloroethane	2011/08/08	<0.5		ug/L	
		1,1-dichloroethene	2011/08/08	<0.5		ug/L	
		cis-1,2-dichloroethene	2011/08/08	<0.5		ug/L	
		trans-1,2-dichloroethene	2011/08/08	<0.5		ug/L	
		Dichloromethane	2011/08/08	<2		ug/L	
		1,2-dichloropropane	2011/08/08	<0.5		ug/L	
		cis-1,3-dichloropropene	2011/08/08	<0.5		ug/L	
		trans-1,3-dichloropropene	2011/08/08	<0.5		ug/L	
		Methyl methacrylate	2011/08/08	<0.5		ug/L	
		Methyl-tert-butylether (MTBE)	2011/08/08	<0.5		ug/L	
		Styrene	2011/08/08	<0.5		ug/L	
		1,1,1,2-tetrachloroethane	2011/08/08	<2		ug/L	
		1,1,2,2-tetrachloroethane	2011/08/08	<2		ug/L	
		Tetrachloroethene	2011/08/08	<0.5		ug/L	
		1,2,3-trichlorobenzene	2011/08/08	<1		ug/L	
		1,2,4-trichlorobenzene	2011/08/08	<1		ug/L	
		1,3,5-trichlorobenzene	2011/08/08	<0.5		ug/L	
		1,1,1-trichloroethane	2011/08/08	<0.5		ug/L	
		1,1,2-trichloroethane	2011/08/08	<0.5		ug/L	
		Trichloroethene	2011/08/08	<0.5		ug/L	
		Trichlorofluoromethane	2011/08/08	<0.5		ug/L	
		1,2,4-trimethylbenzene	2011/08/08	<0.5		ug/L	
		1,3,5-trimethylbenzene	2011/08/08	<0.5		ug/L	
		Vinyl chloride	2011/08/08	<0.5		ug/L	
	RPD	Bromodichloromethane	2011/08/08	NC		%	40
		Bromoform	2011/08/08	NC		%	40
		Bromomethane	2011/08/08	NC		%	40
		Carbon tetrachloride	2011/08/08	NC		%	40
		Chlorobenzene	2011/08/08	NC		%	40

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP PRINCE ALBER
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Quality Assurance Report (Continued)

Maxxam Job Number: CB171800

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5069952 VM	RPD	Chlorodibromomethane	2011/08/08	NC		%	40
		Chloroethane	2011/08/08	NC		%	40
		Chloroform	2011/08/08	NC		%	40
		Chloromethane	2011/08/08	NC		%	40
		1,2-dibromoethane	2011/08/08	NC		%	40
		1,2-dichlorobenzene	2011/08/08	NC		%	40
		1,3-dichlorobenzene	2011/08/08	NC		%	40
		1,4-dichlorobenzene	2011/08/08	NC		%	40
		1,1-dichloroethane	2011/08/08	NC		%	40
		1,2-dichloroethane	2011/08/08	NC		%	40
		1,1-dichloroethene	2011/08/08	NC		%	40
		cis-1,2-dichloroethene	2011/08/08	NC		%	40
		trans-1,2-dichloroethene	2011/08/08	NC		%	40
		Dichloromethane	2011/08/08	NC		%	40
		1,2-dichloropropane	2011/08/08	NC		%	40
		cis-1,3-dichloropropene	2011/08/08	NC		%	40
		trans-1,3-dichloropropene	2011/08/08	NC		%	40
		Methyl methacrylate	2011/08/08	NC		%	40
		Methyl-tert-butylether (MTBE)	2011/08/08	NC		%	40
		Styrene	2011/08/08	NC		%	40
		1,1,1,2-tetrachloroethane	2011/08/08	NC		%	40
		1,1,2,2-tetrachloroethane	2011/08/08	NC		%	40
		Tetrachloroethene	2011/08/08	NC		%	40
		1,2,3-trichlorobenzene	2011/08/08	NC		%	40
		1,2,4-trichlorobenzene	2011/08/08	NC		%	40
		1,3,5-trichlorobenzene	2011/08/08	NC		%	40
		1,1,1-trichloroethane	2011/08/08	NC		%	40
		1,1,2-trichloroethane	2011/08/08	NC		%	40
		Trichloroethene	2011/08/08	NC		%	40
		Trichlorofluoromethane	2011/08/08	NC		%	40
		1,2,4-trimethylbenzene	2011/08/08	NC		%	40
		1,3,5-trimethylbenzene	2011/08/08	NC		%	40
		Vinyl chloride	2011/08/08	NC		%	40
5072881 LQ	Matrix Spike						
	[BE6553-01]	O-TERPHENYL (sur.)	2011/08/09		84	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/09		59	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2011/08/09		74	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2011/08/09		84	%	50 - 130
	Spiked Blank	O-TERPHENYL (sur.)	2011/08/09		97	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/09		99	%	70 - 130
		F3 (C16-C34 Hydrocarbons)	2011/08/09		95	%	70 - 130
		F4 (C34-C50 Hydrocarbons)	2011/08/09		87	%	70 - 130
	Method Blank	O-TERPHENYL (sur.)	2011/08/09		99	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/09	<0.1		mg/L	
		F3 (C16-C34 Hydrocarbons)	2011/08/09	<0.1		mg/L	
		F4 (C34-C50 Hydrocarbons)	2011/08/09	<0.1		mg/L	
	RPD [BE6559-01]	F2 (C10-C16 Hydrocarbons)	2011/08/09	26.8		%	40
		F3 (C16-C34 Hydrocarbons)	2011/08/09	NC		%	40
		F4 (C34-C50 Hydrocarbons)	2011/08/09	NC		%	40
5073309 WP0	Matrix Spike	Methyl Sulfone (sur.)	2011/08/10		102	%	70 - 130
		Ethylene Glycol	2011/08/10		100	%	70 - 130
		Diethylene Glycol	2011/08/10		102	%	70 - 130
		Triethylene Glycol	2011/08/10		109	%	70 - 130
		Tetraethylene Glycol	2011/08/10		119	%	70 - 130
		Propylene Glycol	2011/08/10		96	%	70 - 130

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
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P.O. #:
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Quality Assurance Report (Continued)

Maxxam Job Number: CB171800

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5073309 WP0	Spiked Blank	Methyl Sulfone (sur.)	2011/08/11		102	%	70 - 130
		Ethylene Glycol	2011/08/11		101	%	70 - 130
		Diethylene Glycol	2011/08/11		101	%	70 - 130
		Triethylene Glycol	2011/08/11		108	%	70 - 130
		Tetraethylene Glycol	2011/08/11		117	%	70 - 130
		Propylene Glycol	2011/08/11		95	%	70 - 130
	Method Blank	Methyl Sulfone (sur.)	2011/08/10		93	%	70 - 130
		Ethylene Glycol	2011/08/10	<10		mg/L	
		Diethylene Glycol	2011/08/10	<5		mg/L	
		Triethylene Glycol	2011/08/10	<10		mg/L	
		Tetraethylene Glycol	2011/08/10	<10		mg/L	
		Propylene Glycol	2011/08/10	<10		mg/L	
	RPD	Ethylene Glycol	2011/08/11	NC		%	40
		Diethylene Glycol	2011/08/11	NC		%	40
		Triethylene Glycol	2011/08/11	NC		%	40
		Tetraethylene Glycol	2011/08/11	NC		%	40
		Propylene Glycol	2011/08/11	NC		%	40
5077082 RC8	Matrix Spike	Oil and grease	2011/08/10		78	%	70 - 130
	Spiked Blank	Oil and grease	2011/08/10		100	%	70 - 130
	Method Blank	Oil and grease	2011/08/10	<2		mg/L	
	RPD	Oil and grease	2011/08/10	3.4		%	40
5079260 PX	Matrix Spike	1,4-Difluorobenzene (sur.)	2011/08/12		97	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/08/12		116	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/12		88	%	70 - 130
		Benzene	2011/08/12		97	%	70 - 130
		Toluene	2011/08/12		103	%	70 - 130
		Ethylbenzene	2011/08/12		108	%	70 - 130
		o-Xylene	2011/08/12		110	%	70 - 130
		m & p-Xylene	2011/08/12		112	%	70 - 130
	Spiked Blank	1,4-Difluorobenzene (sur.)	2011/08/11		95	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/08/11		110	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/11		95	%	70 - 130
		Benzene	2011/08/11		100	%	70 - 130
		Toluene	2011/08/11		103	%	70 - 130
		Ethylbenzene	2011/08/11		106	%	70 - 130
		o-Xylene	2011/08/11		114	%	70 - 130
		m & p-Xylene	2011/08/11		112	%	70 - 130
		(C6-C10)	2011/08/11		97	%	70 - 130
	Method Blank	1,4-Difluorobenzene (sur.)	2011/08/12		112	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/08/12		98	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/12		101	%	70 - 130
		Benzene	2011/08/12	<0.4		ug/L	
		Toluene	2011/08/12	<0.4		ug/L	
		Ethylbenzene	2011/08/12	<0.4		ug/L	
		o-Xylene	2011/08/12	<0.4		ug/L	
		m & p-Xylene	2011/08/12	<0.8		ug/L	
		Xylenes (Total)	2011/08/12	<0.8		ug/L	
		F1 (C6-C10) - BTEX	2011/08/12	<100		ug/L	
		(C6-C10)	2011/08/12	<100		ug/L	
	RPD	Benzene	2011/08/12	NC		%	40
		Toluene	2011/08/12	NC		%	40
		Ethylbenzene	2011/08/12	NC		%	40
		o-Xylene	2011/08/12	NC		%	40
		m & p-Xylene	2011/08/12	NC		%	40
		Xylenes (Total)	2011/08/12	NC		%	40

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone(403) 291-3077 Fax(403) 291-9468

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EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP PRINCE ALBER
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: CB171800

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5079260 PX	RPD	F1 (C6-C10) - BTEX	2011/08/12	NC		%	40
		(C6-C10)	2011/08/12	NC		%	40
5079506 TDB	Matrix Spike	Dissolved Antimony (Sb)	2011/08/11		105	%	80 - 120
		Dissolved Chromium (Cr)	2011/08/11		95	%	80 - 120
		Dissolved Cobalt (Co)	2011/08/11		95	%	80 - 120
		Dissolved Copper (Cu)	2011/08/11		84	%	80 - 120
		Dissolved Molybdenum (Mo)	2011/08/11		116	%	80 - 120
		Dissolved Nickel (Ni)	2011/08/11		91	%	80 - 120
		Dissolved Thallium (Tl)	2011/08/11		87	%	80 - 120
		Dissolved Tin (Sn)	2011/08/11		85	%	80 - 120
		Dissolved Titanium (Ti)	2011/08/11		83	%	80 - 120
		Dissolved Uranium (U)	2011/08/11		112	%	80 - 120
		Dissolved Vanadium (V)	2011/08/11		82	%	80 - 120
	Spiked Blank	Dissolved Aluminum (Al)	2011/08/11		99	%	80 - 120
		Dissolved Antimony (Sb)	2011/08/11		101	%	80 - 120
		Dissolved Arsenic (As)	2011/08/11		96	%	85 - 109
		Dissolved Beryllium (Be)	2011/08/11		88	%	80 - 118
		Dissolved Chromium (Cr)	2011/08/11		98	%	80 - 120
		Dissolved Cobalt (Co)	2011/08/11		97	%	80 - 120
		Dissolved Copper (Cu)	2011/08/11		102	%	80 - 120
		Dissolved Lead (Pb)	2011/08/11		97	%	85 - 113
		Dissolved Molybdenum (Mo)	2011/08/11		101	%	80 - 120
		Dissolved Nickel (Ni)	2011/08/11		100	%	82 - 120
		Dissolved Selenium (Se)	2011/08/11		98	%	81 - 120
		Dissolved Silver (Ag)	2011/08/11		84	%	80 - 120
		Dissolved Thallium (Tl)	2011/08/11		96	%	80 - 120
		Dissolved Tin (Sn)	2011/08/11		99	%	80 - 120
		Dissolved Titanium (Ti)	2011/08/11		98	%	80 - 120
		Dissolved Uranium (U)	2011/08/11		101	%	80 - 120
		Dissolved Vanadium (V)	2011/08/11		102	%	80 - 120
		Dissolved Zinc (Zn)	2011/08/11		101	%	80 - 120
	Method Blank	Dissolved Aluminum (Al)	2011/08/11	<0.001		mg/L	
		Dissolved Antimony (Sb)	2011/08/11	<0.0006		mg/L	
		Dissolved Arsenic (As)	2011/08/11	<0.0002		mg/L	
		Dissolved Beryllium (Be)	2011/08/11	<0.001		mg/L	
		Dissolved Chromium (Cr)	2011/08/11	<0.001		mg/L	
		Dissolved Cobalt (Co)	2011/08/11	<0.0003		mg/L	
		Dissolved Copper (Cu)	2011/08/11	<0.0002		mg/L	
		Dissolved Lead (Pb)	2011/08/11	<0.0002		mg/L	
		Dissolved Molybdenum (Mo)	2011/08/11	<0.0002		mg/L	
		Dissolved Nickel (Ni)	2011/08/11	<0.0005		mg/L	
		Dissolved Selenium (Se)	2011/08/11	<0.0002		mg/L	
		Dissolved Silver (Ag)	2011/08/11	<0.0001		mg/L	
		Dissolved Thallium (Tl)	2011/08/11	<0.0002		mg/L	
		Dissolved Tin (Sn)	2011/08/11	<0.001		mg/L	
		Dissolved Titanium (Ti)	2011/08/11	<0.001		mg/L	
		Dissolved Uranium (U)	2011/08/11	<0.0001		mg/L	
		Dissolved Vanadium (V)	2011/08/11	<0.001		mg/L	
		Dissolved Zinc (Zn)	2011/08/11	<0.003		mg/L	
	RPD	Dissolved Aluminum (Al)	2011/08/11	NC		%	20
		Dissolved Antimony (Sb)	2011/08/11	NC		%	20
		Dissolved Arsenic (As)	2011/08/11	1.7		%	20
		Dissolved Beryllium (Be)	2011/08/11	NC		%	20
		Dissolved Chromium (Cr)	2011/08/11	NC		%	20
		Dissolved Cobalt (Co)	2011/08/11	1.9		%	20

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP PRINCE ALBER
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: CB171800

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5079506 TDB	RPD	Dissolved Copper (Cu)	2011/08/11	NC		%	20
		Dissolved Lead (Pb)	2011/08/11	NC		%	20
		Dissolved Molybdenum (Mo)	2011/08/11	2.2		%	20
		Dissolved Nickel (Ni)	2011/08/11	1.7		%	20
		Dissolved Selenium (Se)	2011/08/11	0.4		%	20
		Dissolved Silver (Ag)	2011/08/11	NC		%	20
		Dissolved Thallium (Tl)	2011/08/11	NC		%	20
		Dissolved Tin (Sn)	2011/08/11	NC		%	20
		Dissolved Titanium (Ti)	2011/08/11	NC		%	20
		Dissolved Uranium (U)	2011/08/11	6.2		%	20
		Dissolved Vanadium (V)	2011/08/11	NC		%	20
		Dissolved Zinc (Zn)	2011/08/11	NC		%	20
5080183 JW0	Matrix Spike	F2 (C10-C16 Hydrocarbons)	2011/08/11		102	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2011/08/11		101	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2011/08/11		85	%	50 - 130
	Spiked Blank	F2 (C10-C16 Hydrocarbons)	2011/08/11		112	%	70 - 130
		F3 (C16-C34 Hydrocarbons)	2011/08/11		103	%	70 - 130
		F4 (C34-C50 Hydrocarbons)	2011/08/11		94	%	70 - 130
	Method Blank	F2 (C10-C16 Hydrocarbons)	2011/08/11	<0.1		mg/L	
		F3 (C16-C34 Hydrocarbons)	2011/08/11	<0.1		mg/L	
		F4 (C34-C50 Hydrocarbons)	2011/08/11	<0.1		mg/L	
	RPD	F2 (C10-C16 Hydrocarbons)	2011/08/11	NC		%	40
		F3 (C16-C34 Hydrocarbons)	2011/08/11	NC		%	40
		F4 (C34-C50 Hydrocarbons)	2011/08/11	NC		%	40
5081631 VGG	Matrix Spike	Dissolved Barium (Ba)	2011/08/11		93	%	80 - 120
		Dissolved Boron (B)	2011/08/11		102	%	80 - 120
		Dissolved Calcium (Ca)	2011/08/11		NC	%	80 - 120
		Dissolved Iron (Fe)	2011/08/11		91	%	80 - 120
		Dissolved Lithium (Li)	2011/08/11		94	%	80 - 120
		Dissolved Magnesium (Mg)	2011/08/11		NC	%	80 - 120
		Dissolved Manganese (Mn)	2011/08/11		NC	%	80 - 120
		Dissolved Phosphorus (P)	2011/08/11		106	%	80 - 120
		Dissolved Potassium (K)	2011/08/11		101	%	80 - 120
		Dissolved Silicon (Si)	2011/08/11		NC	%	80 - 120
		Dissolved Sodium (Na)	2011/08/11		NC	%	80 - 120
		Dissolved Strontium (Sr)	2011/08/11		NC	%	80 - 120
	Spiked Blank	Dissolved Barium (Ba)	2011/08/11		96	%	80 - 110
		Dissolved Boron (B)	2011/08/11		104	%	80 - 120
		Dissolved Calcium (Ca)	2011/08/11		102	%	80 - 120
		Dissolved Iron (Fe)	2011/08/11		98	%	80 - 120
		Dissolved Lithium (Li)	2011/08/11		97	%	80 - 120
		Dissolved Magnesium (Mg)	2011/08/11		105	%	80 - 120
		Dissolved Manganese (Mn)	2011/08/11		99	%	86 - 110
		Dissolved Phosphorus (P)	2011/08/11		102	%	80 - 120
		Dissolved Potassium (K)	2011/08/11		103	%	80 - 120
		Dissolved Silicon (Si)	2011/08/11		100	%	80 - 120
		Dissolved Sodium (Na)	2011/08/11		99	%	81 - 112
		Dissolved Strontium (Sr)	2011/08/11		99	%	80 - 120
	Method Blank	Dissolved Barium (Ba)	2011/08/11	<0.01		mg/L	
		Dissolved Boron (B)	2011/08/11	<0.02		mg/L	
		Dissolved Calcium (Ca)	2011/08/11	<0.3		mg/L	
		Dissolved Iron (Fe)	2011/08/11	<0.06		mg/L	
		Dissolved Lithium (Li)	2011/08/11	<0.02		mg/L	
		Dissolved Magnesium (Mg)	2011/08/11	<0.2		mg/L	
		Dissolved Manganese (Mn)	2011/08/11	<0.004		mg/L	

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP PRINCE ALBER
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: CB171800

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5081631 VGG	Method Blank	Dissolved Phosphorus (P)	2011/08/11	<0.1		mg/L	
		Dissolved Potassium (K)	2011/08/11	<0.3		mg/L	
		Dissolved Silicon (Si)	2011/08/11	<0.1		mg/L	
		Dissolved Sodium (Na)	2011/08/11	<0.5		mg/L	
		Dissolved Strontium (Sr)	2011/08/11	<0.02		mg/L	
		Dissolved Sulphur (S)	2011/08/11	<0.2		mg/L	
	RPD	Dissolved Barium (Ba)	2011/08/11	2.3		%	20
		Dissolved Boron (B)	2011/08/11	16.2		%	20
		Dissolved Calcium (Ca)	2011/08/11	0.8		%	20
		Dissolved Iron (Fe)	2011/08/11	1.6		%	20
		Dissolved Lithium (Li)	2011/08/11	3.7		%	20
		Dissolved Magnesium (Mg)	2011/08/11	2.1		%	20
		Dissolved Manganese (Mn)	2011/08/11	1.6		%	20
		Dissolved Phosphorus (P)	2011/08/11	NC		%	20
		Dissolved Potassium (K)	2011/08/11	3.1		%	20
		Dissolved Silicon (Si)	2011/08/11	1.7		%	20
		Dissolved Sodium (Na)	2011/08/11	3.5		%	20
		Dissolved Strontium (Sr)	2011/08/11	2.6		%	20
		Dissolved Sulphur (S)	2011/08/11	4.8		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
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.

Validation Signature Page

Maxxam Job #: B171800

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

Ghayasuddin Khan, M.Sc., B.Ed., P.Chem, Senior Analyst, Water Lab

Junzhi Gao

Janet Gao, Senior Analyst, Organics Department

==

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 A074133

Page: 1 of 2

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐	Report Distribution (E-Mail):
Company:	EZE ENGINEERING		apassalis@mts.net
Contact:	D. KLASSEN		david.klassen@mts.net
Address:	511 PEPPERLOAF CRES.		lbielus@mts.net
	Prov: WPG, MB PC: R3R1E6	Prov: PC:	
Contact #s:	Ph: 204-896-8264 Cell: 612-0944	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 #:	0125-036-01
Project # / Name:	RCMP PRINCE ALBERT
Site Location:	190 AIRPORT ROAD
Quote #:	
Sampled By:	A. PASSALIS

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: ☐BTEX F1 ☐VOCs	WATER: ☐BTEX F1-F2 ☒BTEX F1-F4	WATER: ☐ Routine Water ☐ Turb ☐ F	WATER: ☐ TOC ☐ DOC	WATER: Regulated Metals (CCME / AT1) Total	WATER: Regulated Metals Dissolved	WATER: Mercury ☐ Total ☒ Dissolved	Other Analysis: VOCS	Other Analysis: GLYCOL	Other Analysis: O+G	HOLD - Do not Analyze	# of Containers Submitted
1	PA-03		GW	11/08/04												X			X			4
2	PA-04		"	"								X				X		X	X	X		14
3	PA-06		"	"								X										5
4	PA-07		"	"								X										5
5	PA-09		"	"								X										5
6	PA-10		"	"								X										5
7	PA-11		"	"								X				X		X	X	X		14
8	PA-12		"	"								X										5
9	PA-13		"	"								X										5
10	PA-14		"	"								X										5
11	BDW1		"	"								X				X		X	X	X		14
12	PA-17		"	"								X										5

Please indicate Filtered, Preserved or Both (F, P, F/P) → F/P

Relinquished By (Signature/Print):	Date (YY/MM/DD): 11/08/05	Time (24:00):
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions:
- CHROMATOGRAMS REQUIRED ON ALL SAMPLES.
- METALS TO BE LAB FILTERED/PRES.

\# of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: CB171800		
School Rasput	RECEIVED AUG 06 2011 9:40		Custody Seal	Temperature	Ice
Lab Comments:			N	7.8, 10, 5.9 / 12.0, 11.2, 9.3 / 8.6, 8.3, 9.1 / 7.1, 6.6, 8.9	Y

AB FCD-00331 Rev3 2010/05

Maxxam Analytics International Corporation o/a Maxxam Analytics

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
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Chain of Custody A074134

Page: 2 of 2

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐	Report Distribution (E-Mail):
Company:	EGE ENGINEERING		
Contact:			
Address:			
	Prov: PC:	Prov: PC:	
Contact #s:	Ph: 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 #:	0125-036-01
Project # / Name:	RCMP PRINCE ALBERT
Site Location:	
Quote #:	
Sampled By:	

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: ☐BTEX F1 ☐VOCs	WATER: ☐BTEX F1-F2 ☒BTEX F1-F4	WATER: ☐ Routine Water ☐ Turb ☐ F	WATER: ☐ TOC ☐ DOC	WATER: Regulated Metals (CCME / AT1) Total	WATER: Regulated Metals Dissolved	WATER: Mercury ☐ Total ☐ Dissolved	Other Analysis: FUEL PRODUCT CHARACTERIZATION	HOLD - Do not Analyze	# of Containers Submitted
1	MW-1		GW	11/08/04								X								5
2	MW-4											X								5
3	BDW2											X								5
4																				
5	PA-08-P		PRODUCT	11/08/04														X		5
6	UST-P																	X		5
7	MW-2-P																	X		5
8	MWSE-P																	X		5
9																				
10	PA-FB											X								5
11	PA-TRIP BLANK											X								5
12																				

Please indicate Filtered, Preserved or Both (F, P, F/P) → F/P

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
[signature]	11/08/05	
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions: FUEL PRODUCT CHARACTERIZATION - CALL TO DISCUSS
METALS TO BE LAB FILTERED / PRES

# of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #:		
Sohail Rapat	11/08/05	13:30	Custody Seal	Temperature	Ice
Lab Comments: RECEIVED AUG 06 2011 [illegible] 9:40			N	7.8, 10.0, 5.1, 12.0, 11.6, 9.3, 8.6, 8.3, 9.1, 7.1, 6.6, 8.9	Y

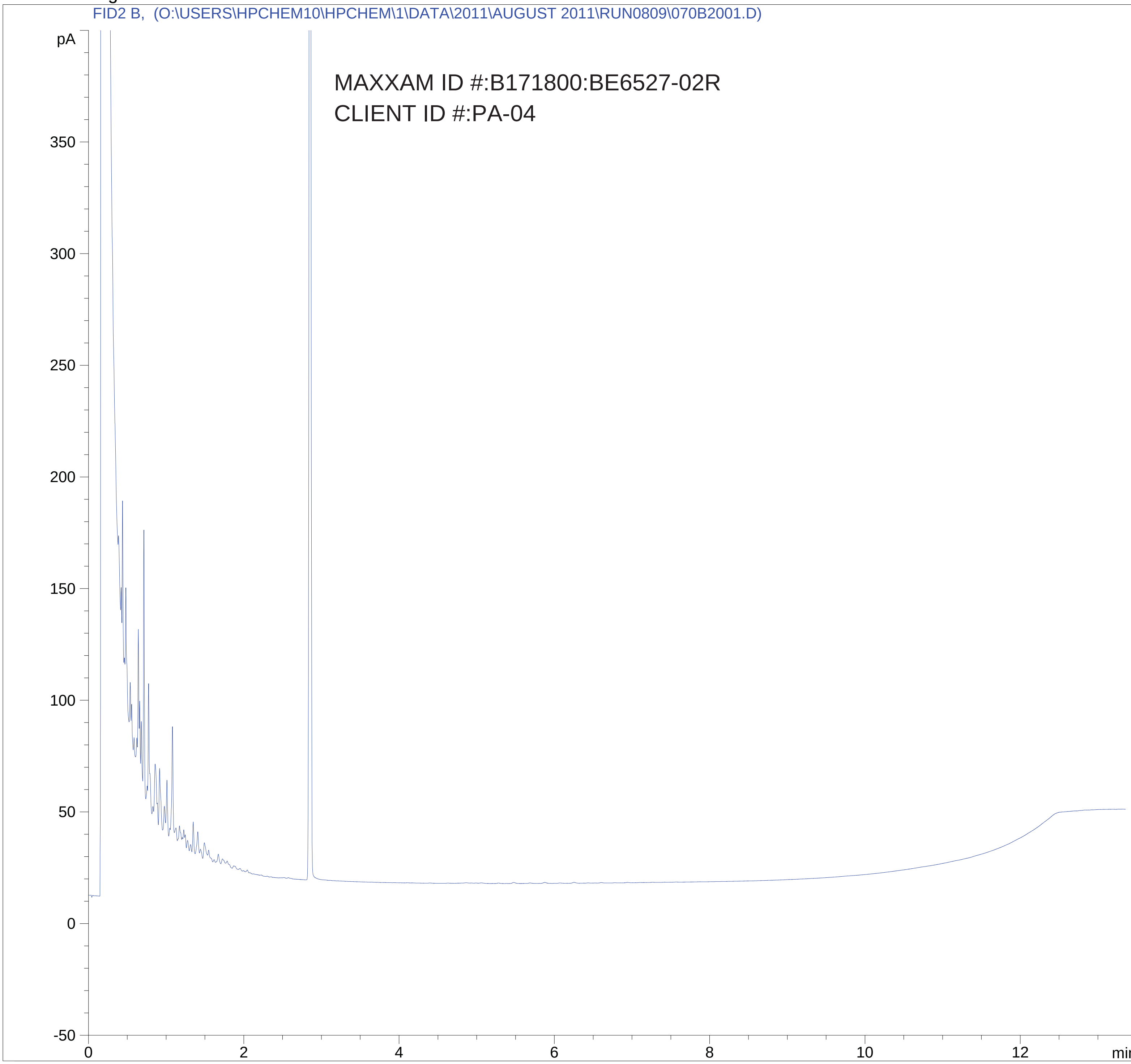
AB FCD-00331 Rev3 2010/05

Maxxam Analytics International Corporation o/a Maxxam Analytics

===

Acq. Operator	:	Seq. Line :	20
Acq. Instrument	: Instrument 1	Location :	Vial 70
Injection Date	: 2011/08/09 8:59:12 PM	Inj :	1
		Inj Volume :	1 µl

Acq. Method : C:\CHEM32\1\METHODS\RUN0809.M
Last changed : 2011/08/09 8:44:16 PM
(modified after loading)
Analysis Method : O:\USERS\HPCHEM6\HPCHEM\1\METHODS\CCM0725R.M
Last changed : 2011/07/26 3:27:39 PM

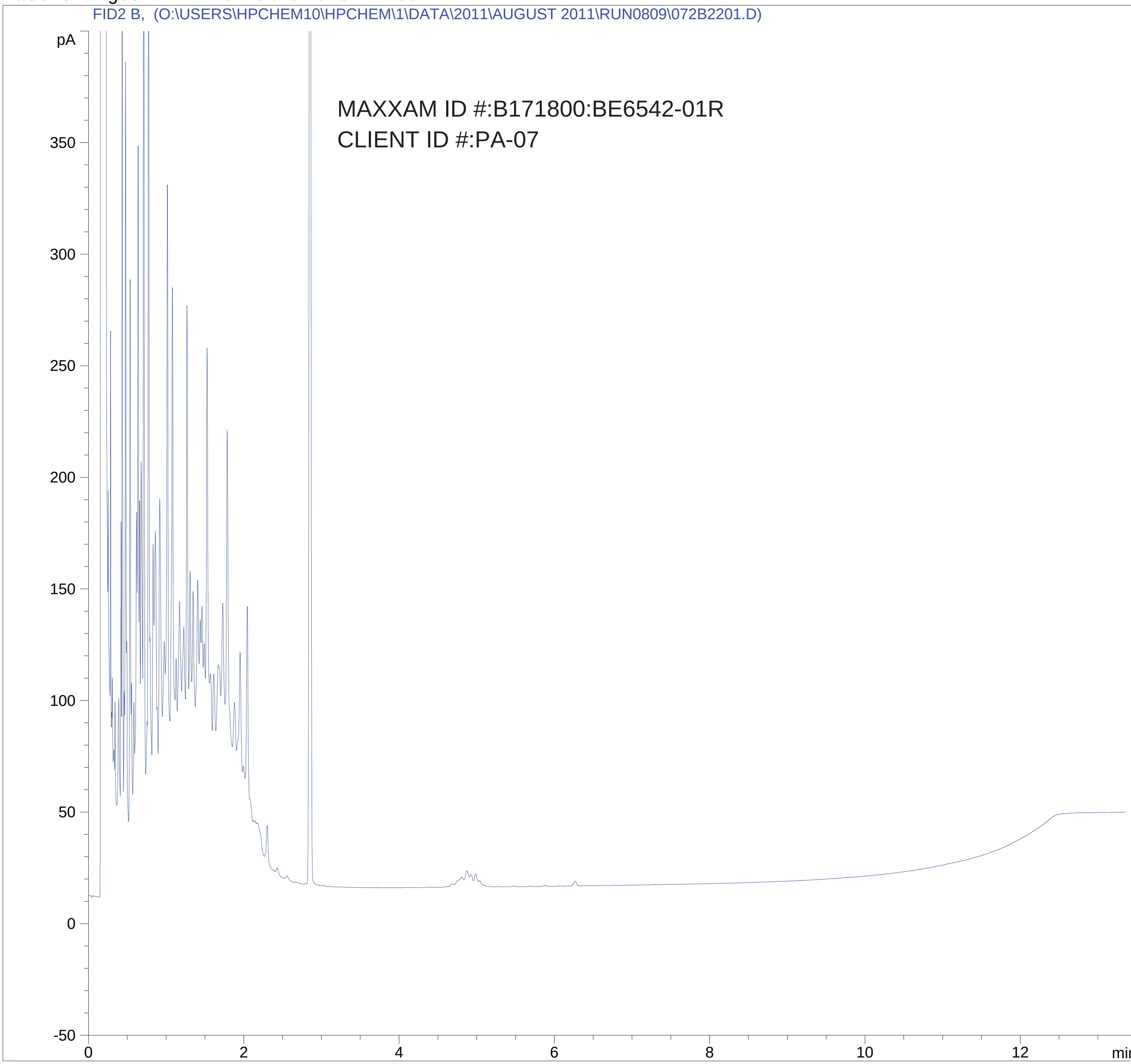


Data File O:\USERS\HPCHEM10\HPCHEM\1\DATA\2011\AUGUST 2011\RUN0809\072B2201.D
Sample Name: 5072881:BE6542

===

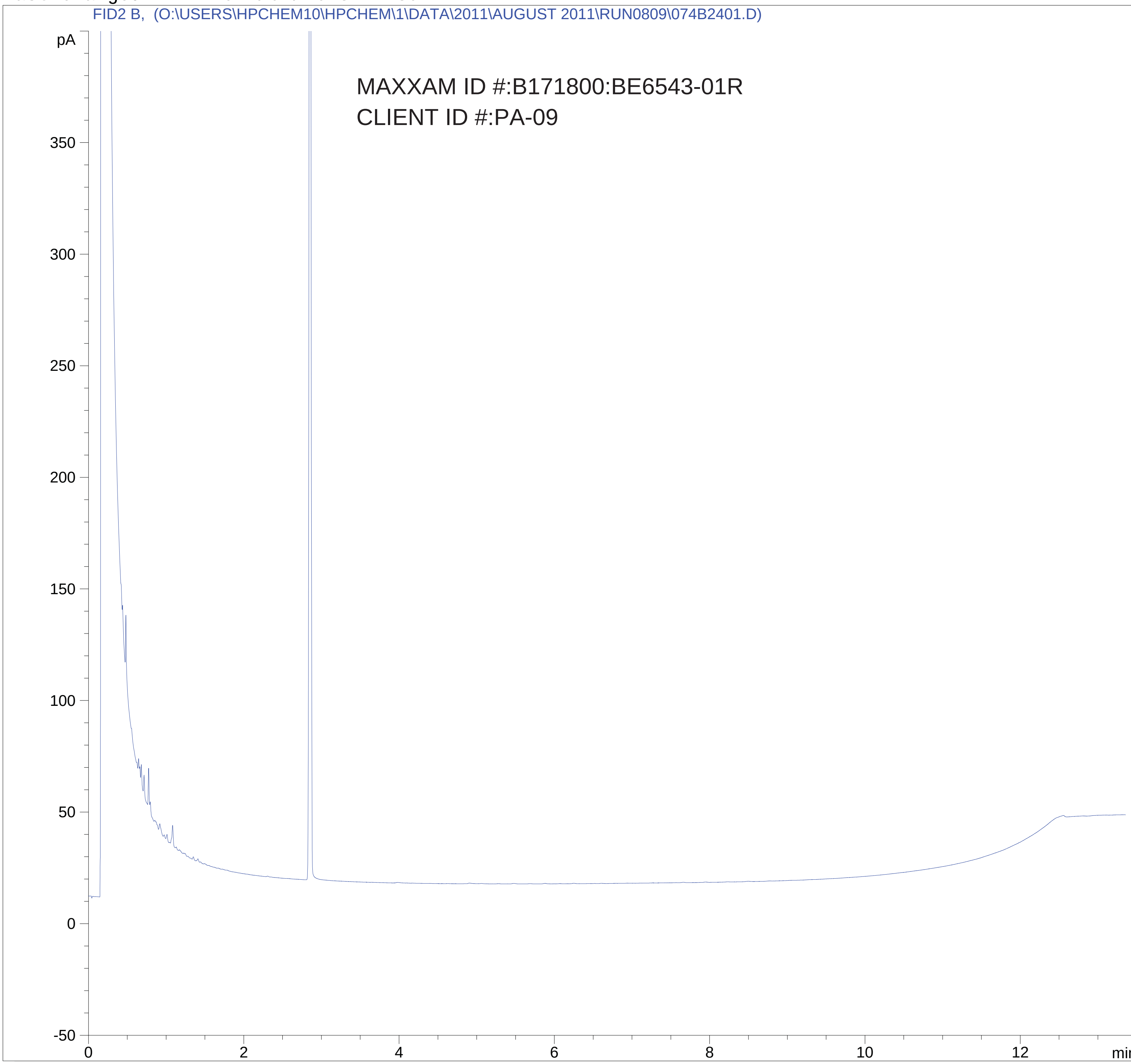
Acq. Operator	:	Seq. Line :	22
Acq. Instrument	: Instrument 1	Location :	Vial 72
Injection Date	: 2011/08/09 9:55:22 PM	Inj :	1
		Inj Volume :	1 µl

Acq. Method : C:\CHEM32\1\METHODS\RUN0809.M
Last changed : 2011/08/09 9:40:41 PM
(modified after loading)
Analysis Method : O:\USERS\HPCHEM6\HPCHEM\1\METHODS\CCM0725R.M
Last changed : 2011/07/26 3:27:39 PM



===

Acq. Operator : Seq. Line : 24
Acq. Instrument : Instrument 1 Location : Vial 74
Injection Date : 2011/08/09 10:51:17 PM Inj : 1
Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\METHODS\RUN0809.M
Last changed : 2011/08/09 10:36:47 PM
(modified after loading)
Analysis Method : O:\USERS\HPCHEM6\HPCHEM\1\METHODS\CCM0725R.M
Last changed : 2011/07/26 3:27:39 PM

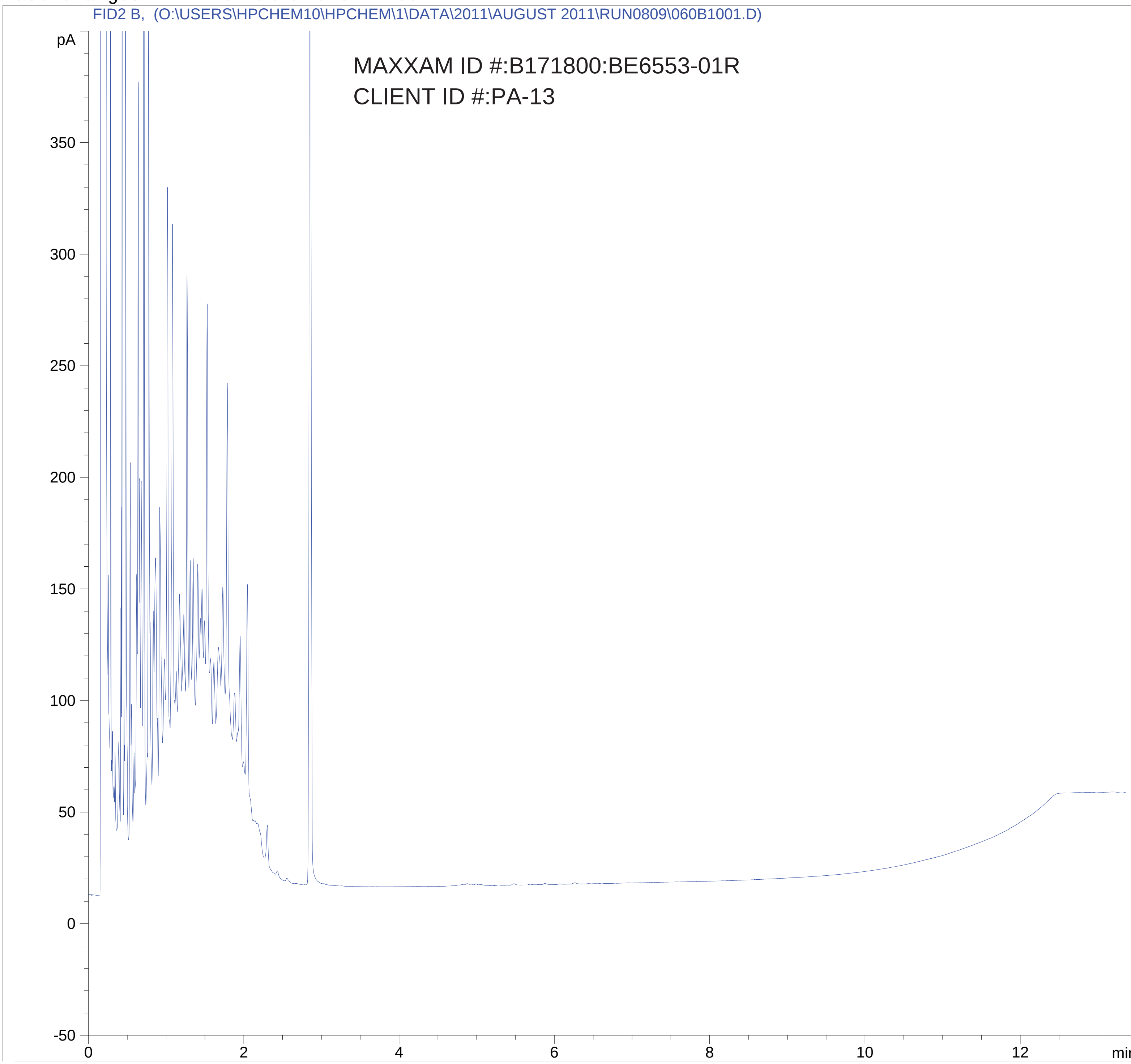


Data File O:\USERS\HPCHEM10\HPCHEM\1\DATA\2011\AUGUST 2011\RUN0809\060B1001.D
Sample Name: 5072881:BE6553

===

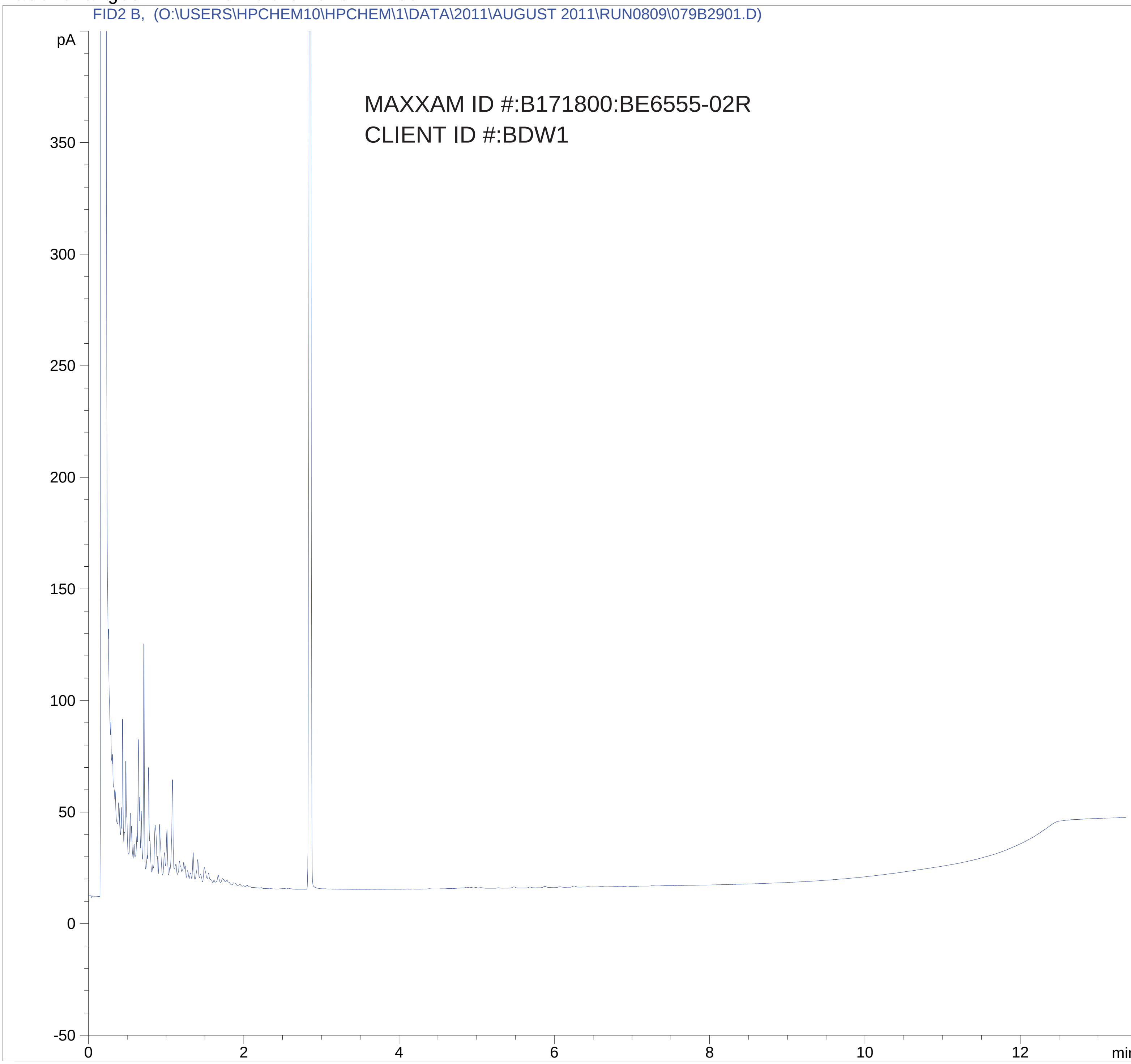
Acq. Operator	:	Seq. Line :	10
Acq. Instrument	: Instrument 1	Location :	Vial 60
Injection Date	: 2011/08/09 4:13:02 PM	Inj :	1
		Inj Volume :	1 µl

Acq. Method : C:\CHEM32\1\METHODS\RUN0809.M
Last changed : 2011/08/09 3:57:16 PM
(modified after loading)
Analysis Method : O:\USERS\HPCHEM6\HPCHEM\1\METHODS\CCM0725R.M
Last changed : 2011/07/26 3:27:39 PM



===

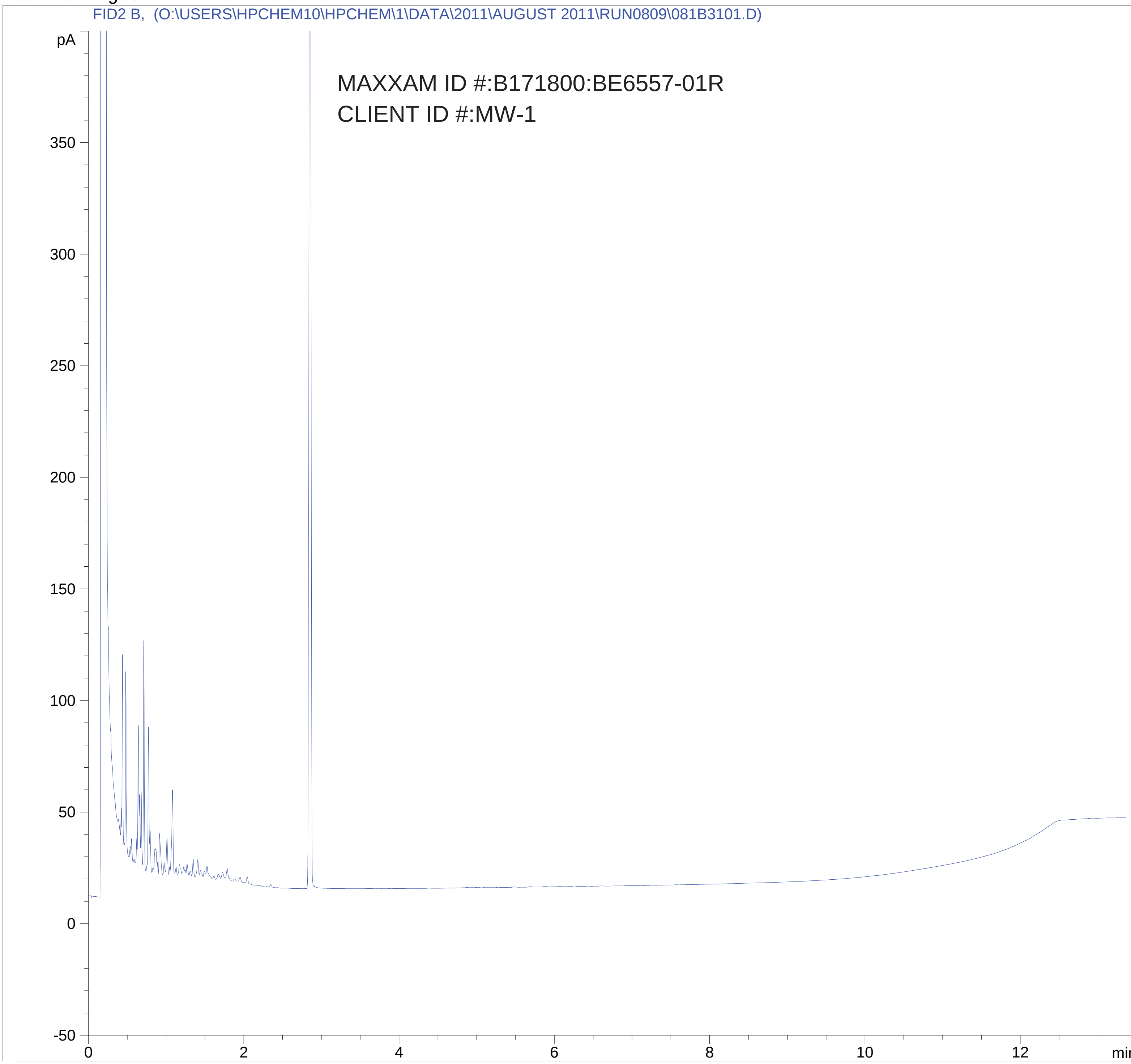
Acq. Operator	:	Seq. Line :	29
Acq. Instrument	: Instrument 1	Location :	Vial 79
Injection Date	: 2011/08/10 1:09:58 AM	Inj :	1
		Inj Volume :	1 µl
Acq. Method	: C:\CHEM32\1\METHODS\RUN0809.M		
Last changed	: 2011/08/10 12:55:46 AM (modified after loading)		
Analysis Method	: O:\USERS\HPCHEM6\HPCHEM\1\METHODS\CCM0725R.M		
Last changed	: 2011/07/26 3:27:39 PM		



===

Acq. Operator	:	Seq. Line :	31
Acq. Instrument	: Instrument 1	Location :	Vial 81
Injection Date	: 2011/08/10 2:05:03 AM	Inj :	1
		Inj Volume :	1 µl

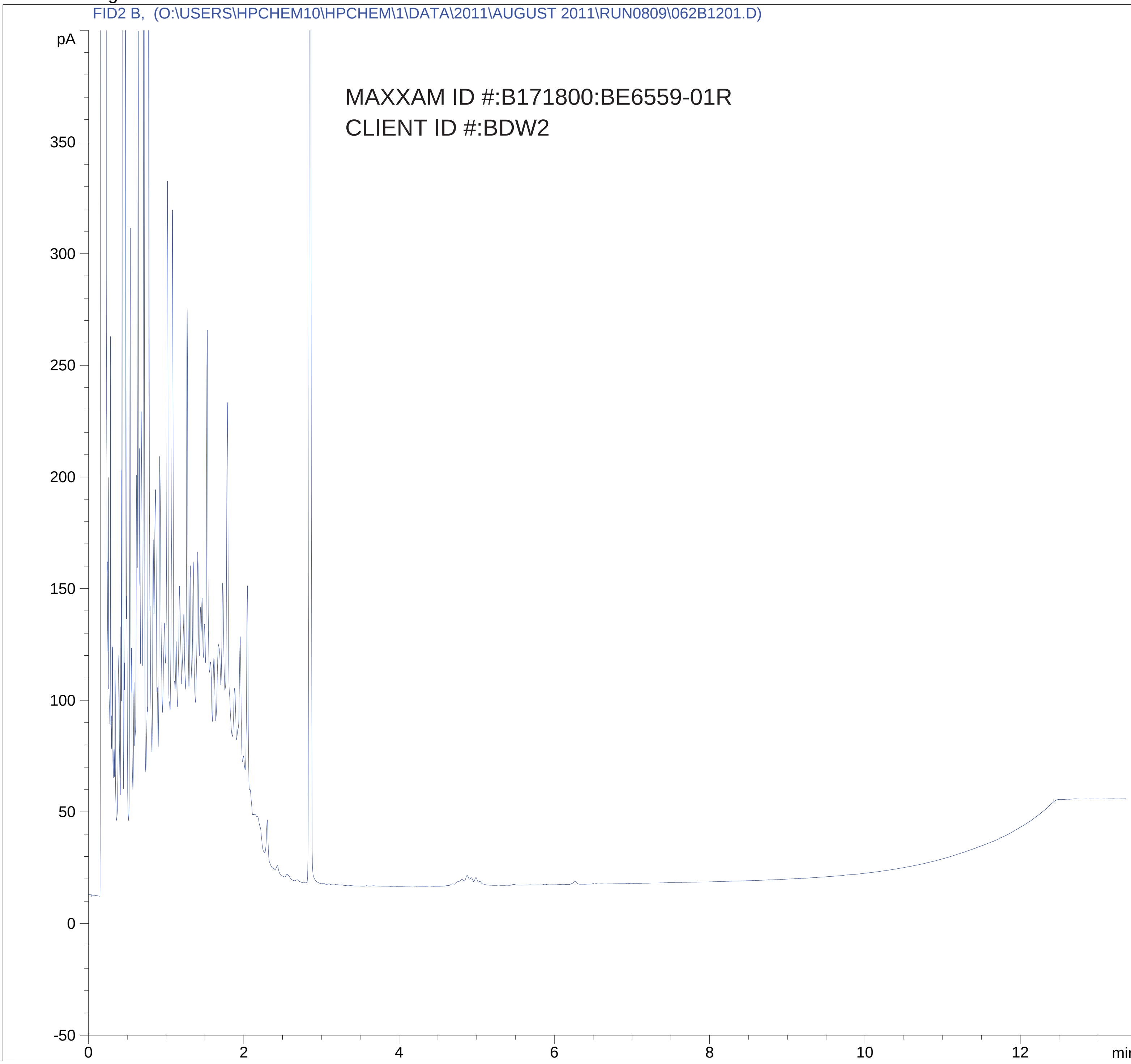
Acq. Method : C:\CHEM32\1\METHODS\RUN0809.M
Last changed : 2011/08/10 1:50:56 AM
(modified after loading)
Analysis Method : O:\USERS\HPCHEM6\HPCHEM\1\METHODS\CCM0725R.M
Last changed : 2011/07/26 3:27:39 PM



Data File O:\USERS\HPCHEM10\HPCHEM\1\DATA\2011\AUGUST 2011\RUN0809\062B1201.D
Sample Name: 5072881:BE6559

===

Acq. Operator : Seq. Line : 12
Acq. Instrument : Instrument 1 Location : Vial 62
Injection Date : 2011/08/09 5:11:11 PM Inj : 1
Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\METHODS\RUN0809.M
Last changed : 2011/08/09 4:55:31 PM
(modified after loading)
Analysis Method : O:\USERS\HPCHEM6\HPCHEM\1\METHODS\CCM0725R.M
Last changed : 2011/07/26 3:27:39 PM

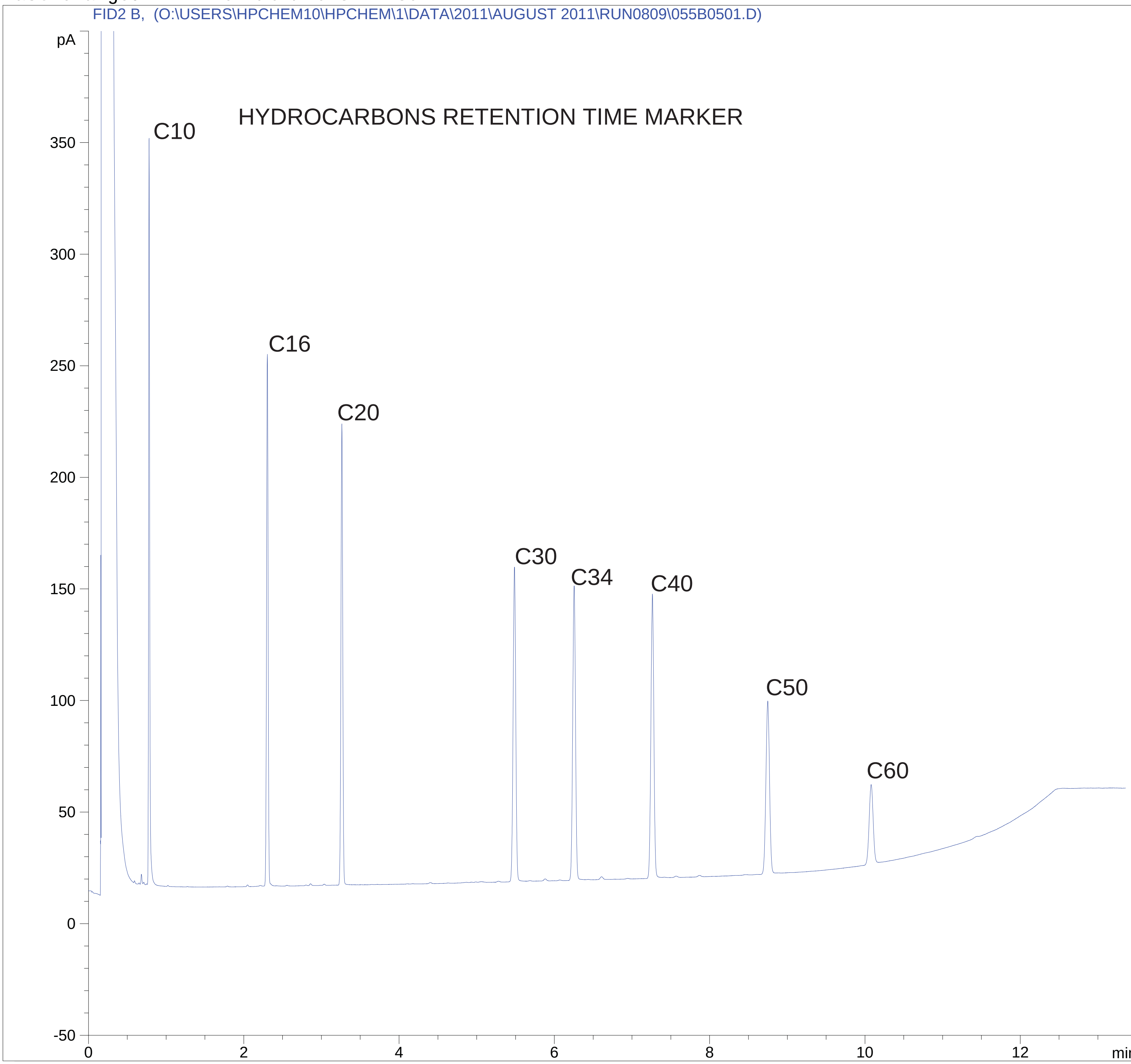


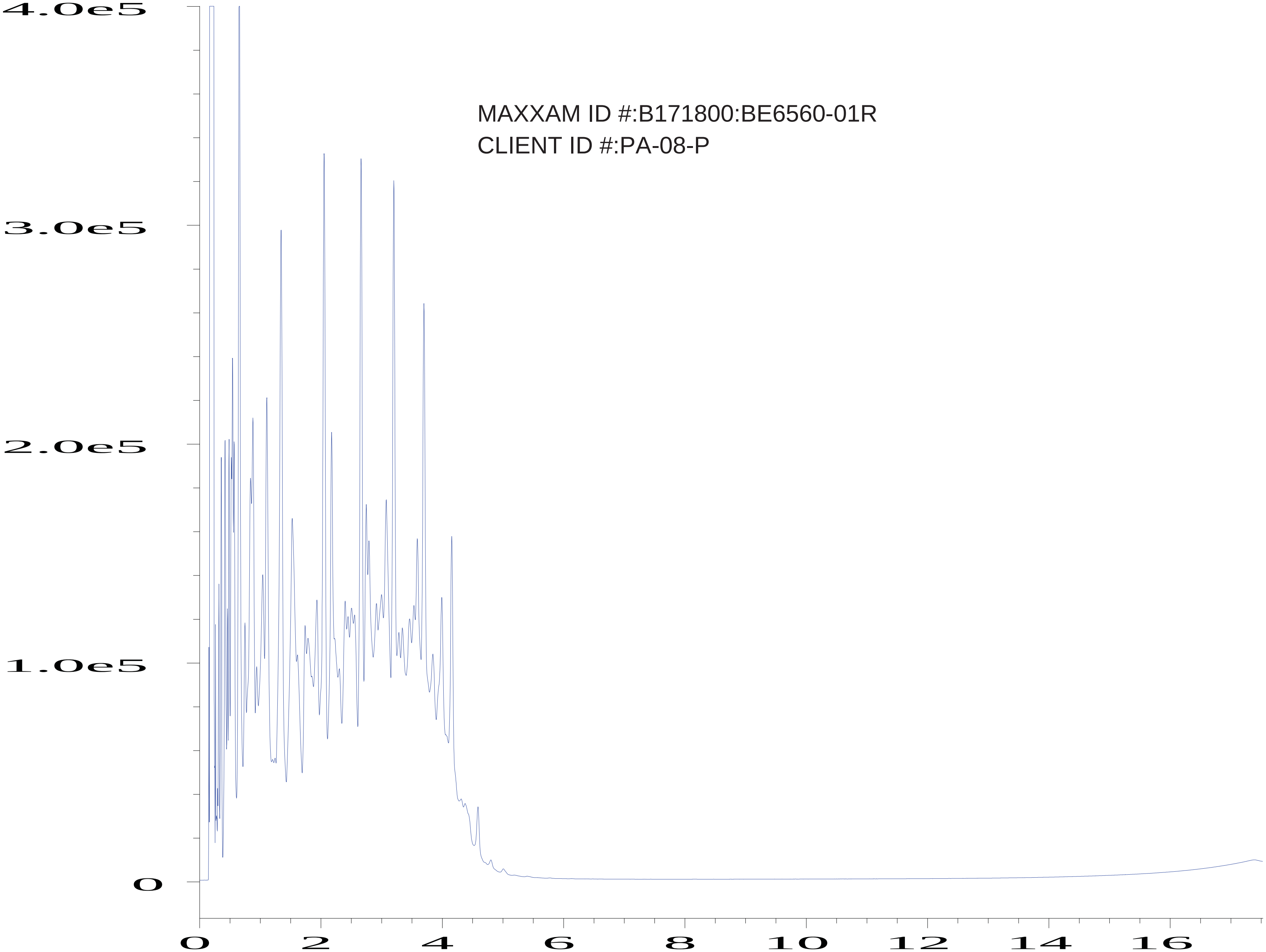
Data File O:\USERS\HPCHEM10\HPCHEM\1\DATA\2011\AUGUST 2011\RUN0809\055B0501.D
Sample Name: RT MARKER

===

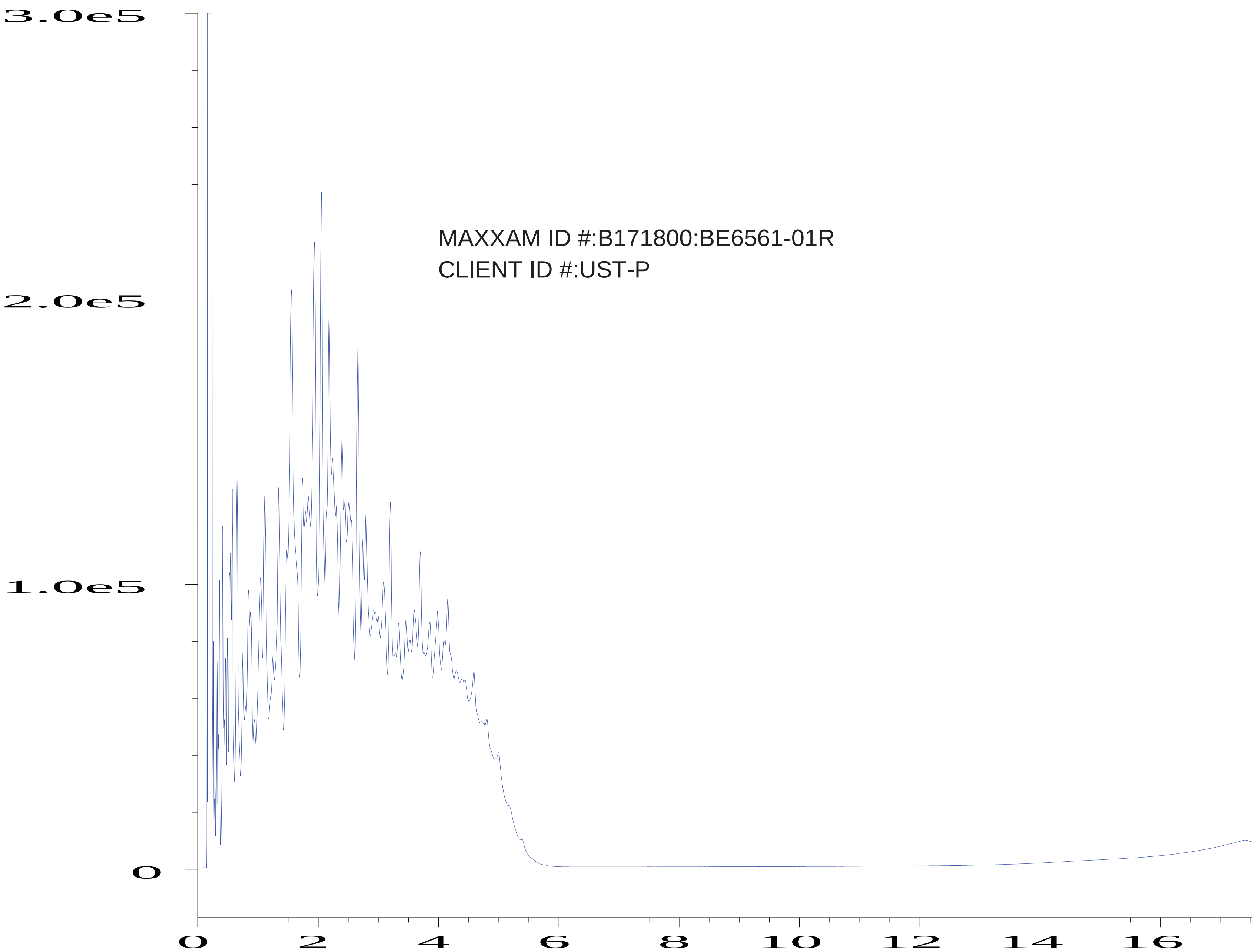
Acq. Operator	:	Seq. Line :	5
Acq. Instrument	: Instrument 1	Location :	Vial 55
Injection Date	: 2011/08/09 1:47:47 PM	Inj :	1
		Inj Volume :	1 µl

Acq. Method : C:\CHEM32\1\METHODS\RUN0809.M
Last changed : 2011/08/09 1:32:36 PM
(modified after loading)
Analysis Method : O:\USERS\HPCHEM6\HPCHEM\1\METHODS\CCM0725R.M
Last changed : 2011/07/26 3:27:39 PM

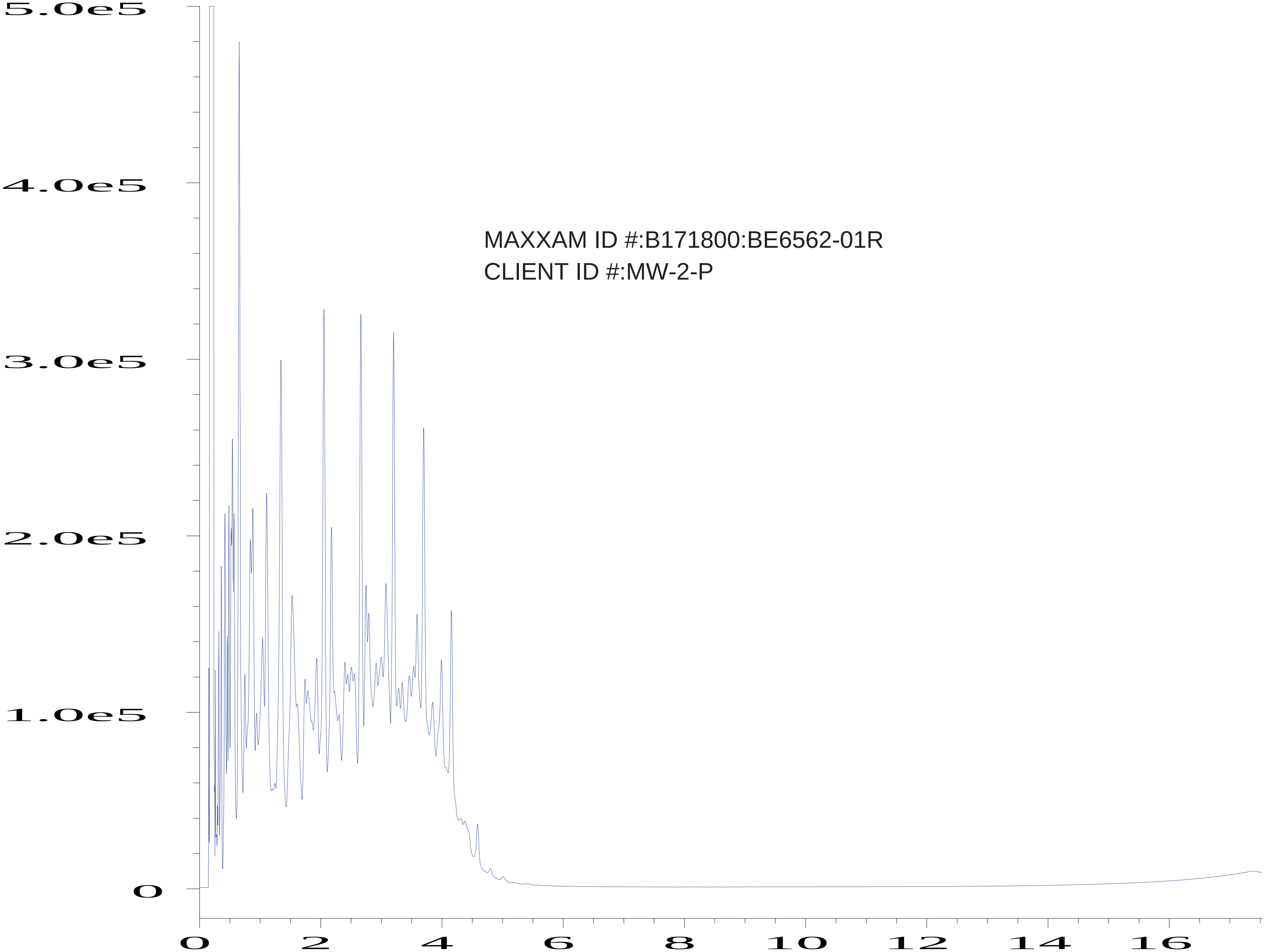




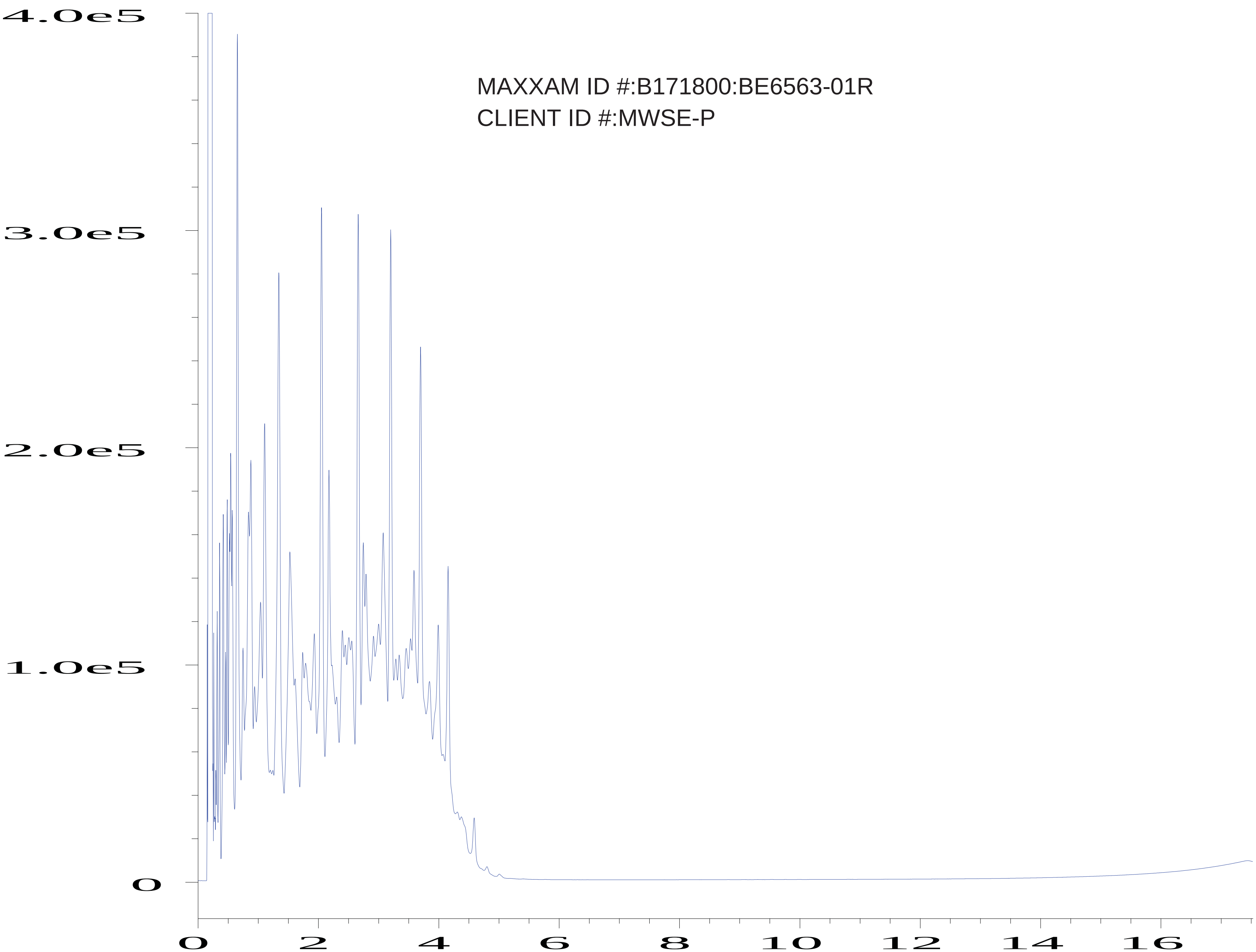
Data File Name	: O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\093R0101.D		
Operator	: GC 9 FID	Page Number	: 1
Instrument	: INSTRUMEN	Vial Number	: 93
Sample Name	: 5080183:6560:100	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 12 Aug 11 10:24 AM	Instrument Method:	RUN0811F.MTH
Report Created on:	12 Aug 11 12:57 PM	Analysis Method	: CCM0811R.MTH



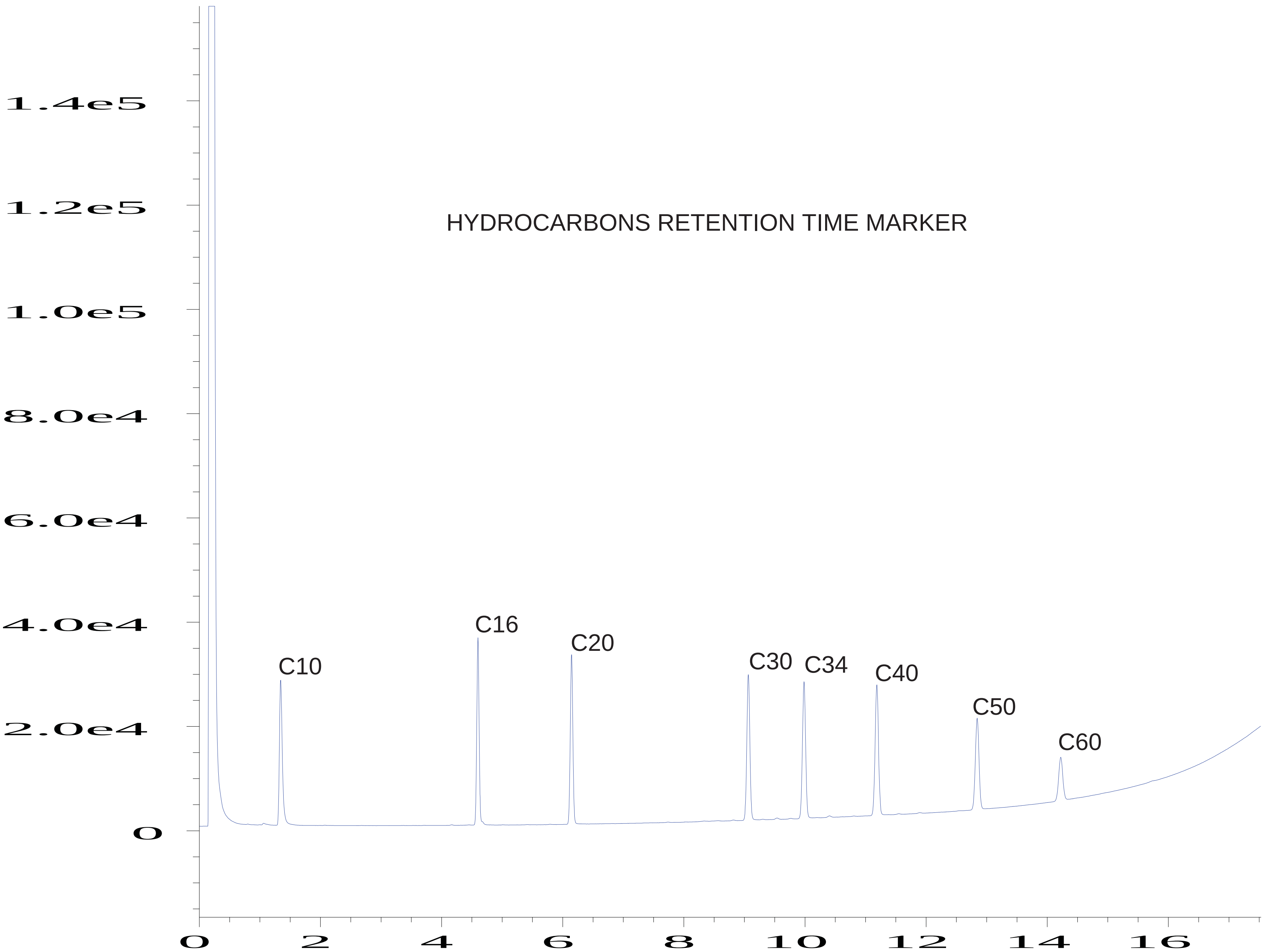
Data File Name	: O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\095R0101.D		
Operator	: GC 9 FID	Page Number	: 1
Instrument	: INSTRUMEN	Vial Number	: 95
Sample Name	: 5080183:6561:100	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 12 Aug 11 11:23 AM	Instrument Method:	RUN0811F.MTH
Report Created on:	12 Aug 11 12:58 PM	Analysis Method	: CCM0811R.MTH



Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\096R0101.D
Operator : GC 9 FID Page Number : 1
Instrument : INSTRUMEN Vial Number : 96
Sample Name : 5080183:6562:100 Injection Number : 1
Run Time Bar Code: Sequence Line : 1
Acquired on : 12 Aug 11 11:52 AM Instrument Method: RUN0811F.MTH
Report Created on: 12 Aug 11 01:00 PM Analysis Method : CCM0811R.MTH



Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\097R0101.D
Operator : GC 9 FID
Instrument : INSTRUMEN
Sample Name : 5080183:6563:100
Run Time Bar Code:
Acquired on : 12 Aug 11 12:21 PM
Report Created on: 12 Aug 11 01:00 PM
Page Number : 1
Vial Number : 97
Injection Number : 1
Sequence Line : 1
Instrument Method: RUN0811F.MTH
Analysis Method : CCM0811R.MTH



Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\055R0201.D
Operator : GC 9 FID Page Number : 1
Instrument : INSTRUMEN Vial Number : 55
Sample Name : RT MARKER Injection Number : 1
Run Time Bar Code: Sequence Line : 2
Acquired on : 11 Aug 11 03:28 PM Instrument Method: RUN0811F.MTH
Report Created on: 12 Aug 11 11:35 AM Analysis Method : CCM0811R.MTH

The chromatograms are provided for information purposes only. Any conclusion drawn by the data user from these chromatograms is their sole responsibility. Maxxam can assume no liability for any such 3rd party interpretations and is responsible only for the quality of the quantitative data provided.

Maxxam

Success Through Science®

Your Project #: RCMP PRINCE ALBERT
Your C.O.C. #: A074341

Attention: ANDREW PASSALIS
EGE ENGINEERING LTD.
511 PEPPERLOAF CRESENT
WINNIPEG, MB
CANADA R3R 1E6

Report Date: 2011/08/30

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B179198
Received: 2011/08/24, 16:00

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS	2	N/A	2011/08/27	CAL SOP-00190	CCME CWS, EPA 8260C
CCME Hydrocarbons (F2-F4 in water)	2	2011/08/26	2011/08/27	CAL SOP-00086 AB SOP-00037	EPA3510C/CCME PHCCWS

Encryption Key

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

Cynny Hagen, Project Manager
Email: CHagen@maxxam.ca
Phone# (403) 735-2239 Ext:2239

==
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Total cover pages: 1

Sample Details/Parameters	Result	RDL	Units	Extracted	Analyzed	By	Batch
BI7607 PA-02							
Sampling Date 2011/08/24							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	1.0	0.1	mg/L	2011/08/26	2011/08/27	JW0	5125718
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L	2011/08/26	2011/08/27	JW0	5125718
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L	2011/08/26	2011/08/27	JW0	5125718
Reached Baseline at C50	YES		mg/L	2011/08/26	2011/08/27	JW0	5125718
O-TERPHENYL (sur.)	104	50 - 130	%	2011/08/26	2011/08/27	JW0	5125718
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	14	0.4	ug/L	2011/08/25	2011/08/27	RSA	5124961
Toluene	75	0.4	ug/L	2011/08/25	2011/08/27	RSA	5124961
Ethylbenzene	31	0.4	ug/L	2011/08/25	2011/08/27	RSA	5124961
o-Xylene	120	0.4	ug/L	2011/08/25	2011/08/27	RSA	5124961
m & p-Xylene	170	0.8	ug/L	2011/08/25	2011/08/27	RSA	5124961
Xylenes (Total)	290	0.8	ug/L	2011/08/25	2011/08/27	RSA	5124961
F1 (C6-C10) - BTEX	580	100	ug/L	2011/08/25	2011/08/27	RSA	5124961
(C6-C10)	980	100	ug/L	2011/08/25	2011/08/27	RSA	5124961
1,4-Difluorobenzene (sur.)	93	70 - 130	%	2011/08/25	2011/08/27	RSA	5124961
4-BROMOFLUOROBENZENE (sur.)	99	70 - 130	%	2011/08/25	2011/08/27	RSA	5124961
D4-1,2-DICHLOROETHANE (sur.)	122	70 - 130	%	2011/08/25	2011/08/27	RSA	5124961
BI7608 TB-PA							
Sampling Date							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L	2011/08/26	2011/08/27	JW0	5125718
Dup. F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L	2011/08/26	2011/08/27	JW0	5125718
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L	2011/08/26	2011/08/27	JW0	5125718
Dup. F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L	2011/08/26	2011/08/27	JW0	5125718
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L	2011/08/26	2011/08/27	JW0	5125718
Dup. F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L	2011/08/26	2011/08/27	JW0	5125718
Reached Baseline at C50	YES		mg/L	2011/08/26	2011/08/27	JW0	5125718
Dup. Reached Baseline at C50	YES		mg/L	2011/08/26	2011/08/27	JW0	5125718
O-TERPHENYL (sur.)	100	50 - 130	%	2011/08/26	2011/08/27	JW0	5125718
Dup. O-TERPHENYL (sur.)	103	50 - 130	%	2011/08/26	2011/08/27	JW0	5125718
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L	2011/08/25	2011/08/27	RSA	5124961
Toluene	<0.4	0.4	ug/L	2011/08/25	2011/08/27	RSA	5124961
Ethylbenzene	<0.4	0.4	ug/L	2011/08/25	2011/08/27	RSA	5124961
o-Xylene	<0.4	0.4	ug/L	2011/08/25	2011/08/27	RSA	5124961
m & p-Xylene	<0.8	0.8	ug/L	2011/08/25	2011/08/27	RSA	5124961
Xylenes (Total)	<0.8	0.8	ug/L	2011/08/25	2011/08/27	RSA	5124961
F1 (C6-C10) - BTEX	<100	100	ug/L	2011/08/25	2011/08/27	RSA	5124961
(C6-C10)	<100	100	ug/L	2011/08/25	2011/08/27	RSA	5124961
1,4-Difluorobenzene (sur.)	97	70 - 130	%	2011/08/25	2011/08/27	RSA	5124961
4-BROMOFLUOROBENZENE (sur.)	98	70 - 130	%	2011/08/25	2011/08/27	RSA	5124961
D4-1,2-DICHLOROETHANE (sur.)	119	70 - 130	%	2011/08/25	2011/08/27	RSA	5124961

Package 1	10.0°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Results relate only to the items tested.

Maxxam

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EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: RCMP PRINCE ALBERT
P.O. #:
Site Location:

Quality Assurance Report

Maxxam Job Number: CB179198

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5124961 RSA	Matrix Spike	1,4-Difluorobenzene (sur.)	2011/08/27		93	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/08/27		113	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/27		115	%	70 - 130
		Benzene	2011/08/27		99	%	70 - 130
		Toluene	2011/08/27		99	%	70 - 130
		Ethylbenzene	2011/08/27		99	%	70 - 130
		o-Xylene	2011/08/27		90	%	70 - 130
		m & p-Xylene	2011/08/27		87	%	70 - 130
		(C6-C10)	2011/08/27		71	%	70 - 130
	Spiked Blank	1,4-Difluorobenzene (sur.)	2011/08/27		97	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/08/27		102	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/27		117	%	70 - 130
		Benzene	2011/08/27		92	%	70 - 130
		Toluene	2011/08/27		87	%	70 - 130
		Ethylbenzene	2011/08/27		88	%	70 - 130
		o-Xylene	2011/08/27		81	%	70 - 130
		m & p-Xylene	2011/08/27		79	%	70 - 130
		(C6-C10)	2011/08/27		72	%	70 - 130
	Method Blank	1,4-Difluorobenzene (sur.)	2011/08/27		97	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/08/27		96	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/27		113	%	70 - 130
		Benzene	2011/08/27	<0.4		ug/L	
		Toluene	2011/08/27	<0.4		ug/L	
		Ethylbenzene	2011/08/27	<0.4		ug/L	
		o-Xylene	2011/08/27	<0.4		ug/L	
		m & p-Xylene	2011/08/27	<0.8		ug/L	
		Xylenes (Total)	2011/08/27	<0.8		ug/L	
		F1 (C6-C10) - BTEX	2011/08/27	<100		ug/L	
		(C6-C10)	2011/08/27	<100		ug/L	
	RPD	Benzene	2011/08/27	NC		%	40
		Toluene	2011/08/27	NC		%	40
		Ethylbenzene	2011/08/27	NC		%	40
		o-Xylene	2011/08/27	NC		%	40
		m & p-Xylene	2011/08/27	NC		%	40
		Xylenes (Total)	2011/08/27	NC		%	40
		F1 (C6-C10) - BTEX	2011/08/27	NC		%	40
		(C6-C10)	2011/08/27	NC		%	40
5125718 JW0	Matrix Spike	O-TERPHENYL (sur.)	2011/08/27		103	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/27		114	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2011/08/27		102	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2011/08/27		118	%	50 - 130
	Spiked Blank	O-TERPHENYL (sur.)	2011/08/27		103	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/27		126	%	70 - 130
		F3 (C16-C34 Hydrocarbons)	2011/08/27		112	%	70 - 130
		F4 (C34-C50 Hydrocarbons)	2011/08/27		124	%	70 - 130
	Method Blank	O-TERPHENYL (sur.)	2011/08/27		103	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/27	<0.1		mg/L	
		F3 (C16-C34 Hydrocarbons)	2011/08/27	<0.1		mg/L	
		F4 (C34-C50 Hydrocarbons)	2011/08/27	<0.1		mg/L	
	RPD [BI7608-01]	F2 (C10-C16 Hydrocarbons)	2011/08/27	NC		%	40
		F3 (C16-C34 Hydrocarbons)	2011/08/27	NC		%	40
		F4 (C34-C50 Hydrocarbons)	2011/08/27	NC		%	40

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: RCMP PRINCE ALBERT
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: CB179198

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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone(403) 291-3077 Fax(403) 291-9468

Validation Signature Page

Maxxam Job #: B179198

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

Janet Gao, Senior Analyst, Organics Department

LUBA SHYMUSHOVSKA, Senior Analyst, Organic Department

===

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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 A074341

Page: 1 of 1

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐	Report Distribution (E-Mail):	REGULATORY GUIDELINES:
Company:	EGE Engineering			☐ AT1
Contact:	Andrew Passalis			☐ CCME
Address:	511 Pepperloaf			☐ Regulated Drinking Water
	Prov: Winnipeg PC:	Prov: Jpalson emts.net		☐ Other:
Contact #s:	Ph: Cell:	Ph: Cell:		

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:	andrew.passalis@mts.net
Project # / Name:	RCMP Prince Albert
Site Location:	
Quote #:	
Sampled By:	

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 ☐VOCs	☐BTEX F1-F2 ☒BTEX F1-F4	☐ Routine Water ☐ Turb ☐ F	☐ TOC ☐ DOC	Regulated Metals (CCME / AT1) Total	Dissolved	Mercury ☐ Total ☐ Dissolved	Other Analysis	HOLD - Do not Analyze	# of Containers Submitted
1	PA-02		W	Aug 24 2011										X								5
2	TB-PA		W											X								5
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):	Date (YY/MM/DD):	Time (24:00):
JPalson.	11/08/24	
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions:	# of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: B179198		
School Report	11/08/24	16:00	Custody Seal	Temperature	Ice
Lab Comments: RECEIVED AUG 25 2011 0900			N	10.2, 10.0, 9.8	Y

AB FCD-00331 Rev3 2010/05

Maxxam Analytics International Corporation o/a Maxxam Analytics

Success Through Science®

Your Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Your C.O.C. #: A074130, A074131, A074132, A074135, A074136

Attention: ANDREW PASSALIS
EGE ENGINEERING LTD.
511 PEPPERLOAF CRESENT
WINNIPEG, MB
CANADA R3R 1E6

Report Date: 2011/08/15

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B171795
Received: 2011/08/05, 12:30

Sample Matrix: Soil
Samples Received: 32

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Boron (Hot Water Soluble)	4	2011/08/11	2011/08/11	AB SOP-00042	EPA 200.7
BTEX/F1 by HS GC/MS (MeOH extract)	19	2011/08/07	2011/08/09	CAL SOP-00190	CCME CWS, EPA 8260C
BTEX/F1 by HS GC/MS (MeOH extract)	1	2011/08/07	2011/08/10	CAL SOP-00190	CCME CWS, EPA 8260C
BTEX/F1 by HS GC/MS (MeOH extract)	1	2011/08/07	2011/08/11	CAL SOP-00190	CCME CWS, EPA 8260C
BTEX/F1 by HS GC/MS (MeOH extract)	3	2011/08/07	2011/08/12	CAL SOP-00190	CCME CWS, EPA 8260C
BTEX/F1 by HS GC/MS (MeOH extract)	3	2011/08/10	2011/08/11	CAL SOP-00190	CCME CWS, EPA 8260C
Hexavalent Chromium	4	2011/08/08	2011/08/08	CAL SOP-00056	SM 3500-Cr B
CCME Hydrocarbons (F2-F4 in soil)	7	2011/08/07	2011/08/11	AB SOP-00040 AB SOP-00036	CCME PHC-CWS
CCME Hydrocarbons (F2-F4 in soil)	20	2011/08/07	2011/08/12	AB SOP-00040 AB SOP-00036	CCME PHC-CWS
Glycol in Soil by GC/FID	4	2011/08/07	2011/08/10	CAL SOP-00093	EPA 8015 D
Elements by ICPMS - Soils	4	2011/08/11	2011/08/11	AB SOP-00043	EPA 200.8
Moisture	29	N/A	2011/08/08	CAL SOP-00023	McKeague MSSMA 2.411
Moisture	3	N/A	2011/08/11	CAL SOP-00023	McKeague MSSMA 2.411
Oil and Grease by IR	4	2011/08/08	2011/08/10	CAL SOP-00096	EPA 3550C, SM 5520C
Particle Size by Sieve (75 micron)	5	N/A	2011/08/11	AB SOP-00022	SSMA 55.4
Low Level VOCs in Soil by Direct Purge	2	2011/08/07	2011/08/10	CAL SOP-00104	EPA 8260 C
VOCs in Soil by P&T GC/MS (Std List)	4	2011/08/07	2011/08/10	CAL SOP-00104	EPA 8260 C

Encryption Key

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

Cynny Hagen, Project Manager
Email: CHagen@maxxam.ca
Phone# (403) 735-2239 Ext:2239

==

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Total cover pages: 1

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Maxxam Job #: B171795
Report Date: 2011/08/15

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters		Result	RDL	Units	meq/L	meq %	By	Batch
BE6450	PA-01/02-5							
Sampling Date	2011/08/02							
Matrix	SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL								
Physical Properties								
Moisture		13	0.3	%			KSA	5070032
PETROLEUM HYDROCARBONS (CCME)								
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)		9100	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)		<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)		<10	10	mg/kg			NK3	5077649
Reached Baseline at C50		YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)		87	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)								
Volatiles								
Benzene		0.43	0.0050	mg/kg			RSU	5069913
Toluene		8.2	0.020	mg/kg			RSU	5069913
Ethylbenzene		9.8	0.010	mg/kg			RSU	5069913
Xylenes (Total)		93	0.040	mg/kg			RSU	5069913
m & p-Xylene		59	0.040	mg/kg			RSU	5069913
o-Xylene		34	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX		2700 (1)	120	mg/kg			RSU	5069913
(C6-C10)		2800 (1)	120	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)		102	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)		232 (2)	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)		92	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)		89	60 - 140	%			RSU	5069913

(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Please note that the recovery of some compounds are outside control limits however the overall quality control for this analysis meets our acceptability criteria.

Sample Details/Parameters		Result	RDL	Units	meq/L	meq %	By	Batch
BE6451	PA-01/02-7							
Sampling Date	2011/08/02							
Matrix	SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL								
Physical Properties								
Moisture		25	0.3	%			KSA	5070032
PETROLEUM HYDROCARBONS (CCME)								
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)		<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)		28	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)		<10	10	mg/kg			NK3	5077649
Reached Baseline at C50		YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)		85	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)								
Volatiles								
Benzene		<0.0050	0.0050	mg/kg			RSU	5069913
Dup. Benzene		<0.0050	0.0050	mg/kg			RSU	5069913
Toluene		0.057	0.020	mg/kg			RSU	5069913
Dup. Toluene		0.045	0.020	mg/kg			RSU	5069913
Ethylbenzene		0.069	0.010	mg/kg			RSU	5069913
Dup. Ethylbenzene		0.046	0.010	mg/kg			RSU	5069913
Xylenes (Total)		0.66	0.040	mg/kg			RSU	5069913
Dup. Xylenes (Total)		0.44	0.040	mg/kg			RSU	5069913
m & p-Xylene		0.43	0.040	mg/kg			RSU	5069913
Dup. m & p-Xylene		0.28	0.040	mg/kg			RSU	5069913
o-Xylene		0.23	0.020	mg/kg			RSU	5069913
Dup. o-Xylene		0.16	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX		21	12	mg/kg			RSU	5069913

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EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6451 PA-01/02-7							
Sampling Date 2011/08/02							
Matrix SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Dup. F1 (C6-C10) - BTEX	13	12	mg/kg			RSU	5069913
(C6-C10)	22	12	mg/kg			RSU	5069913
Dup. (C6-C10)	13	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	99	60 - 140	%			RSU	5069913
Dup. 1,4-Difluorobenzene (sur.)	99	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	97	60 - 140	%			RSU	5069913
Dup. 4-BROMOFLUOROBENZENE (sur.)	98	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	79	30 - 130	%			RSU	5069913
Dup. D10-ETHYLBENZENE (sur.)	77	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	83	60 - 140	%			RSU	5069913
Dup. D4-1,2-DICHLOROETHANE (sur.)	82	60 - 140	%			RSU	5069913
BE6452 PA-01/02-12							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	25	0.3	%			KSA	5070032
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Dup. F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	76	10	mg/kg			NK3	5077649
Dup. F3 (C16-C34 Hydrocarbons)	55	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Dup. F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
Dup. Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	85	50 - 130	%			NK3	5077649
Dup. O-TERPHENYL (sur.)	85	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	100	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	96	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	82	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	83	60 - 140	%			RSU	5069913
BE6453 PA-03/04-5							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Elements							
Soluble (Hot water) Boron (B)	0.1	0.1	mg/kg			RL8	5085225
Hex. Chromium (Cr 6+)	<0.15	0.15	mg/kg			LS0	5071167

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EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6453 PA-03/04-5							
Sampling Date 2011/08/02							
Matrix SOIL							
ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)							
Elements							
Total Antimony (Sb)	<1	1	mg/kg			TDB	5084107
Total Arsenic (As)	3	1	mg/kg			TDB	5084107
Total Barium (Ba)	63	10	mg/kg			TDB	5084107
Total Beryllium (Be)	<0.4	0.4	mg/kg			TDB	5084107
Total Cadmium (Cd)	<0.1	0.1	mg/kg			TDB	5084107
Total Chromium (Cr)	6	1	mg/kg			TDB	5084107
Total Cobalt (Co)	4	1	mg/kg			TDB	5084107
Total Copper (Cu)	<5	5	mg/kg			TDB	5084107
Total Lead (Pb)	3	1	mg/kg			TDB	5084107
Total Mercury (Hg)	<0.05	0.05	mg/kg			TDB	5084107
Total Molybdenum (Mo)	<0.4	0.4	mg/kg			TDB	5084107
Total Nickel (Ni)	8	1	mg/kg			TDB	5084107
Total Selenium (Se)	<0.5	0.5	mg/kg			TDB	5084107
Total Silver (Ag)	<1	1	mg/kg			TDB	5084107
Total Thallium (Tl)	<0.3	0.3	mg/kg			TDB	5084107
Total Tin (Sn)	<1	1	mg/kg			TDB	5084107
Total Uranium (U)	<1	1	mg/kg			TDB	5084107
Total Vanadium (V)	10	1	mg/kg			TDB	5084107
Total Zinc (Zn)	17	10	mg/kg			TDB	5084107
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	15	0.3	%			KSA	5070032
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	10000	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	88	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Bromodichloromethane	<0.3	0.3	mg/kg			KD6	5072018
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Bromoform	<0.6	0.6	mg/kg			KD6	5072018
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Bromomethane	<0.2	0.2	mg/kg			KD6	5072018
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
Carbon tetrachloride	<0.2	0.2	mg/kg			KD6	5072018
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
Chlorobenzene	<0.2	0.2	mg/kg			KD6	5072018
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
Chlorodibromomethane	<0.2	0.2	mg/kg			KD6	5072018
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
Chloroethane	<0.2	0.2	mg/kg			KD6	5072018
(C6-C10)	<12	12	mg/kg			RSU	5069913
Chloroform	<0.2	0.2	mg/kg			KD6	5072018
Chloromethane	<0.3	0.3	mg/kg			KD6	5072018
1,2-dibromoethane	<0.2	0.2	mg/kg			KD6	5072018
1,2-dichlorobenzene	<0.2	0.2	mg/kg			KD6	5072018
1,3-dichlorobenzene	<0.2	0.2	mg/kg			KD6	5072018
1,4-dichlorobenzene	<0.2	0.2	mg/kg			KD6	5072018
1,1-dichloroethane	<0.2	0.2	mg/kg			KD6	5072018
1,2-dichloroethane	<0.2	0.2	mg/kg			KD6	5072018
1,1-dichloroethene	<0.2	0.2	mg/kg			KD6	5072018
cis-1,2-dichloroethene	<0.2	0.2	mg/kg			KD6	5072018

Maxxam

Maxxam Job #: B171795
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EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6453 PA-03/04-5							
Sampling Date 2011/08/02							
Matrix SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
trans-1,2-dichloroethene	<0.2	0.2	mg/kg			KD6	5072018
Dichloromethane	0.3	0.1	mg/kg			KD6	5072018
1,2-dichloropropane	<0.2	0.2	mg/kg			KD6	5072018
cis-1,3-dichloropropene	<0.2	0.2	mg/kg			KD6	5072018
trans-1,3-dichloropropene	<0.2	0.2	mg/kg			KD6	5072018
Methyl methacrylate	<0.4	0.4	mg/kg			KD6	5072018
Methyl-tert-butylether (MTBE)	<0.3	0.3	mg/kg			KD6	5072018
Styrene	<0.2	0.2	mg/kg			KD6	5072018
1,1,1,2-tetrachloroethane	<1	1	mg/kg			KD6	5072018
1,1,2,2-tetrachloroethane	<1	1	mg/kg			KD6	5072018
Tetrachloroethene	<0.2	0.2	mg/kg			KD6	5072018
1,2,3-trichlorobenzene	1.9	0.4	mg/kg			KD6	5072018
1,2,4-trichlorobenzene	1.0	0.4	mg/kg			KD6	5072018
1,3,5-trichlorobenzene	0.6	0.4	mg/kg			KD6	5072018
1,1,1-trichloroethane	<0.2	0.2	mg/kg			KD6	5072018
1,1,2-trichloroethane	<0.2	0.2	mg/kg			KD6	5072018
Trichloroethene	<0.1	0.1	mg/kg			KD6	5072018
Trichlorofluoromethane	<0.2	0.2	mg/kg			KD6	5072018
1,2,4-trimethylbenzene	170	6	mg/kg			KD6	5072018
1,3,5-trimethylbenzene	40	6	mg/kg			KD6	5072018
Vinyl chloride	<0.1	0.1	mg/kg			KD6	5072018
1,4-Difluorobenzene (sur.)	104	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	95	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	112	60 - 140	%			KD6	5072018
D10-ETHYLBENZENE (sur.)	110	30 - 130	%			KD6	5072018
D10-ETHYLBENZENE (sur.)	83	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	83	60 - 140	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	128	60 - 140	%			KD6	5072018
D8-TOLUENE (sur.)	105	60 - 140	%			KD6	5072018
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Misc. Organics							
Oil and grease	12000 (1)	500	mg/kg			RC8	5070278
GLYCOLS BY GC-FID (SOIL)							
Glycols							
Extractable (Water) Ethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Diethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Triethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Tetraethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Propylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Methyl Sulfone (sur.)	69	50 - 130	%			WP0	5070053

(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6454 PA-03/04-7							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	25	0.3	%			KSA	5070032
Dup. Moisture	21	0.3	%			KSA	5070032
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	95	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649

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Maxxam Job #: B171795
Report Date: 2011/08/15

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6454 PA-03/04-7							
Sampling Date 2011/08/02							
Matrix SOIL							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	86	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	101	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	96	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	79	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	84	60 - 140	%			RSU	5069913
BE6455 PA-03/04-14							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	18	0.3	%			KSA	5070032
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	90	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	101	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	97	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	86	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	83	60 - 140	%			RSU	5069913
BE6456 PA-05-5							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Sieve - Pan	7.4	0.2	%			YU	5077167
Sieve - #200 (>0.075mm)	93	0.2	%			YU	5077167
Grain Size	COARSE	0.2	%			YU	5077167
Moisture	18	0.3	%			KSA	5070032

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EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6456 PA-05-5							
Sampling Date 2011/08/02							
Matrix SOIL							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	7700	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	88	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	0.64	0.0050	mg/kg			RSU	5069913
Toluene	8.5	0.020	mg/kg			RSU	5069913
Ethylbenzene	8.8	0.010	mg/kg			RSU	5069913
Xylenes (Total)	83	0.040	mg/kg			RSU	5069913
m & p-Xylene	52	0.040	mg/kg			RSU	5069913
o-Xylene	31	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	2300 (1)	120	mg/kg			RSU	5069913
(C6-C10)	2400 (1)	120	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	104	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	194 (2)	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	88	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	89	60 - 140	%			RSU	5069913

(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Please note that the recovery of some compounds are outside control limits however the overall quality control for this analysis meets our acceptability criteria.

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6457 PA-05-8							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	24	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	180	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	17	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	86	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	0.042	0.020	mg/kg			RSU	5069913
Ethylbenzene	0.055	0.010	mg/kg			RSU	5069913
Xylenes (Total)	0.49	0.040	mg/kg			RSU	5069913
m & p-Xylene	0.32	0.040	mg/kg			RSU	5069913
o-Xylene	0.17	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	100	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	100	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	81	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	105	60 - 140	%			RSU	5069913

Maxxam Job #: B171795
Report Date: 2011/08/15

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6458 PA-06-5							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	14	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	92	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	98	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	99	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	84	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	83	60 - 140	%			RSU	5069913
BE6459 PA-07-5							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	15	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	3500	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	91	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	0.035	0.020	mg/kg			RSU	5069913
Ethylbenzene	0.046	0.010	mg/kg			RSU	5069913
Xylenes (Total)	0.42	0.040	mg/kg			RSU	5069913
m & p-Xylene	0.27	0.040	mg/kg			RSU	5069913
o-Xylene	0.15	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	16	12	mg/kg			RSU	5069913
(C6-C10)	16	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	102	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	97	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	79	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	83	60 - 140	%			RSU	5069913

Sample Details/Parameters		Result	RDL	Units	meq/L	meq %	By	Batch
BE6460	PA-07-7							
Sampling Date	2011/08/03							
Matrix	SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL								
Physical Properties								
Moisture		21	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)								
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)		<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)		<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)		<10	10	mg/kg			NK3	5077649
Reached Baseline at C50		YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)		89	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)								
Volatiles								
Benzene		<0.0050	0.0050	mg/kg			RSU	5069913
Toluene		<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene		<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)		<0.040	0.040	mg/kg			RSU	5069913
m & p-Xylene		<0.040	0.040	mg/kg			RSU	5069913
o-Xylene		<0.020	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX		<12	12	mg/kg			RSU	5069913
(C6-C10)		<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)		98	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)		99	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)		86	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)		83	60 - 140	%			RSU	5069913
BE6461	PA-08-5							
Sampling Date	2011/08/03							
Matrix	SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL								
Physical Properties								
Moisture		16	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)								
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)		2800	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)		<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)		<10	10	mg/kg			NK3	5077649
Reached Baseline at C50		YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)		91	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)								
Volatiles								
Benzene		0.034	0.0050	mg/kg			RSU	5069913
Toluene		0.22	0.020	mg/kg			RSU	5069913
Ethylbenzene		1.9	0.010	mg/kg			RSU	5069913
Xylenes (Total)		15	0.040	mg/kg			RSU	5069913
m & p-Xylene		11	0.040	mg/kg			RSU	5069913
o-Xylene		3.4	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX		760	12	mg/kg			RSU	5069913
(C6-C10)		780	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)		104	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)		121	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)		87	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)		85	60 - 140	%			RSU	5069913

Maxxam

Maxxam Job #: B171795
Report Date: 2011/08/15

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6462 PA-08-6							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	23	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	88	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	0.030	0.0050	mg/kg			RSU	5069913
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	98	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	98	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	83	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	81	60 - 140	%			RSU	5069913
BE6483 PA-09-5							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	25	0.3	%			KSA	5070032
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	100	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	87	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	102	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	96	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	82	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	83	60 - 140	%			RSU	5069913

Maxxam Job #: B171795
Report Date: 2011/08/15

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6484 PA-10-7							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	22	0.3	%			KSA	5070032
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	86	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	101	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	98	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	70	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	85	60 - 140	%			RSU	5069913
BE6485 PA-11-1							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Elements							
Soluble (Hot water) Boron (B)	0.2	0.1	mg/kg			RL8	5085225
Hex. Chromium (Cr 6+)	<0.15	0.15	mg/kg			LS0	5071167
ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)							
Elements							
Total Antimony (Sb)	<1	1	mg/kg			TDB	5084107
Total Arsenic (As)	5	1	mg/kg			TDB	5084107
Total Barium (Ba)	150	10	mg/kg			TDB	5084107
Total Beryllium (Be)	<0.4	0.4	mg/kg			TDB	5084107
Total Cadmium (Cd)	0.2	0.1	mg/kg			TDB	5084107
Total Chromium (Cr)	15	1	mg/kg			TDB	5084107
Total Cobalt (Co)	6	1	mg/kg			TDB	5084107
Total Copper (Cu)	9	5	mg/kg			TDB	5084107
Total Lead (Pb)	7	1	mg/kg			TDB	5084107
Total Mercury (Hg)	<0.05	0.05	mg/kg			TDB	5084107
Total Molybdenum (Mo)	0.4	0.4	mg/kg			TDB	5084107
Total Nickel (Ni)	18	1	mg/kg			TDB	5084107
Total Selenium (Se)	<0.5	0.5	mg/kg			TDB	5084107
Total Silver (Ag)	<1	1	mg/kg			TDB	5084107
Total Thallium (Tl)	<0.3	0.3	mg/kg			TDB	5084107
Total Tin (Sn)	<1	1	mg/kg			TDB	5084107
Total Uranium (U)	<1	1	mg/kg			TDB	5084107
Total Vanadium (V)	23	1	mg/kg			TDB	5084107
Total Zinc (Zn)	39	10	mg/kg			TDB	5084107
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	14	0.3	%			KSA	5070032

Maxxam Job #: B171795
Report Date: 2011/08/15

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6485 PA-11-1							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Misc. Organics							
Oil and grease	<50	50	mg/kg			RC8	5070278
GLYCOLS BY GC-FID (SOIL)							
Glycols							
Extractable (Water) Ethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Diethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Triethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Tetraethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Propylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Methyl Sulfone (sur.)	74	50 - 130	%			WP0	5070053
BE6486 PA-11-4							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	13	0.3	%			KSA	5070032
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	90	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Bromodichloromethane	<0.03	0.03	mg/kg			KD6	5072018
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Bromoform	<0.06	0.06	mg/kg			KD6	5072018
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Bromomethane	<0.02	0.02	mg/kg			KD6	5072018
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
Carbon tetrachloride	<0.0005	0.0005	mg/kg			KD6	5072031
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
Chlorobenzene	<0.001	0.001	mg/kg			KD6	5072031
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
Chlorodibromomethane	<0.02	0.02	mg/kg			KD6	5072018
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
Chloroethane	<0.02	0.02	mg/kg			KD6	5072018
(C6-C10)	<12	12	mg/kg			RSU	5069913
Chloroform	<0.0008	0.0008	mg/kg			KD6	5072031
Chloromethane	<0.03	0.03	mg/kg			KD6	5072018
1,2-dibromoethane	<0.002	0.002	mg/kg			KD6	5072031
1,2-dichlorobenzene	<0.02	0.02	mg/kg			KD6	5072018
1,3-dichlorobenzene	<0.02	0.02	mg/kg			KD6	5072018
1,4-dichlorobenzene	<0.02	0.02	mg/kg			KD6	5072018
1,1-dichloroethane	<0.02	0.02	mg/kg			KD6	5072018
1,2-dichloroethane	<0.002	0.002	mg/kg			KD6	5072031
1,1-dichloroethene	<0.02	0.02	mg/kg			KD6	5072018
cis-1,2-dichloroethene	<0.02	0.02	mg/kg			KD6	5072018
trans-1,2-dichloroethene	<0.02	0.02	mg/kg			KD6	5072018
Dichloromethane	0.04	0.01	mg/kg			KD6	5072018
1,2-dichloropropane	<0.02	0.02	mg/kg			KD6	5072018
cis-1,3-dichloropropene	<0.02	0.02	mg/kg			KD6	5072018
trans-1,3-dichloropropene	<0.02	0.02	mg/kg			KD6	5072018

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6486 PA-11-4							
Sampling Date 2011/08/02							
Matrix SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Methyl methacrylate	<0.04	0.04	mg/kg			KD6	5072018
Methyl-tert-butylether (MTBE)	<0.03	0.03	mg/kg			KD6	5072018
Styrene	<0.02	0.02	mg/kg			KD6	5072018
1,1,1,2-tetrachloroethane	<0.1	0.1	mg/kg			KD6	5072018
1,1,2,2-tetrachloroethane	<0.1	0.1	mg/kg			KD6	5072018
Tetrachloroethene	<0.02	0.02	mg/kg			KD6	5072018
1,2,3-trichlorobenzene	<0.04	0.04	mg/kg			KD6	5072018
1,2,4-trichlorobenzene	<0.04	0.04	mg/kg			KD6	5072018
1,3,5-trichlorobenzene	<0.04	0.04	mg/kg			KD6	5072018
1,1,1-trichloroethane	<0.02	0.02	mg/kg			KD6	5072018
1,1,2-trichloroethane	<0.02	0.02	mg/kg			KD6	5072018
Trichloroethene	<0.01	0.01	mg/kg			KD6	5072018
Trichlorofluoromethane	<0.02	0.02	mg/kg			KD6	5072018
1,2,4-trimethylbenzene	<0.6	0.6	mg/kg			KD6	5072018
1,3,5-trimethylbenzene	<0.6	0.6	mg/kg			KD6	5072018
Vinyl chloride	<0.0003	0.0003	mg/kg			KD6	5072031
1,4-Difluorobenzene (sur.)	103	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	95	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	80	60 - 140	%			KD6	5072031
4-BROMOFLUOROBENZENE (sur.)	102	60 - 140	%			KD6	5072018
D10-ETHYLBENZENE (sur.)	100	30 - 130	%			KD6	5072018
D10-ETHYLBENZENE (sur.)	65	30 - 130	%			KD6	5072031
D10-ETHYLBENZENE (sur.)	87	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	84	60 - 140	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	124	60 - 140	%			KD6	5072031
D4-1,2-DICHLOROETHANE (sur.)	124	60 - 140	%			KD6	5072018
D8-TOLUENE (sur.)	106	60 - 140	%			KD6	5072018
D8-TOLUENE (sur.)	111	60 - 140	%			KD6	5072031
BE6487 PA-12-4							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	12	0.3	%			KSA	5070032
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	89	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	97	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	100	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	104	30 - 130	%			RSU	5069913

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6487 PA-12-4							
Sampling Date 2011/08/02							
Matrix SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
D4-1,2-DICHLOROETHANE (sur.)	89	60 - 140	%			RSU	5069913
BE6488 PA-13-6							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	15	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	67	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	89	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)	0.072	0.040	mg/kg			RSU	5069913
m & p-Xylene	0.047	0.040	mg/kg			RSU	5069913
o-Xylene	0.025	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	94	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	102	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	97	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	80	60 - 140	%			RSU	5069913
BE6489 PA-14-4							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	17	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5077649
Reached Baseline at C50	YES		mg/kg			NK3	5077649
O-TERPHENYL (sur.)	88	50 - 130	%			NK3	5077649
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	102	60 - 140	%			RSU	5069913

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6489 PA-14-4							
Sampling Date 2011/08/03							
Matrix SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
4-BROMOFLUOROBENZENE (sur.)	95	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	86	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	78	60 - 140	%			RSU	5069913
BE6490 PA-15-1							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	19	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
Reached Baseline at C50	YES		mg/kg			NK3	5074307
O-TERPHENYL (sur.)	88	50 - 130	%			NK3	5074307
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5069913
Toluene	<0.020	0.020	mg/kg			RSU	5069913
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5069913
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5069913
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5069913
o-Xylene	<0.020	0.020	mg/kg			RSU	5069913
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5069913
(C6-C10)	<12	12	mg/kg			RSU	5069913
1,4-Difluorobenzene (sur.)	103	60 - 140	%			RSU	5069913
4-BROMOFLUOROBENZENE (sur.)	96	60 - 140	%			RSU	5069913
D10-ETHYLBENZENE (sur.)	85	30 - 130	%			RSU	5069913
D4-1,2-DICHLOROETHANE (sur.)	83	60 - 140	%			RSU	5069913
BE6491 PA-16-1							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	14	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
Reached Baseline at C50	YES		mg/kg			NK3	5074307
O-TERPHENYL (sur.)	86	50 - 130	%			NK3	5074307
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSA	5069928
Toluene	<0.020	0.020	mg/kg			RSA	5069928
Ethylbenzene	<0.010	0.010	mg/kg			RSA	5069928
Xylenes (Total)	<0.040	0.040	mg/kg			RSA	5069928
m & p-Xylene	<0.040	0.040	mg/kg			RSA	5069928
o-Xylene	<0.020	0.020	mg/kg			RSA	5069928
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSA	5069928

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6491 PA-16-1							
Sampling Date 2011/08/03							
Matrix SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
(C6-C10)	<12	12	mg/kg			RSA	5069928
1,4-Difluorobenzene (sur.)	100	60 - 140	%			RSA	5069928
4-BROMOFLUOROBENZENE (sur.)	102	60 - 140	%			RSA	5069928
D10-ETHYLBENZENE (sur.)	95	30 - 130	%			RSA	5069928
D4-1,2-DICHLOROETHANE (sur.)	102	60 - 140	%			RSA	5069928
BE6492 PA-17-4							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	19	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
Reached Baseline at C50	YES		mg/kg			NK3	5074307
O-TERPHENYL (sur.)	85	50 - 130	%			NK3	5074307
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSA	5069928
Toluene	<0.020	0.020	mg/kg			RSA	5069928
Ethylbenzene	<0.010	0.010	mg/kg			RSA	5069928
Xylenes (Total)	<0.040	0.040	mg/kg			RSA	5069928
m & p-Xylene	<0.040	0.040	mg/kg			RSA	5069928
o-Xylene	<0.020	0.020	mg/kg			RSA	5069928
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSA	5069928
(C6-C10)	<12	12	mg/kg			RSA	5069928
1,4-Difluorobenzene (sur.)	101	60 - 140	%			RSA	5069928
4-BROMOFLUOROBENZENE (sur.)	99	60 - 140	%			RSA	5069928
D10-ETHYLBENZENE (sur.)	92	30 - 130	%			RSA	5069928
D4-1,2-DICHLOROETHANE (sur.)	104	60 - 140	%			RSA	5069928
BE6493 BD1							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	17	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	2100	10	mg/kg			NK3	5074307
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
Reached Baseline at C50	YES		mg/kg			NK3	5074307
O-TERPHENYL (sur.)	87	50 - 130	%			NK3	5074307
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	0.058	0.0050	mg/kg			RSA	5069928
Toluene	0.27	0.020	mg/kg			RSA	5069928
Ethylbenzene	1.7	0.010	mg/kg			RSA	5069928
Xylenes (Total)	14	0.040	mg/kg			RSA	5069928
m & p-Xylene	11	0.040	mg/kg			RSA	5069928

Success Through Science®

Maxxam Job #: B171795
Report Date: 2011/08/15

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6493 BD1							
Sampling Date 2011/08/03							
Matrix SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
o-Xylene	3.3	0.020	mg/kg			RSA	5069928
F1 (C6-C10) - BTEX	640	12	mg/kg			RSA	5069928
(C6-C10)	660	12	mg/kg			RSA	5069928
1,4-Difluorobenzene (sur.)	97	60 - 140	%			RSA	5069928
4-BROMOFLUOROBENZENE (sur.)	117	60 - 140	%			RSA	5069928
D10-ETHYLBENZENE (sur.)	140 (1)	30 - 130	%			RSA	5069928
D4-1,2-DICHLOROETHANE (sur.)	102	60 - 140	%			RSA	5069928
(1) D10 Ethylbenzene recovery biased due to high level of native hydrocarbon present in sample.							
BE6494 BD2							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	23	0.3	%			KSA	5070091
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5074307
Reached Baseline at C50	YES		mg/kg			NK3	5074307
O-TERPHENYL (sur.)	86	50 - 130	%			NK3	5074307
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSA	5069928
Toluene	<0.020	0.020	mg/kg			RSA	5069928
Ethylbenzene	<0.010	0.010	mg/kg			RSA	5069928
Xylenes (Total)	<0.040	0.040	mg/kg			RSA	5069928
m & p-Xylene	<0.040	0.040	mg/kg			RSA	5069928
o-Xylene	<0.020	0.020	mg/kg			RSA	5069928
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSA	5069928
(C6-C10)	<12	12	mg/kg			RSA	5069928
1,4-Difluorobenzene (sur.)	101	60 - 140	%			RSA	5069928
4-BROMOFLUOROBENZENE (sur.)	99	60 - 140	%			RSA	5069928
D10-ETHYLBENZENE (sur.)	83	30 - 130	%			RSA	5069928
D4-1,2-DICHLOROETHANE (sur.)	103	60 - 140	%			RSA	5069928
BE6495 BD3							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Elements							
Soluble (Hot water) Boron (B)	<0.1	0.1	mg/kg			RL8	5085225
Hex. Chromium (Cr 6+)	<0.15	0.15	mg/kg			LS0	5071167
ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)							
Elements							
Total Antimony (Sb)	<1	1	mg/kg			TDB	5084107
Total Arsenic (As)	3	1	mg/kg			TDB	5084107
Total Barium (Ba)	54	10	mg/kg			TDB	5084107
Total Beryllium (Be)	<0.4	0.4	mg/kg			TDB	5084107
Total Cadmium (Cd)	<0.1	0.1	mg/kg			TDB	5084107
Total Chromium (Cr)	5	1	mg/kg			TDB	5084107
Total Cobalt (Co)	4	1	mg/kg			TDB	5084107

Sample Details/Parameters		Result	RDL	Units	meq/L	meq %	By	Batch
BE6495	BD3							
Sampling Date	2011/08/02							
Matrix	SOIL							
ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)								
Elements								
Total Copper (Cu)		<5	5	mg/kg			TDB	5084107
Total Lead (Pb)		3	1	mg/kg			TDB	5084107
Total Mercury (Hg)		<0.05	0.05	mg/kg			TDB	5084107
Total Molybdenum (Mo)		<0.4	0.4	mg/kg			TDB	5084107
Total Nickel (Ni)		8	1	mg/kg			TDB	5084107
Total Selenium (Se)		<0.5	0.5	mg/kg			TDB	5084107
Total Silver (Ag)		<1	1	mg/kg			TDB	5084107
Total Thallium (Tl)		<0.3	0.3	mg/kg			TDB	5084107
Total Tin (Sn)		<1	1	mg/kg			TDB	5084107
Total Uranium (U)		<1	1	mg/kg			TDB	5084107
Total Vanadium (V)		9	1	mg/kg			TDB	5084107
Total Zinc (Zn)		16	10	mg/kg			TDB	5084107
RESULTS OF CHEMICAL ANALYSES OF SOIL								
Physical Properties								
Moisture		15	0.3	%			KSA	5070091
VOLATILE ORGANICS BY GC-MS (SOIL)								
Volatiles								
Benzene		0.3	0.1	mg/kg			KD6	5072018
Bromodichloromethane		<0.7	0.7	mg/kg			KD6	5072018
Bromoform		<1	1	mg/kg			KD6	5072018
Bromomethane		<0.4	0.4	mg/kg			KD6	5072018
Carbon tetrachloride		<0.4	0.4	mg/kg			KD6	5072018
Chlorobenzene		<0.4	0.4	mg/kg			KD6	5072018
Chlorodibromomethane		<0.4	0.4	mg/kg			KD6	5072018
Chloroethane		<0.4	0.4	mg/kg			KD6	5072018
Chloroform		<0.4	0.4	mg/kg			KD6	5072018
Chloromethane		<0.7	0.7	mg/kg			KD6	5072018
1,2-dibromoethane		<0.4	0.4	mg/kg			KD6	5072018
1,2-dichlorobenzene		<0.4	0.4	mg/kg			KD6	5072018
1,3-dichlorobenzene		<0.4	0.4	mg/kg			KD6	5072018
1,4-dichlorobenzene		<0.4	0.4	mg/kg			KD6	5072018
1,1-dichloroethane		<0.4	0.4	mg/kg			KD6	5072018
1,2-dichloroethane		<0.4	0.4	mg/kg			KD6	5072018
1,1-dichloroethene		<0.4	0.4	mg/kg			KD6	5072018
cis-1,2-dichloroethene		<0.4	0.4	mg/kg			KD6	5072018
trans-1,2-dichloroethene		<0.4	0.4	mg/kg			KD6	5072018
Dichloromethane		<0.2	0.2	mg/kg			KD6	5072018
1,2-dichloropropane		<0.4	0.4	mg/kg			KD6	5072018
cis-1,3-dichloropropene		<0.4	0.4	mg/kg			KD6	5072018
trans-1,3-dichloropropene		<0.4	0.4	mg/kg			KD6	5072018
Ethylbenzene		11	0.2	mg/kg			KD6	5072018
Methyl methacrylate		<0.9	0.9	mg/kg			KD6	5072018
Methyl-tert-butylether (MTBE)		<0.7	0.7	mg/kg			KD6	5072018
Styrene		<0.4	0.4	mg/kg			KD6	5072018
1,1,1,2-tetrachloroethane		<2	2	mg/kg			KD6	5072018
1,1,2,2-tetrachloroethane		<2	2	mg/kg			KD6	5072018
Tetrachloroethene		<0.4	0.4	mg/kg			KD6	5072018
Toluene		7.9	0.4	mg/kg			KD6	5072018
1,2,3-trichlorobenzene		<0.9	0.9	mg/kg			KD6	5072018
1,2,4-trichlorobenzene		<0.9	0.9	mg/kg			KD6	5072018
1,3,5-trichlorobenzene		<0.9	0.9	mg/kg			KD6	5072018
1,1,1-trichloroethane		<0.4	0.4	mg/kg			KD6	5072018
1,1,2-trichloroethane		<0.4	0.4	mg/kg			KD6	5072018
Trichloroethene		<0.2	0.2	mg/kg			KD6	5072018
Trichlorofluoromethane		<0.4	0.4	mg/kg			KD6	5072018
1,2,4-trimethylbenzene		210	10	mg/kg			KD6	5072018

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6495 BD3							
Sampling Date 2011/08/02							
Matrix SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
1,3,5-trimethylbenzene	52	10	mg/kg			KD6	5072018
Vinyl chloride	<0.2	0.2	mg/kg			KD6	5072018
Xylenes (Total)	130	0.9	mg/kg			KD6	5072018
m & p-Xylene	82	0.9	mg/kg			KD6	5072018
o-Xylene	49	0.4	mg/kg			KD6	5072018
4-BROMOFLUOROBENZENE (sur.)	109	60 - 140	%			KD6	5072018
D10-ETHYLBENZENE (sur.)	106	30 - 130	%			KD6	5072018
D4-1,2-DICHLOROETHANE (sur.)	126	60 - 140	%			KD6	5072018
D8-TOLUENE (sur.)	105	60 - 140	%			KD6	5072018
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Misc. Organics							
Oil and grease	16000 (1)	500	mg/kg			RC8	5070278
GLYCOLS BY GC-FID (SOIL)							
Glycols							
Extractable (Water) Ethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Diethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Triethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Tetraethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Propylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Methyl Sulfone (sur.)	93	50 - 130	%			WP0	5070053
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.							
BE6496 PA-05-3							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Sieve - Pan	16	0.2	%			YU	5077167
Sieve - #200 (>0.075mm)	84	0.2	%			YU	5077167
Grain Size	COARSE	0.2	%			YU	5077167
Moisture	5.9	0.3	%			KSA	5070091
BE6497 PA-01/02-12							
Sampling Date 2011/08/02							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Sieve - Pan	95	0.2	%			YU	5077167
Sieve - #200 (>0.075mm)	4.8	0.2	%			YU	5077167
Grain Size	FINE	0.2	%			YU	5077167
Moisture	27	0.3	%			KSA	5070091
BE6498 PA-13-7							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Elements							
Soluble (Hot water) Boron (B)	0.1	0.1	mg/kg			RL8	5085225
Hex. Chromium (Cr 6+)	<0.15	0.15	mg/kg			LS0	5071167
Physical Properties							
Sieve - Pan	6.3	0.2	%			YU	5077167
Sieve - #200 (>0.075mm)	94	0.2	%			YU	5077167

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6498 PA-13-7							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Grain Size	COARSE	0.2	%			YU	5077167
ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)							
Elements							
Total Antimony (Sb)	<1	1	mg/kg			TDB	5084107
Total Arsenic (As)	3	1	mg/kg			TDB	5084107
Total Barium (Ba)	46	10	mg/kg			TDB	5084107
Total Beryllium (Be)	<0.4	0.4	mg/kg			TDB	5084107
Total Cadmium (Cd)	<0.1	0.1	mg/kg			TDB	5084107
Total Chromium (Cr)	5	1	mg/kg			TDB	5084107
Total Cobalt (Co)	4	1	mg/kg			TDB	5084107
Total Copper (Cu)	<5	5	mg/kg			TDB	5084107
Total Lead (Pb)	3	1	mg/kg			TDB	5084107
Total Mercury (Hg)	0.12	0.05	mg/kg			TDB	5084107
Total Molybdenum (Mo)	<0.4	0.4	mg/kg			TDB	5084107
Total Nickel (Ni)	8	1	mg/kg			TDB	5084107
Total Selenium (Se)	<0.5	0.5	mg/kg			TDB	5084107
Total Silver (Ag)	<1	1	mg/kg			TDB	5084107
Total Thallium (Tl)	<0.3	0.3	mg/kg			TDB	5084107
Total Tin (Sn)	<1	1	mg/kg			TDB	5084107
Total Uranium (U)	<1	1	mg/kg			TDB	5084107
Total Vanadium (V)	9	1	mg/kg			TDB	5084107
Total Zinc (Zn)	17	10	mg/kg			TDB	5084107
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	12	0.3	%			KSA	5070091
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.006	0.006	mg/kg			KD6	5072018
Bromodichloromethane	<0.03	0.03	mg/kg			KD6	5072018
Bromoform	<0.06	0.06	mg/kg			KD6	5072018
Bromomethane	<0.02	0.02	mg/kg			KD6	5072018
Carbon tetrachloride	<0.0005	0.0005	mg/kg			KD6	5072031
Chlorobenzene	<0.001	0.001	mg/kg			KD6	5072031
Chlorodibromomethane	<0.02	0.02	mg/kg			KD6	5072018
Chloroethane	<0.02	0.02	mg/kg			KD6	5072018
Chloroform	<0.0008	0.0008	mg/kg			KD6	5072031
Chloromethane	<0.03	0.03	mg/kg			KD6	5072018
1,2-dibromoethane	<0.002	0.002	mg/kg			KD6	5072031
1,2-dichlorobenzene	<0.02	0.02	mg/kg			KD6	5072018
1,3-dichlorobenzene	<0.02	0.02	mg/kg			KD6	5072018
1,4-dichlorobenzene	<0.02	0.02	mg/kg			KD6	5072018
1,1-dichloroethane	<0.02	0.02	mg/kg			KD6	5072018
1,2-dichloroethane	<0.002	0.002	mg/kg			KD6	5072031
1,1-dichloroethene	<0.02	0.02	mg/kg			KD6	5072018
cis-1,2-dichloroethene	<0.02	0.02	mg/kg			KD6	5072018
trans-1,2-dichloroethene	<0.02	0.02	mg/kg			KD6	5072018
Dichloromethane	<0.01	0.01	mg/kg			KD6	5072018
1,2-dichloropropane	<0.02	0.02	mg/kg			KD6	5072018
cis-1,3-dichloropropene	<0.02	0.02	mg/kg			KD6	5072018
trans-1,3-dichloropropene	<0.02	0.02	mg/kg			KD6	5072018
Ethylbenzene	<0.01	0.01	mg/kg			KD6	5072018
Methyl methacrylate	<0.04	0.04	mg/kg			KD6	5072018
Methyl-tert-butylether (MTBE)	<0.03	0.03	mg/kg			KD6	5072018
Styrene	<0.02	0.02	mg/kg			KD6	5072018
1,1,1,2-tetrachloroethane	<0.1	0.1	mg/kg			KD6	5072018
1,1,2,2-tetrachloroethane	<0.1	0.1	mg/kg			KD6	5072018

Maxxam

Maxxam Job #: B171795
Report Date: 2011/08/15

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6498 PA-13-7							
Sampling Date 2011/08/03							
Matrix SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Tetrachloroethene	<0.02	0.02	mg/kg			KD6	5072018
Toluene	<0.02	0.02	mg/kg			KD6	5072018
1,2,3-trichlorobenzene	<0.04	0.04	mg/kg			KD6	5072018
1,2,4-trichlorobenzene	<0.04	0.04	mg/kg			KD6	5072018
1,3,5-trichlorobenzene	<0.04	0.04	mg/kg			KD6	5072018
1,1,1-trichloroethane	<0.02	0.02	mg/kg			KD6	5072018
1,1,2-trichloroethane	<0.02	0.02	mg/kg			KD6	5072018
Trichloroethene	<0.01	0.01	mg/kg			KD6	5072018
Trichlorofluoromethane	<0.02	0.02	mg/kg			KD6	5072018
1,2,4-trimethylbenzene	<0.6	0.6	mg/kg			KD6	5072018
1,3,5-trimethylbenzene	<0.6	0.6	mg/kg			KD6	5072018
Vinyl chloride	<0.0003	0.0003	mg/kg			KD6	5072031
Xylenes (Total)	<0.04	0.04	mg/kg			KD6	5072018
m & p-Xylene	<0.04	0.04	mg/kg			KD6	5072018
o-Xylene	0.04	0.02	mg/kg			KD6	5072018
4-BROMOFLUOROBENZENE (sur.)	105	60 - 140	%			KD6	5072018
4-BROMOFLUOROBENZENE (sur.)	91	60 - 140	%			KD6	5072031
D10-ETHYLBENZENE (sur.)	82	30 - 130	%			KD6	5072031
D10-ETHYLBENZENE (sur.)	100	30 - 130	%			KD6	5072018
D4-1,2-DICHLOROETHANE (sur.)	126	60 - 140	%			KD6	5072018
D4-1,2-DICHLOROETHANE (sur.)	119	60 - 140	%			KD6	5072031
D8-TOLUENE (sur.)	127	60 - 140	%			KD6	5072031
D8-TOLUENE (sur.)	107	60 - 140	%			KD6	5072018
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Misc. Organics							
Oil and grease	<50	50	mg/kg			RC8	5070278
GLYCOLS BY GC-FID (SOIL)							
Glycols							
Extractable (Water) Ethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Diethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Triethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Tetraethylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Propylene Glycol	<10	10	mg/kg			WP0	5070053
Extractable (Water) Methyl Sulfone (sur.)	86	50 - 130	%			WP0	5070053
BE6509 PA-09-8							
Sampling Date 2011/08/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Sieve - Pan	99	0.2	%			YU	5077167
Sieve - #200 (>0.075mm)	1.4	0.2	%			YU	5077167
Grain Size	FINE	0.2	%			YU	5077167
Moisture	25	0.3	%			KSA	5081536
Dup. Moisture	24	0.3	%			KSA	5081536
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			JW0	5086319
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			JW0	5086319
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			JW0	5086319
Reached Baseline at C50	YES		mg/kg			JW0	5086319
O-TERPHENYL (sur.)	83	50 - 130	%			JW0	5086319
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			PX	5081485

Maxxam Job #: B171795
Report Date: 2011/08/15

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters		Result	RDL	Units	meq/L	meq %	By	Batch
BE6509	PA-09-8							
Sampling Date	2011/08/03							
Matrix	SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)								
Volatiles								
Toluene		<0.020	0.020	mg/kg			PX	5081485
Ethylbenzene		<0.010	0.010	mg/kg			PX	5081485
Xylenes (Total)		<0.040	0.040	mg/kg			PX	5081485
m & p-Xylene		<0.040	0.040	mg/kg			PX	5081485
o-Xylene		<0.020	0.020	mg/kg			PX	5081485
F1 (C6-C10) - BTEX		<12	12	mg/kg			PX	5081485
(C6-C10)		<12	12	mg/kg			PX	5081485
1,4-Difluorobenzene (sur.)		104	60 - 140	%			PX	5081485
4-BROMOFLUOROBENZENE (sur.)		100	60 - 140	%			PX	5081485
D10-ETHYLBENZENE (sur.)		82	30 - 130	%			PX	5081485
D4-1,2-DICHLOROETHANE (sur.)		94	60 - 140	%			PX	5081485
BE6510	PA-10-4							
Sampling Date	2011/08/03							
Matrix	SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL								
Physical Properties								
Moisture		16	0.3	%			KSA	5081553
PETROLEUM HYDROCARBONS (CCME)								
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)		<10	10	mg/kg			JW0	5086319
F3 (C16-C34 Hydrocarbons)		<10	10	mg/kg			JW0	5086319
F4 (C34-C50 Hydrocarbons)		<10	10	mg/kg			JW0	5086319
Reached Baseline at C50		YES		mg/kg			JW0	5086319
O-TERPHENYL (sur.)		79	50 - 130	%			JW0	5086319
VOLATILE ORGANICS BY GC-MS (SOIL)								
Volatiles								
Benzene		<0.0050	0.0050	mg/kg			PX	5081485
Toluene		<0.020	0.020	mg/kg			PX	5081485
Ethylbenzene		<0.010	0.010	mg/kg			PX	5081485
Xylenes (Total)		<0.040	0.040	mg/kg			PX	5081485
m & p-Xylene		<0.040	0.040	mg/kg			PX	5081485
o-Xylene		<0.020	0.020	mg/kg			PX	5081485
F1 (C6-C10) - BTEX		<12	12	mg/kg			PX	5081485
(C6-C10)		<12	12	mg/kg			PX	5081485
1,4-Difluorobenzene (sur.)		108	60 - 140	%			PX	5081485
4-BROMOFLUOROBENZENE (sur.)		104	60 - 140	%			PX	5081485
D10-ETHYLBENZENE (sur.)		81	30 - 130	%			PX	5081485
D4-1,2-DICHLOROETHANE (sur.)		96	60 - 140	%			PX	5081485
BE6518	PA-13-8							
Sampling Date	2011/08/03							
Matrix	SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL								
Physical Properties								
Moisture		13	0.3	%			KSA	5081553
PETROLEUM HYDROCARBONS (CCME)								
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)		86	10	mg/kg			JW0	5086319
F3 (C16-C34 Hydrocarbons)		<10	10	mg/kg			JW0	5086319
F4 (C34-C50 Hydrocarbons)		<10	10	mg/kg			JW0	5086319
Reached Baseline at C50		YES		mg/kg			JW0	5086319
O-TERPHENYL (sur.)		81	50 - 130	%			JW0	5086319

Maxxam Job #: B171795
Report Date: 2011/08/15

EGE ENGINEERING LTD.
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
Site Location: 190 AIRPORT ROAD
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BE6518 PA-13-8							
Sampling Date 2011/08/03							
Matrix SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			PX	5081485
Toluene	<0.020	0.020	mg/kg			PX	5081485
Ethylbenzene	<0.010	0.010	mg/kg			PX	5081485
Xylenes (Total)	0.14	0.040	mg/kg			PX	5081485
m & p-Xylene	0.042	0.040	mg/kg			PX	5081485
o-Xylene	0.096	0.020	mg/kg			PX	5081485
F1 (C6-C10) - BTEX	28	12	mg/kg			PX	5081485
(C6-C10)	28	12	mg/kg			PX	5081485
1,4-Difluorobenzene (sur.)	101	60 - 140	%			PX	5081485
4-BROMOFLUOROBENZENE (sur.)	110	60 - 140	%			PX	5081485
D10-ETHYLBENZENE (sur.)	81	30 - 130	%			PX	5081485
D4-1,2-DICHLOROETHANE (sur.)	91	60 - 140	%			PX	5081485

Package 1	8.0°C
Package 2	11.0°C
Package 3	8.7°C
Package 4	7.7°C

Each temperature is the average of up to three cooler temperatures taken at receipt

VOLATILE ORGANICS BY GC-MS (SOIL) Comments

Sample BE6453-01 VOCs in Soil by P&T GC/MS (Std List): Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.Sample could not be analyzed by low level method due to high levels of hydrocarbons.

Sample BE6495-01 VOCs in Soil by P&T GC/MS (Std List): Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.Sample could not be analyzed by low level method due to high levels of hydrocarbons.

Meq % is based on dissolved calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulphate and chloride

Results relate only to the items tested.

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
P.O. #:
Site Location: 190 AIRPORT ROAD

Quality Assurance Report

Maxxam Job Number: CB171795

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5069913 RSU	Matrix Spike						
	[BE6451-01]	1,4-Difluorobenzene (sur.)	2011/08/09		99	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/08/09		98	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/09		84	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/09		87	%	60 - 140
		Benzene	2011/08/09		94	%	60 - 140
		Toluene	2011/08/09		99	%	60 - 140
		Ethylbenzene	2011/08/09		105	%	60 - 140
		m & p-Xylene	2011/08/09		107	%	60 - 140
		o-Xylene	2011/08/09		107	%	60 - 140
		(C6-C10)	2011/08/09		70	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene (sur.)	2011/08/09		100	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/08/09		96	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/09		104	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/09		89	%	60 - 140
		Benzene	2011/08/09		102	%	60 - 140
		Toluene	2011/08/09		106	%	60 - 140
		Ethylbenzene	2011/08/09		111	%	60 - 140
		m & p-Xylene	2011/08/09		113	%	60 - 140
		o-Xylene	2011/08/09		114	%	60 - 140
		(C6-C10)	2011/08/09		61	%	60 - 140
	Method Blank	1,4-Difluorobenzene (sur.)	2011/08/09		99	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/08/09		98	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/09		94	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/09		83	%	60 - 140
		Benzene	2011/08/09	<0.0050		mg/kg	
		Toluene	2011/08/09	<0.020		mg/kg	
		Ethylbenzene	2011/08/09	<0.010		mg/kg	
		Xylenes (Total)	2011/08/09	<0.040		mg/kg	
		m & p-Xylene	2011/08/09	<0.040		mg/kg	
		o-Xylene	2011/08/09	<0.020		mg/kg	
		F1 (C6-C10) - BTEX	2011/08/09	<12		mg/kg	
		(C6-C10)	2011/08/09	<12		mg/kg	
	RPD [BE6451-01]	Benzene	2011/08/09	NC		%	50
		Toluene	2011/08/09	NC		%	50
		Ethylbenzene	2011/08/09	NC		%	50
		Xylenes (Total)	2011/08/09	41.6		%	50
		m & p-Xylene	2011/08/09	43.3		%	50
		o-Xylene	2011/08/09	38.5		%	50
		F1 (C6-C10) - BTEX	2011/08/09	NC		%	50
		(C6-C10)	2011/08/09	NC		%	50
5069928 RSA	Matrix Spike	1,4-Difluorobenzene (sur.)	2011/08/10		96	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/08/10		97	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/10		96	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/10		101	%	60 - 140
		Benzene	2011/08/10		137	%	60 - 140
		Toluene	2011/08/10		100	%	60 - 140
		Ethylbenzene	2011/08/10		109	%	60 - 140
		m & p-Xylene	2011/08/10		111	%	60 - 140
		o-Xylene	2011/08/10		120	%	60 - 140
		(C6-C10)	2011/08/10		92	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene (sur.)	2011/08/10		98	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/08/10		99	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/10		97	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/10		106	%	60 - 140

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
P.O. #:
Site Location: 190 AIRPORT ROAD

Quality Assurance Report (Continued)

Maxxam Job Number: CB171795

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5069928 RSA	Spiked Blank	Benzene	2011/08/10		92	%	60 - 140
		Toluene	2011/08/10		94	%	60 - 140
		Ethylbenzene	2011/08/10		101	%	60 - 140
		m & p-Xylene	2011/08/10		102	%	60 - 140
		o-Xylene	2011/08/10		107	%	60 - 140
		(C6-C10)	2011/08/10		68	%	60 - 140
	Method Blank	1,4-Difluorobenzene (sur.)	2011/08/10		97	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/08/10		99	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/10		96	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/10		114	%	60 - 140
		Benzene	2011/08/10	<0.0050		mg/kg	
		Toluene	2011/08/10	<0.020		mg/kg	
		Ethylbenzene	2011/08/10	<0.010		mg/kg	
		Xylenes (Total)	2011/08/10	<0.040		mg/kg	
		m & p-Xylene	2011/08/10	<0.040		mg/kg	
		o-Xylene	2011/08/10	<0.020		mg/kg	
		F1 (C6-C10) - BTEX	2011/08/10	<12		mg/kg	
		(C6-C10)	2011/08/10	<12		mg/kg	
	RPD	Benzene	2011/08/10	8.5		%	50
		Toluene	2011/08/10	NC		%	50
		Ethylbenzene	2011/08/10	NC		%	50
		Xylenes (Total)	2011/08/10	NC		%	50
		m & p-Xylene	2011/08/10	NC		%	50
		o-Xylene	2011/08/10	NC		%	50
		F1 (C6-C10) - BTEX	2011/08/10	NC		%	50
		(C6-C10)	2011/08/10	NC		%	50
5070032 KSA	RPD [BE6454-01]	Moisture	2011/08/08	18.6		%	20
5070053 WP0	Matrix Spike	Extractable (Water) Methyl Sulfone (sur.)	2011/08/10		74	%	50 - 130
		Extractable (Water) Ethylene Glycol	2011/08/10		84	%	30 - 130
		Extractable (Water) Diethylene Glycol	2011/08/10		81	%	30 - 130
		Extractable (Water) Triethylene Glycol	2011/08/10		85	%	30 - 130
		Extractable (Water) Tetraethylene Glycol	2011/08/10		89	%	30 - 130
		Extractable (Water) Propylene Glycol	2011/08/10		82	%	30 - 130
	Spiked Blank	Extractable (Water) Methyl Sulfone (sur.)	2011/08/10		80	%	50 - 130
		Extractable (Water) Ethylene Glycol	2011/08/10		85	%	30 - 130
		Extractable (Water) Diethylene Glycol	2011/08/10		80	%	30 - 130
		Extractable (Water) Triethylene Glycol	2011/08/10		86	%	30 - 130
		Extractable (Water) Tetraethylene Glycol	2011/08/10		94	%	30 - 130
		Extractable (Water) Propylene Glycol	2011/08/10		81	%	30 - 130
	Method Blank	Extractable (Water) Methyl Sulfone (sur.)	2011/08/10		102	%	50 - 130
		Extractable (Water) Ethylene Glycol	2011/08/10	<10		mg/kg	
		Extractable (Water) Diethylene Glycol	2011/08/10	<10		mg/kg	
		Extractable (Water) Triethylene Glycol	2011/08/10	<10		mg/kg	
		Extractable (Water) Tetraethylene Glycol	2011/08/10	<10		mg/kg	
		Extractable (Water) Propylene Glycol	2011/08/10	<10		mg/kg	
	RPD	Extractable (Water) Ethylene Glycol	2011/08/10	NC		%	50
		Extractable (Water) Diethylene Glycol	2011/08/10	NC		%	50
		Extractable (Water) Triethylene Glycol	2011/08/10	NC		%	50
		Extractable (Water) Tetraethylene Glycol	2011/08/10	NC		%	50
		Extractable (Water) Propylene Glycol	2011/08/10	NC		%	50
5070091 KSA	RPD	Moisture	2011/08/08	11.1		%	20
5070278 RC8	Matrix Spike	Oil and grease	2011/08/10		NC	%	30 - 130
	QC Standard	Oil and grease	2011/08/10		86	%	40 - 160
	Spiked Blank	Oil and grease	2011/08/10		101	%	70 - 130
	Method Blank	Oil and grease	2011/08/10	<50		mg/kg	

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
P.O. #:
Site Location: 190 AIRPORT ROAD

Quality Assurance Report (Continued)

Maxxam Job Number: CB171795

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5070278 RC8	RPD	Oil and grease	2011/08/10	8.0		%	50
5071167 LS0	Matrix Spike	Hex. Chromium (Cr 6+)	2011/08/08		92	%	75 - 125
	Spiked Blank	Hex. Chromium (Cr 6+)	2011/08/08		98	%	90 - 110
	Method Blank	Hex. Chromium (Cr 6+)	2011/08/08	<0.15		mg/kg	
	RPD	Hex. Chromium (Cr 6+)	2011/08/08	NC		%	35
5072018 KD6	Matrix Spike	4-BROMOFLUOROBENZENE (sur.)	2011/08/10		108	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/10		100	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/10		123	%	60 - 140
		D8-TOLUENE (sur.)	2011/08/10		109	%	60 - 140
		Benzene	2011/08/10		92	%	60 - 140
		Bromodichloromethane	2011/08/10		92	%	60 - 140
		Bromoform	2011/08/10		65	%	60 - 140
		Bromomethane	2011/08/10		79	%	60 - 140
		Carbon tetrachloride	2011/08/10		88	%	60 - 140
		Chlorobenzene	2011/08/10		87	%	60 - 140
		Chlorodibromomethane	2011/08/10		79	%	60 - 140
		Chloroethane	2011/08/10		107	%	60 - 140
		Chloroform	2011/08/10		92	%	60 - 140
		Chloromethane	2011/08/10		99	%	60 - 140
		1,2-dibromoethane	2011/08/10		86	%	60 - 140
		1,2-dichlorobenzene	2011/08/10		81	%	60 - 140
		1,3-dichlorobenzene	2011/08/10		82	%	60 - 140
		1,4-dichlorobenzene	2011/08/10		82	%	60 - 140
		1,1-dichloroethane	2011/08/10		110	%	60 - 140
		1,2-dichloroethane	2011/08/10		106	%	60 - 140
		1,1-dichloroethene	2011/08/10		109	%	60 - 140
		cis-1,2-dichloroethene	2011/08/10		84	%	60 - 140
		trans-1,2-dichloroethene	2011/08/10		112	%	60 - 140
		Dichloromethane	2011/08/10		105	%	60 - 140
		1,2-dichloropropane	2011/08/10		85	%	60 - 140
		cis-1,3-dichloropropene	2011/08/10		85	%	60 - 140
		trans-1,3-dichloropropene	2011/08/10		78	%	60 - 140
		Ethylbenzene	2011/08/10		88	%	60 - 140
		Methyl methacrylate	2011/08/10		85	%	60 - 140
		Methyl-tert-butylether (MTBE)	2011/08/10		91	%	60 - 140
		Styrene	2011/08/10		89	%	60 - 140
		1,1,1,2-tetrachloroethane	2011/08/10		79	%	60 - 140
		1,1,2,2-tetrachloroethane	2011/08/10		86	%	60 - 140
		Tetrachloroethene	2011/08/10		81	%	60 - 140
		Toluene	2011/08/10		90	%	60 - 140
		1,3,5-trichlorobenzene	2011/08/10		62	%	60 - 140
		1,1,1-trichloroethane	2011/08/10		92	%	60 - 140
		1,1,2-trichloroethane	2011/08/10		83	%	60 - 140
		Trichloroethene	2011/08/10		85	%	60 - 140
		Trichlorofluoromethane	2011/08/10		108	%	60 - 140
		1,2,4-trimethylbenzene	2011/08/10		90	%	60 - 140
		1,3,5-trimethylbenzene	2011/08/10		71	%	60 - 140
		Vinyl chloride	2011/08/10		119	%	60 - 140
		m & p-Xylene	2011/08/10		92	%	60 - 140
		o-Xylene	2011/08/10		90	%	60 - 140
	Spiked Blank	4-BROMOFLUOROBENZENE (sur.)	2011/08/10		108	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/10		100	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/10		124	%	60 - 140
		D8-TOLUENE (sur.)	2011/08/10		109	%	60 - 140
		Benzene	2011/08/10		92	%	60 - 140

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Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
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Quality Assurance Report (Continued)

Maxxam Job Number: CB171795

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5072018 KD6	Spiked Blank	Bromodichloromethane	2011/08/10		98	%	60 - 140
		Bromoform	2011/08/10		70	%	60 - 140
		Bromomethane	2011/08/10		44 (1)	%	60 - 140
		Carbon tetrachloride	2011/08/10		89	%	60 - 140
		Chlorobenzene	2011/08/10		87	%	60 - 140
		Chlorodibromomethane	2011/08/10		86	%	60 - 140
		Chloroethane	2011/08/10		96	%	60 - 140
		Chloroform	2011/08/10		95	%	60 - 140
		Chloromethane	2011/08/10		102	%	60 - 140
		1,2-dibromoethane	2011/08/10		91	%	60 - 140
		1,2-dichlorobenzene	2011/08/10		86	%	60 - 140
		1,3-dichlorobenzene	2011/08/10		85	%	60 - 140
		1,4-dichlorobenzene	2011/08/10		83	%	60 - 140
		1,1-dichloroethane	2011/08/10		101	%	60 - 140
		1,2-dichloroethane	2011/08/10		110	%	60 - 140
		1,1-dichloroethene	2011/08/10		109	%	60 - 140
		cis-1,2-dichloroethene	2011/08/10		86	%	60 - 140
		trans-1,2-dichloroethene	2011/08/10		113	%	60 - 140
		Dichloromethane	2011/08/10		105	%	60 - 140
		1,2-dichloropropane	2011/08/10		88	%	60 - 140
		cis-1,3-dichloropropene	2011/08/10		84	%	60 - 140
		trans-1,3-dichloropropene	2011/08/10		78	%	60 - 140
		Ethylbenzene	2011/08/10		86	%	60 - 140
		Methyl methacrylate	2011/08/10		91	%	60 - 140
		Methyl-tert-butylether (MTBE)	2011/08/10		97	%	60 - 140
		Styrene	2011/08/10		90	%	60 - 140
		1,1,1,2-tetrachloroethane	2011/08/10		81	%	60 - 140
		1,1,2,2-tetrachloroethane	2011/08/10		91	%	60 - 140
		Tetrachloroethene	2011/08/10		78	%	60 - 140
		Toluene	2011/08/10		91	%	60 - 140
		1,2,3-trichlorobenzene	2011/08/10		75	%	60 - 140
		1,2,4-trichlorobenzene	2011/08/10		82	%	60 - 140
		1,3,5-trichlorobenzene	2011/08/10		68	%	60 - 140
		1,1,1-trichloroethane	2011/08/10		94	%	60 - 140
		1,1,2-trichloroethane	2011/08/10		88	%	60 - 140
		Trichloroethene	2011/08/10		84	%	60 - 140
		Trichlorofluoromethane	2011/08/10		105	%	60 - 140
		1,2,4-trimethylbenzene	2011/08/10		90	%	60 - 140
		1,3,5-trimethylbenzene	2011/08/10		70	%	60 - 140
		Vinyl chloride	2011/08/10		118	%	60 - 140
		m & p-Xylene	2011/08/10		90	%	60 - 140
		o-Xylene	2011/08/10		90	%	60 - 140
	Method Blank	4-BROMOFLUOROBENZENE (sur.)	2011/08/08		99	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/08		105	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/08		114	%	60 - 140
		D8-TOLUENE (sur.)	2011/08/08		102	%	60 - 140
		Benzene	2011/08/08	<0.006		mg/kg	
		Bromodichloromethane	2011/08/08	<0.03		mg/kg	
		Bromoform	2011/08/08	<0.06		mg/kg	
		Bromomethane	2011/08/08	<0.02		mg/kg	
		Carbon tetrachloride	2011/08/08	<0.02		mg/kg	
		Chlorobenzene	2011/08/08	<0.02		mg/kg	
		Chlorodibromomethane	2011/08/08	<0.02		mg/kg	
		Chloroethane	2011/08/08	<0.02		mg/kg	
		Chloroform	2011/08/08	0.04, RDL=0.02		mg/kg	

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Quality Assurance Report (Continued)

Maxxam Job Number: CB171795

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5072018 KD6	Method Blank	Chloromethane	2011/08/08	<0.03		mg/kg	
		1,2-dibromoethane	2011/08/08	<0.02		mg/kg	
		1,2-dichlorobenzene	2011/08/08	<0.02		mg/kg	
		1,3-dichlorobenzene	2011/08/08	<0.02		mg/kg	
		1,4-dichlorobenzene	2011/08/08	<0.02		mg/kg	
		1,1-dichloroethane	2011/08/08	<0.02		mg/kg	
		1,2-dichloroethane	2011/08/08	<0.02		mg/kg	
		1,1-dichloroethene	2011/08/08	<0.02		mg/kg	
		cis-1,2-dichloroethene	2011/08/08	<0.02		mg/kg	
		trans-1,2-dichloroethene	2011/08/08	<0.02		mg/kg	
		Dichloromethane	2011/08/08	<0.01		mg/kg	
		1,2-dichloropropane	2011/08/08	<0.02		mg/kg	
		cis-1,3-dichloropropene	2011/08/08	<0.02		mg/kg	
		trans-1,3-dichloropropene	2011/08/08	<0.02		mg/kg	
		Ethylbenzene	2011/08/08	<0.01		mg/kg	
		Methyl methacrylate	2011/08/08	<0.04		mg/kg	
		Methyl-tert-butylether (MTBE)	2011/08/08	<0.03		mg/kg	
		Styrene	2011/08/08	<0.02		mg/kg	
		1,1,1,2-tetrachloroethane	2011/08/08	<0.1		mg/kg	
		1,1,2,2-tetrachloroethane	2011/08/08	<0.1		mg/kg	
		Tetrachloroethene	2011/08/08	<0.02		mg/kg	
		Toluene	2011/08/08	<0.02		mg/kg	
		1,2,3-trichlorobenzene	2011/08/08	<0.04		mg/kg	
		1,2,4-trichlorobenzene	2011/08/08	<0.04		mg/kg	
		1,3,5-trichlorobenzene	2011/08/08	<0.04		mg/kg	
		1,1,1-trichloroethane	2011/08/08	<0.02		mg/kg	
		1,1,2-trichloroethane	2011/08/08	<0.02		mg/kg	
		Trichloroethene	2011/08/08	<0.01		mg/kg	
		Trichlorofluoromethane	2011/08/08	<0.02		mg/kg	
		1,2,4-trimethylbenzene	2011/08/08	<0.6		mg/kg	
		1,3,5-trimethylbenzene	2011/08/08	<0.6		mg/kg	
		Vinyl chloride	2011/08/08	<0.01		mg/kg	
		Xylenes (Total)	2011/08/08	<0.04		mg/kg	
		m & p-Xylene	2011/08/08	<0.04		mg/kg	
		o-Xylene	2011/08/08	<0.02		mg/kg	
	RPD	Bromodichloromethane	2011/08/09	NC		%	50
		Bromoform	2011/08/09	NC		%	50
		Bromomethane	2011/08/09	NC		%	50
		Chlorodibromomethane	2011/08/09	NC		%	50
		Chloroethane	2011/08/09	NC		%	50
		Chloroform	2011/08/09	NC		%	50
		Chloromethane	2011/08/09	NC		%	50
		1,2-dichlorobenzene	2011/08/09	NC		%	50
		1,3-dichlorobenzene	2011/08/09	NC		%	50
		1,4-dichlorobenzene	2011/08/09	NC		%	50
		1,1-dichloroethane	2011/08/09	NC		%	50
		1,1-dichloroethene	2011/08/09	NC		%	50
		cis-1,2-dichloroethene	2011/08/09	NC		%	50
		trans-1,2-dichloroethene	2011/08/09	NC		%	50
		Dichloromethane	2011/08/09	NC		%	50
		1,2-dichloropropane	2011/08/09	NC		%	50
		cis-1,3-dichloropropene	2011/08/09	NC		%	50
		trans-1,3-dichloropropene	2011/08/09	NC		%	50
		Methyl methacrylate	2011/08/09	NC		%	50
		Methyl-tert-butylether (MTBE)	2011/08/09	NC		%	50

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Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
P.O. #:
Site Location: 190 AIRPORT ROAD

Quality Assurance Report (Continued)

Maxxam Job Number: CB171795

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5072018 KD6	RPD	Styrene	2011/08/09	NC		%	50
		1,1,1,2-tetrachloroethane	2011/08/09	NC		%	50
		1,1,2,2-tetrachloroethane	2011/08/09	NC		%	50
		Tetrachloroethene	2011/08/09	NC		%	50
		1,2,3-trichlorobenzene	2011/08/09	NC		%	50
		1,2,4-trichlorobenzene	2011/08/09	NC		%	50
		1,3,5-trichlorobenzene	2011/08/09	NC		%	50
		1,1,1-trichloroethane	2011/08/09	NC		%	50
		1,1,2-trichloroethane	2011/08/09	NC		%	50
		Trichloroethene	2011/08/09	NC		%	50
		Trichlorofluoromethane	2011/08/09	NC		%	50
		1,2,4-trimethylbenzene	2011/08/09	NC		%	50
		1,3,5-trimethylbenzene	2011/08/09	NC		%	50
5072031 KD6	Matrix Spike	4-BROMOFLUOROBENZENE (sur.)	2011/08/09		89	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/09		70	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/09		115	%	60 - 140
		D8-TOLUENE (sur.)	2011/08/09		116	%	60 - 140
		Carbon tetrachloride	2011/08/09		94	%	60 - 140
		Chlorobenzene	2011/08/09		72	%	60 - 140
		Chloroform	2011/08/09		84	%	60 - 140
		1,2-dibromoethane	2011/08/09		111	%	60 - 140
		1,2-dichloroethane	2011/08/09		87	%	60 - 140
		Vinyl chloride	2011/08/09		77	%	60 - 140
	Spiked Blank	4-BROMOFLUOROBENZENE (sur.)	2011/08/09		92	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/09		94	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/09		111	%	60 - 140
		D8-TOLUENE (sur.)	2011/08/09		116	%	60 - 140
		Carbon tetrachloride	2011/08/09		96	%	60 - 140
		Chlorobenzene	2011/08/09		84	%	60 - 140
		Chloroform	2011/08/09		89	%	60 - 140
		1,2-dibromoethane	2011/08/09		121	%	60 - 140
		1,2-dichloroethane	2011/08/09		89	%	60 - 140
		Vinyl chloride	2011/08/09		81	%	60 - 140
	Method Blank	4-BROMOFLUOROBENZENE (sur.)	2011/08/09		87	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/09		126	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/09		115	%	60 - 140
		D8-TOLUENE (sur.)	2011/08/09		114	%	60 - 140
		Carbon tetrachloride	2011/08/09	<0.0005		mg/kg	
		Chlorobenzene	2011/08/09	<0.001		mg/kg	
		Chloroform	2011/08/09	<0.0008		mg/kg	
		1,2-dibromoethane	2011/08/09	<0.002		mg/kg	
		1,2-dichloroethane	2011/08/09	<0.002		mg/kg	
		Vinyl chloride	2011/08/09	<0.0003		mg/kg	
	RPD	Carbon tetrachloride	2011/08/09	NC		%	50
		Chlorobenzene	2011/08/09	NC		%	50
		1,2-dibromoethane	2011/08/09	NC		%	50
		1,2-dichloroethane	2011/08/09	NC		%	50
		Vinyl chloride	2011/08/09	NC		%	50
5074307 NK3	Matrix Spike	O-TERPHENYL (sur.)	2011/08/10		86	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/10		90	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2011/08/10		62	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2011/08/10		90	%	50 - 130
	Spiked Blank	O-TERPHENYL (sur.)	2011/08/10		83	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/10		101	%	70 - 130
		F3 (C16-C34 Hydrocarbons)	2011/08/10		81	%	70 - 130

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Attention: ANDREW PASSALIS
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P.O. #:
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Quality Assurance Report (Continued)

Maxxam Job Number: CB171795

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5074307 NK3	Spiked Blank	F4 (C34-C50 Hydrocarbons)	2011/08/10		85	%	70 - 130
	Method Blank	O-TERPHENYL (sur.)	2011/08/10		88	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/10	<10		mg/kg	
		F3 (C16-C34 Hydrocarbons)	2011/08/10	<10		mg/kg	
		F4 (C34-C50 Hydrocarbons)	2011/08/10	<10		mg/kg	
	RPD	F2 (C10-C16 Hydrocarbons)	2011/08/10	NC		%	50
		F3 (C16-C34 Hydrocarbons)	2011/08/10	NC		%	50
		F4 (C34-C50 Hydrocarbons)	2011/08/10	NC		%	50
5077167 YU	QC Standard	Sieve - Pan	2011/08/11		102	%	96 - 104
		Sieve - #200 (>0.075mm)	2011/08/11		95	%	90 - 110
	RPD	Sieve - Pan	2011/08/11	6.7		%	35
		Sieve - #200 (>0.075mm)	2011/08/11	0.5		%	35
5077649 NK3	Matrix Spike						
	[BE6452-01]	O-TERPHENYL (sur.)	2011/08/11		79	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/11		101	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2011/08/11		99	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2011/08/11		106	%	50 - 130
	Spiked Blank	O-TERPHENYL (sur.)	2011/08/11		84	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/11		103	%	70 - 130
		F3 (C16-C34 Hydrocarbons)	2011/08/11		92	%	70 - 130
		F4 (C34-C50 Hydrocarbons)	2011/08/11		100	%	70 - 130
	Method Blank	O-TERPHENYL (sur.)	2011/08/11		89	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/11	<10		mg/kg	
		F3 (C16-C34 Hydrocarbons)	2011/08/11	<10		mg/kg	
		F4 (C34-C50 Hydrocarbons)	2011/08/11	<10		mg/kg	
	RPD [BE6452-01]	F2 (C10-C16 Hydrocarbons)	2011/08/11	NC		%	50
		F3 (C16-C34 Hydrocarbons)	2011/08/11	32.6		%	50
		F4 (C34-C50 Hydrocarbons)	2011/08/11	NC		%	50
5081485 PX	Matrix Spike	1,4-Difluorobenzene (sur.)	2011/08/12		97	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/08/12		107	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/12		77	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/12		89	%	60 - 140
		Benzene	2011/08/12		93	%	60 - 140
		Toluene	2011/08/12		95	%	60 - 140
		Ethylbenzene	2011/08/12		104	%	60 - 140
		m & p-Xylene	2011/08/12		107	%	60 - 140
		o-Xylene	2011/08/12		110	%	60 - 140
		(C6-C10)	2011/08/12		105	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene (sur.)	2011/08/12		95	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/08/12		107	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/12		47	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/12		92	%	60 - 140
		Benzene	2011/08/12		93	%	60 - 140
		Toluene	2011/08/12		100	%	60 - 140
		Ethylbenzene	2011/08/12		106	%	60 - 140
		m & p-Xylene	2011/08/12		110	%	60 - 140
		o-Xylene	2011/08/12		113	%	60 - 140
		(C6-C10)	2011/08/12		97	%	60 - 140
	Method Blank	1,4-Difluorobenzene (sur.)	2011/08/11		104	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/08/11		96	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/08/11		91	%	30 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/08/11		93	%	60 - 140
		Benzene	2011/08/11	<0.0050		mg/kg	
		Toluene	2011/08/11	<0.020		mg/kg	
		Ethylbenzene	2011/08/11	<0.010		mg/kg	

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Quality Assurance Report (Continued)

Maxxam Job Number: CB171795

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5081485 PX	Method Blank	Xylenes (Total)	2011/08/11	<0.040		mg/kg	
		m & p-Xylene	2011/08/11	<0.040		mg/kg	
		o-Xylene	2011/08/11	<0.020		mg/kg	
		F1 (C6-C10) - BTEX	2011/08/11	<12		mg/kg	
		(C6-C10)	2011/08/11	<12		mg/kg	
	RPD	Benzene	2011/08/12	NC		%	50
		Toluene	2011/08/12	NC		%	50
		Ethylbenzene	2011/08/12	NC		%	50
		Xylenes (Total)	2011/08/12	NC		%	50
		m & p-Xylene	2011/08/12	NC		%	50
		o-Xylene	2011/08/12	NC		%	50
		F1 (C6-C10) - BTEX	2011/08/12	NC		%	50
		(C6-C10)	2011/08/12	NC		%	50
5081536 KSA	RPD [BE6509-01]	Moisture	2011/08/11	7.3		%	20
5081553 KSA	RPD	Moisture	2011/08/11	3.4		%	20
5084107 TDB	Matrix Spike	Total Antimony (Sb)	2011/08/11		114	%	75 - 125
		Total Arsenic (As)	2011/08/11		95	%	75 - 125
		Total Barium (Ba)	2011/08/11		NC	%	75 - 125
		Total Beryllium (Be)	2011/08/11		101	%	75 - 125
		Total Cadmium (Cd)	2011/08/11		99	%	75 - 125
		Total Chromium (Cr)	2011/08/11		124	%	75 - 125
		Total Cobalt (Co)	2011/08/11		98	%	75 - 125
		Total Copper (Cu)	2011/08/11		95	%	75 - 125
		Total Lead (Pb)	2011/08/11		105	%	75 - 125
		Total Mercury (Hg)	2011/08/11		100	%	75 - 125
		Total Molybdenum (Mo)	2011/08/11		106	%	75 - 125
		Total Nickel (Ni)	2011/08/11		105	%	75 - 125
		Total Selenium (Se)	2011/08/11		96	%	75 - 125
		Total Silver (Ag)	2011/08/11		99	%	75 - 125
		Total Thallium (Tl)	2011/08/11		97	%	75 - 125
		Total Tin (Sn)	2011/08/11		102	%	75 - 125
		Total Uranium (U)	2011/08/11		96	%	75 - 125
		Total Vanadium (V)	2011/08/11		100	%	75 - 125
		Total Zinc (Zn)	2011/08/11		NC	%	75 - 125
	QC Standard	Total Arsenic (As)	2011/08/11		101	%	50 - 150
		Total Barium (Ba)	2011/08/11		105	%	69 - 131
		Total Chromium (Cr)	2011/08/11		105	%	41 - 159
		Total Cobalt (Co)	2011/08/11		100	%	75 - 125
		Total Copper (Cu)	2011/08/11		92	%	72 - 127
		Total Lead (Pb)	2011/08/11		99	%	54 - 146
		Total Nickel (Ni)	2011/08/11		100	%	61 - 139
		Total Vanadium (V)	2011/08/11		122	%	50 - 150
		Total Zinc (Zn)	2011/08/11		95	%	72 - 128
	Spiked Blank	Total Antimony (Sb)	2011/08/11		113	%	75 - 125
		Total Arsenic (As)	2011/08/11		90	%	80 - 107
		Total Barium (Ba)	2011/08/11		92	%	75 - 125
		Total Beryllium (Be)	2011/08/11		101	%	75 - 118
		Total Cadmium (Cd)	2011/08/11		95	%	75 - 125
		Total Chromium (Cr)	2011/08/11		93	%	75 - 125
		Total Cobalt (Co)	2011/08/11		96	%	75 - 125
		Total Copper (Cu)	2011/08/11		94	%	75 - 125
		Total Lead (Pb)	2011/08/11		103	%	82 - 118
		Total Mercury (Hg)	2011/08/11		102	%	75 - 125
		Total Molybdenum (Mo)	2011/08/11		98	%	75 - 125
		Total Nickel (Ni)	2011/08/11		95	%	75 - 125

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
P.O. #:
Site Location: 190 AIRPORT ROAD

Quality Assurance Report (Continued)

Maxxam Job Number: CB171795

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5084107 TDB	Spiked Blank	Total Selenium (Se)	2011/08/11		94	%	75 - 125
		Total Silver (Ag)	2011/08/11		96	%	75 - 125
		Total Thallium (Tl)	2011/08/11		96	%	75 - 125
		Total Tin (Sn)	2011/08/11		96	%	75 - 125
		Total Uranium (U)	2011/08/11		95	%	75 - 125
		Total Vanadium (V)	2011/08/11		97	%	75 - 125
		Total Zinc (Zn)	2011/08/11		99	%	75 - 125
	Method Blank	Total Antimony (Sb)	2011/08/11	<1		mg/kg	
		Total Arsenic (As)	2011/08/11	<1		mg/kg	
		Total Barium (Ba)	2011/08/11	<10		mg/kg	
		Total Beryllium (Be)	2011/08/11	<0.4		mg/kg	
		Total Cadmium (Cd)	2011/08/11	<0.1		mg/kg	
		Total Chromium (Cr)	2011/08/11	<1		mg/kg	
		Total Cobalt (Co)	2011/08/11	<1		mg/kg	
		Total Copper (Cu)	2011/08/11	<5		mg/kg	
		Total Lead (Pb)	2011/08/11	<1		mg/kg	
		Total Mercury (Hg)	2011/08/11	0.09, RDL=0.05		mg/kg	
		Total Molybdenum (Mo)	2011/08/11	<0.4		mg/kg	
		Total Nickel (Ni)	2011/08/11	<1		mg/kg	
		Total Selenium (Se)	2011/08/11	<0.5		mg/kg	
		Total Silver (Ag)	2011/08/11	<1		mg/kg	
		Total Thallium (Tl)	2011/08/11	<0.3		mg/kg	
		Total Tin (Sn)	2011/08/11	<1		mg/kg	
		Total Uranium (U)	2011/08/11	<1		mg/kg	
		Total Vanadium (V)	2011/08/11	<1		mg/kg	
		Total Zinc (Zn)	2011/08/11	<10		mg/kg	
	RPD	Total Antimony (Sb)	2011/08/11	NC		%	35
		Total Arsenic (As)	2011/08/11	4.9		%	35
		Total Barium (Ba)	2011/08/11	1.4		%	35
		Total Beryllium (Be)	2011/08/11	NC		%	35
		Total Cadmium (Cd)	2011/08/11	NC		%	35
		Total Chromium (Cr)	2011/08/11	3.9		%	35
		Total Cobalt (Co)	2011/08/11	2.9		%	35
		Total Copper (Cu)	2011/08/11	NC		%	35
		Total Lead (Pb)	2011/08/11	5.4		%	35
		Total Mercury (Hg)	2011/08/11	NC		%	35
		Total Molybdenum (Mo)	2011/08/11	NC		%	35
		Total Nickel (Ni)	2011/08/11	1.1		%	35
		Total Selenium (Se)	2011/08/11	NC		%	35
		Total Silver (Ag)	2011/08/11	NC		%	35
		Total Thallium (Tl)	2011/08/11	NC		%	35
		Total Tin (Sn)	2011/08/11	NC		%	35
		Total Uranium (U)	2011/08/11	NC		%	35
		Total Vanadium (V)	2011/08/11	6.4		%	35
		Total Zinc (Zn)	2011/08/11	NC		%	35
5085225 RL8	Matrix Spike	Soluble (Hot water) Boron (B)	2011/08/11		106	%	75 - 125
	Spiked Blank	Soluble (Hot water) Boron (B)	2011/08/11		103	%	75 - 125
	Method Blank	Soluble (Hot water) Boron (B)	2011/08/11	<0.1		mg/kg	
	RPD	Soluble (Hot water) Boron (B)	2011/08/11	NC		%	35
5086319 JW0	Matrix Spike	O-TERPHENYL (sur.)	2011/08/12		82	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/12		110	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2011/08/12		93	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2011/08/12		105	%	50 - 130
	Spiked Blank	O-TERPHENYL (sur.)	2011/08/12		75	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/12		102	%	70 - 130

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: 0125-036-01, RCMP-PRICE ALBERT
P.O. #:
Site Location: 190 AIRPORT ROAD

Quality Assurance Report (Continued)

Maxxam Job Number: CB171795

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5086319 JW0	Spiked Blank	F3 (C16-C34 Hydrocarbons)	2011/08/12		88	%	70 - 130
		F4 (C34-C50 Hydrocarbons)	2011/08/12		100	%	70 - 130
	Method Blank	O-TERPHENYL (sur.)	2011/08/12		86	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/08/12	<10		mg/kg	
		F3 (C16-C34 Hydrocarbons)	2011/08/12	<10		mg/kg	
		F4 (C34-C50 Hydrocarbons)	2011/08/12	<10		mg/kg	
	RPD	F2 (C10-C16 Hydrocarbons)	2011/08/12	NC		%	50
		F3 (C16-C34 Hydrocarbons)	2011/08/12	35.7		%	50
		F4 (C34-C50 Hydrocarbons)	2011/08/12	10.1		%	50

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone(403) 291-3077 Fax(403) 291-9468

Validation Signature Page

Maxxam Job #: B171795

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

Janet Gao, Senior Analyst, Organics Department

Ghayasuddin Khan, M.Sc., B.Ed., P.Chem, Senior Analyst, Water Lab

==

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Maxxam

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Chain of Custody A074130

Page: 1 of 35

	Invoice To:	C/O Report Address ☐
Company:	EGE ENGINEERING	
Contact:	D. KLASSEN	
Address:	511 PEPPERLOAF CRES	
	Prov: WPG, MB	PC: R3R1E6
Contact #s:	Ph: 204-896-8264	Cell: 612 6944

Report To: Same as Invoice ☐ — Prov: PC: Ph: Cell:

Report Distribution (E-Mail):
apassalis@mts.net
david.klassen@mts.net
lbielus@mts.net

REGULATORY GUIDELINES:
☐ AT1
☒ CCME
☐ Regulated Drinking Water
☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:	0125-036-01
Project # / Name:	RCMP - PRINCE ALBERT
Site Location:	190 AIRPORT ROAD
Quote #:	
Sampled By:	A. PASSALIS

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~~ GRAINSIZE	VOC'S	GLYCOL	O+G (ONLY IF SUFF. SAMPLE)	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	HOLD - Do not Analyze	# of Containers Submitted
1	PA-01/02 - 5		S	11/08/02	X																		1
2	- 7				X																		1
3	- 12				X																		1
4	PA-03/04 - 5				X		X				X	X	X										2
5	- ~~8~~ 7				X		~~X~~				~~X~~	~~X~~	~~X~~										2
6	- 14				X																		1
7	PA-05 - 5				X					X													2
8	- 8			11/08/03	X																		1
9	PA-06 - 5				X																		1
10	PA-07 - 5				X																		1
11	- 7				X																		1
12	PA-08 - 5				X																		1

Please indicate Filtered, Preserved or Both (F, P, F/P) → F/P

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
[signature]	11/08/05	12:30
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions: CHROMATOGRAMS REQUIRED ON ALL SAMPLES

# of Jars Used & Not Submitted:

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: B171795
Sohail Rajput	11/08/05	12:30	

Custody Seal	Temperature	Ice
N	7.8, 10, 5.9 / 12.0, 11.6, 9.3 / 8.6, 8.3, 9.1 / 7.1, 6.6, 8.9	Y

Lab Comments: RECEIVED AUG 0 6 2011 [initials] 9:40

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Chain of Custody A074131

Page: 2 of 5

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐	Report Distribution (E-Mail):
Company:	EGE ENGINEERING		
Contact:			
Address:			
	Prov: PC:	Prov: PC:	
Contact #s:	Ph: 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:	0125-036-01
Site Location:	RCMP PRINCE ALBERT
Quote #:	
Sampled By:	

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	VOC'S	GLYCOL	O+G (IF SUFF. SAMPLE)	WATER: ☐BTEX F1 ☐VOCs	WATER: ☐BTEX F1-F2 ☐BTEX F1-F4	WATER: ☐ Routine Water ☐ Turb ☐ F	WATER: ☐ TOC ☐ DOC	WATER: Regulated Metals (CCME / AT1) Total	WATER: Regulated Metals Dissolved	WATER: Mercury ☐ Total ☐ Dissolved	Other Analysis	HOLD - Do not Analyze	# of Containers Submitted
1	PA-08-6		S	11/08/03	X																		1
2	PA-09-5				X																		1
3	PA-10-7				X																		1
4	PA-11-1			11/08/02			X					X	X										1
5	PA-11-4				X						X												1
6	PA-12-4				X																		1
7	PA-13-6			11/08/03	X																		1
8	PA-14-4				X																		1
9	PA-15-1				X																		1
10	PA-16-1				X																		1
11	PA-17-4				X																		1
12	BD1				X																		1

Please indicate Filtered, Preserved or Both (F, P, F/P) F/P

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
	11/08/05	12:30
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions: , | # of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #:		
Sohail Rajput	11/08/		Custody Seal	Temperature	Ice
Lab Comments:			N	7.8, 10.0, 5.9 / 12.0, 11.6, 9.3 / 8.6, 8.3, 9.1 / 7.1, 6.6, 8.9	Y

RECEIVED AUG 06 2011 9:40

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Page 37 of 42

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Chain of Custody A074132

Page: 3 of 5

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐	Report Distribution (E-Mail):
Company:	EGE ENGINEERING		
Contact:			
Address:	Prov: PC:	Prov: PC:	
Contact #s:	Ph: 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 #:	0125-036-01
Project # / Name:	
Site Location:	RCMP PRINCE ALBERT
Quote #:	
Sampled By:	

SERVICE REQUESTED: ☐ RUSH (Contact lab to reserve) Date Required: ☒ REGULAR (5 to 7 Days)

See reverse for package specifics

SOIL | WATER | Other Analysis

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	BTEX F1-F4	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals	~~Basic Class II Landfill~~ GRAIN SIZE	VOCS	GLYCOL	O+G (ONLY IF SUFF SAMPLE)	☐BTEX F1 ☐VOCs	☐BTEX F1-F2 ☐BTEX F1-F4	☐ Routine Water ☐ Turb ☐ F	☐ TOC ☐ DOC	Regulated Metals (CCME / AT1) Total	Dissolved	Mercury ☐ Total ☐ Dissolved	HOLD - Do not Analyze	# of Containers Submitted
1	BD2		S	11/08/03	X																	1
2	BD3		S	11/08/02			X				X	X	X									1
3	PA-05-3		S							X												1
4	PA-10-7		S							X												1
5	PA-02-12		S							X												1
6	PA-13-7		S	11/08/03			X				X	X	X									2
7																						
8																						
9																						
10																						
11																						
12																						

Please indicate Filtered, Preserved or Both (F, P, F/P) F/P

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
[signature]	11/08/05	12:30
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions: | # of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #:
Sohail Rauf	11/08/05	12:30	

Custody Seal	Temperature	Ice
N	7.8, 10, 5.9 12.0, 11.6, 9.3 8.6, 8.3, 9.1 7.1, 6.6, 8.9	Y

Lab Comments:

RECEIVED AUG 05 2011 9:40

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Chain of Custody A074135

Page: 4 of 5

	Invoice To: C/O Report Address ☐	Report To: Same as Invoice ☐	Report Distribution (E-Mail):	REGULATORY GUIDELINES:
Company:	ELE ENGINEERING			☐ AT1
Contact:				☐ CCME
Address:	Prov: PC:	Prov: PC:		☐ Regulated Drinking Water
Contact #s:	Ph: Cell:	Ph: Cell:		☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:	0125-036-01
Project # / Name:	RCMP PRINCE ALBERT
Site Location:	
Quote #:	
Sampled By:	

SERVICE REQUESTED: ☐ RUSH (Contact lab to reserve) Date Required: ☒ REGULAR (5 to 7 Days)

See reverse for package specifics

Analysis columns — 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. HOLD - Do not Analyze; # of Containers Submitted.

#	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	HOLD - Do not Analyze	# of Containers Submitted
1	PA-~~[illegible]~~06-8		S	11/08/03	X	
2	PA-C4-14			11/08/02	X	
3	PA-03-2			" 02	X	
4	PA-05-6			" 02	X	
5	PA-06-2			11/08/03	X	
6	PA-06-4			03	X	
7	PA-07-3			↓	X	
8	PA-08-3				X	
9	PA-09-4				X	
10	PA-09-8				X	
11	PA-10-4				X	
12	PA-10-6			↓	X	

Please indicate Filtered, Preserved or Both (F, P, F/P) → F/P

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
[signature]	11/08/05	12:30
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions: | # of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #:		
[signature] Sohail Rajput	11/08/06	12:30	Custody Seal	Temperature	Ice
Lab Comments:			N	7.8, 10.0, 5.9 / 12.6, 11.6, 9.3 / 8.6, 8.3, 9.1 / 7.1, 6.6, 8.9	Y

RECEIVED AUG 06 2011 [illegible] 9:00

AB FCD-00331 Rev3 2010/05

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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

A074136

Page: 5 of 5

Company:	Invoice To: EGE ENGINEERING	C/O Report Address ☐	Report To:	Same as Invoice ☐	Report Distribution (E-Mail):
Contact:					
Address:	Prov:	PC:	Prov:	PC:	
Contact #s:	Ph:	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 #:	0125-036-01
Project # / Name:	RCMP PRINCE ALBERT
Site Location:	
Quote #:	
Sampled By:	

SERVICE REQUESTED: ☐ RUSH (Contact lab to reserve) Date Required: ☒ REGULAR (5 to 7 Days)

See reverse for package specifics

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

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	HOLD - Do not Analyze	# of Containers Submitted
1	PA - 11-5			11/08/02	X	1
2	PA - 11-7				X	1
3	PA - 12-1					1
4	PA - 12-5				X	1
5	PA - 13-1			11/08/03	X	1
6	~~[illegible]~~				~~[illegible]~~	
7	PA - 13-8				X	1
8	PA - 14-5				X	1
9	PA - 14-8				X	1
10	PA - 15-3				X	1
11	PA - 16-3				X	1
12	PA - 17-5				X	1
	PA - 17-8				X	1

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
[signature]	11/08/05	12:30
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions:

# of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #:	Custody Seal	Temperature	Ice
Sohail Rupu	11/08/05	12:30		✓	7.8, 10, 5.9; 12.0, 11.6, 9.3; 8.6, 8.3, 9.1; 7.1, 6.6, 8.9	Y

Lab Comments:

RECEIVED AUG 06 2011 382.12 9:40

Jason Bil

From: Cynny Hagen
Sent: Wednesday, August 10, 2011 11:23 AM
To: Jason Bil; Mary Xu
Subject: add on

Job #:	B171795
Samples:	BE6509
Analysis:	Sieve
TAT:	Reg
Confirmation Date/Time:	2011-08-10 @10:55

Hold Time Checked:	yes
Containers Verified:	yes

Comments:	Sample is on hold

Cynny Hagen, Chem Tech
Environmental Project Manager
chagen@maxxam.ca

Office 403 735 2239
Toll free 800 386 7247 / Fax 403 735 2240

4000 19 St NE / Calgary, AB Canada T2E 6P8

NOTE:
SUMMER HOURS START MAY 8, 2011:
Sample Reception Hours: Mon-Fri 8am-8pm, Sat/Sun 9am-5pm
Office Hours: Mon-Fri 8am-5pm
Other members of my team include:
Carissa Sumka, csumka@maxxam.ca, 403-735-2205
Barney Quong, bquong@maxxam.ca, 403-219-3662

2011/08/10

Jason Bil

From: Cynny Hagen
Sent: Wednesday, August 10, 2011 3:00 PM
To: Jason Bil; Mary Xu
Subject: add on

Job #:	B171795
Samples:	BE6509, BE6510 & BE6518
Analysis:	ABF1F4
TAT:	REG
Confirmation Date/Time:	2011-08-10 @ 1:34 PM

Hold Time Checked:	YES
Containers Verified:	YES

Comments:	Thank you

Cynny Hagen, Chem Tech
Environmental Project Manager
chagen@maxxam.ca

Office 403 735 2239
Toll free 800 386 7247 / Fax 403 735 2240

4000 19 St NE / Calgary, AB Canada T2E 6P8

Maxxam Analytics - Success Through Science®
maxxam.ca

NOTE:
SUMMER HOURS START MAY 8, 2011:
Sample Reception Hours: Mon-Fri 8am-8pm, Sat/Sun 9am-5pm
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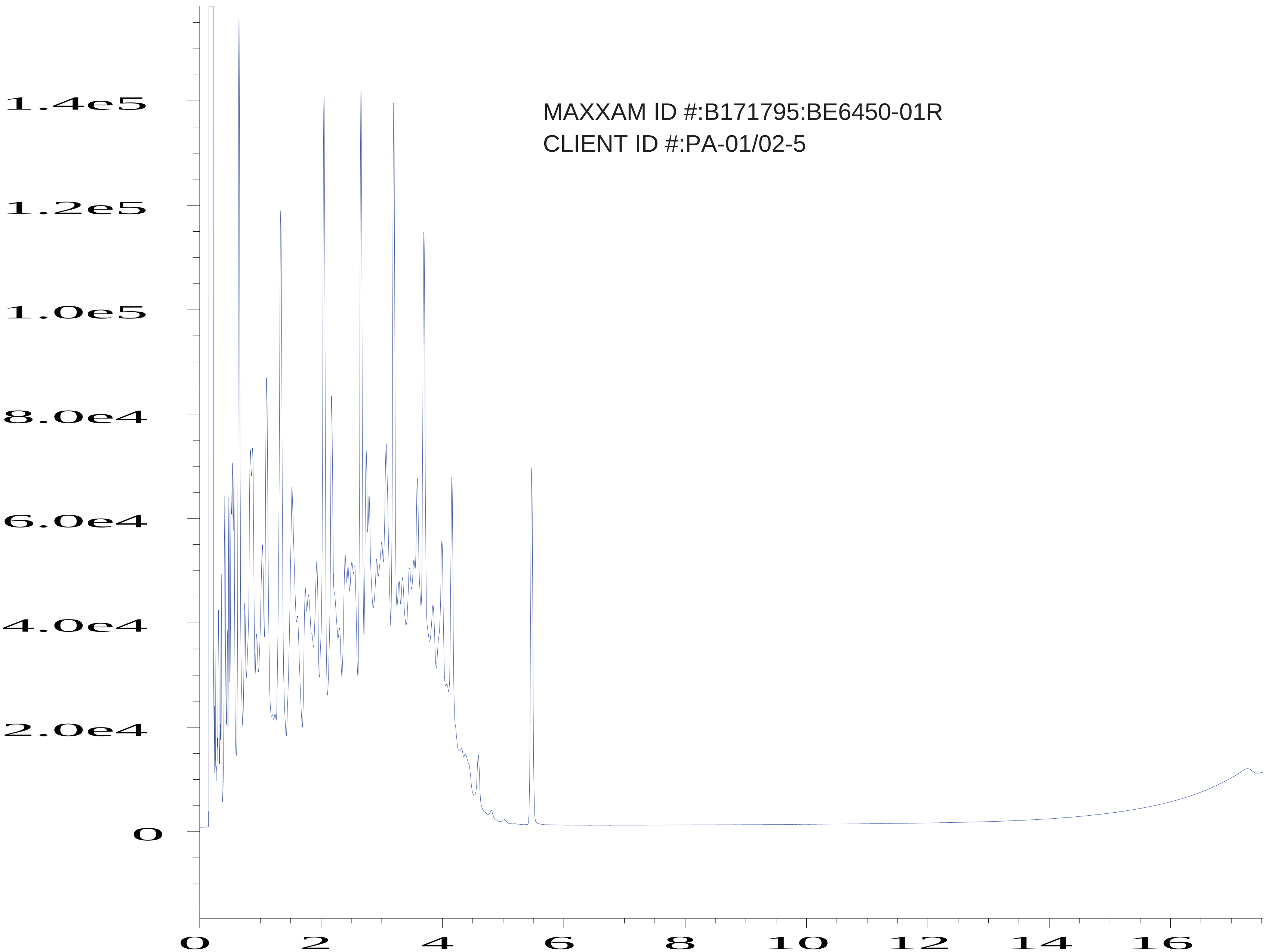
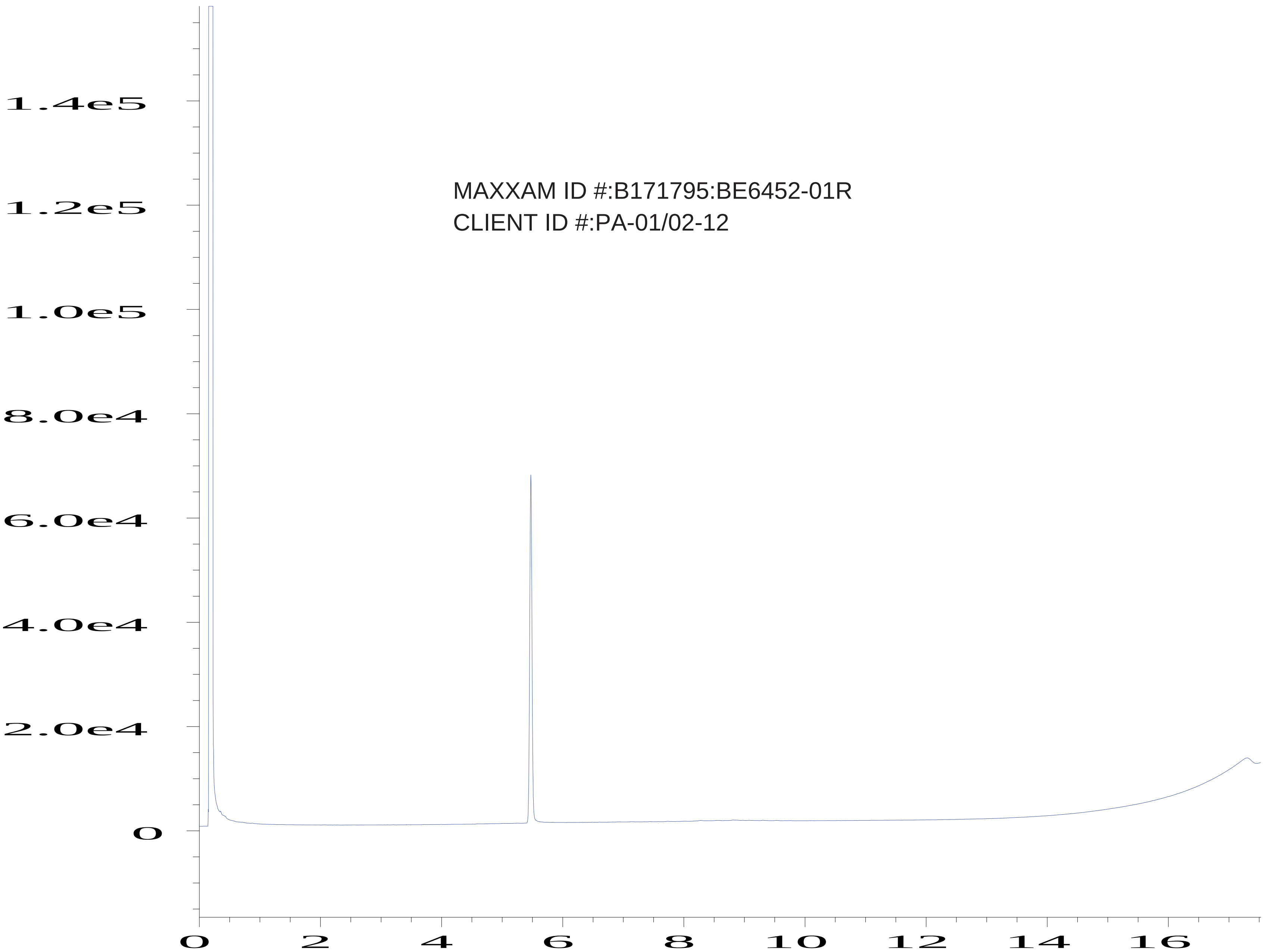
Other members of my team include:
Carissa Sumka, csumka@maxxam.ca, 403-735-2205
Barney Quong, bquong@maxxam.ca, 403-219-3662

2011/08/10

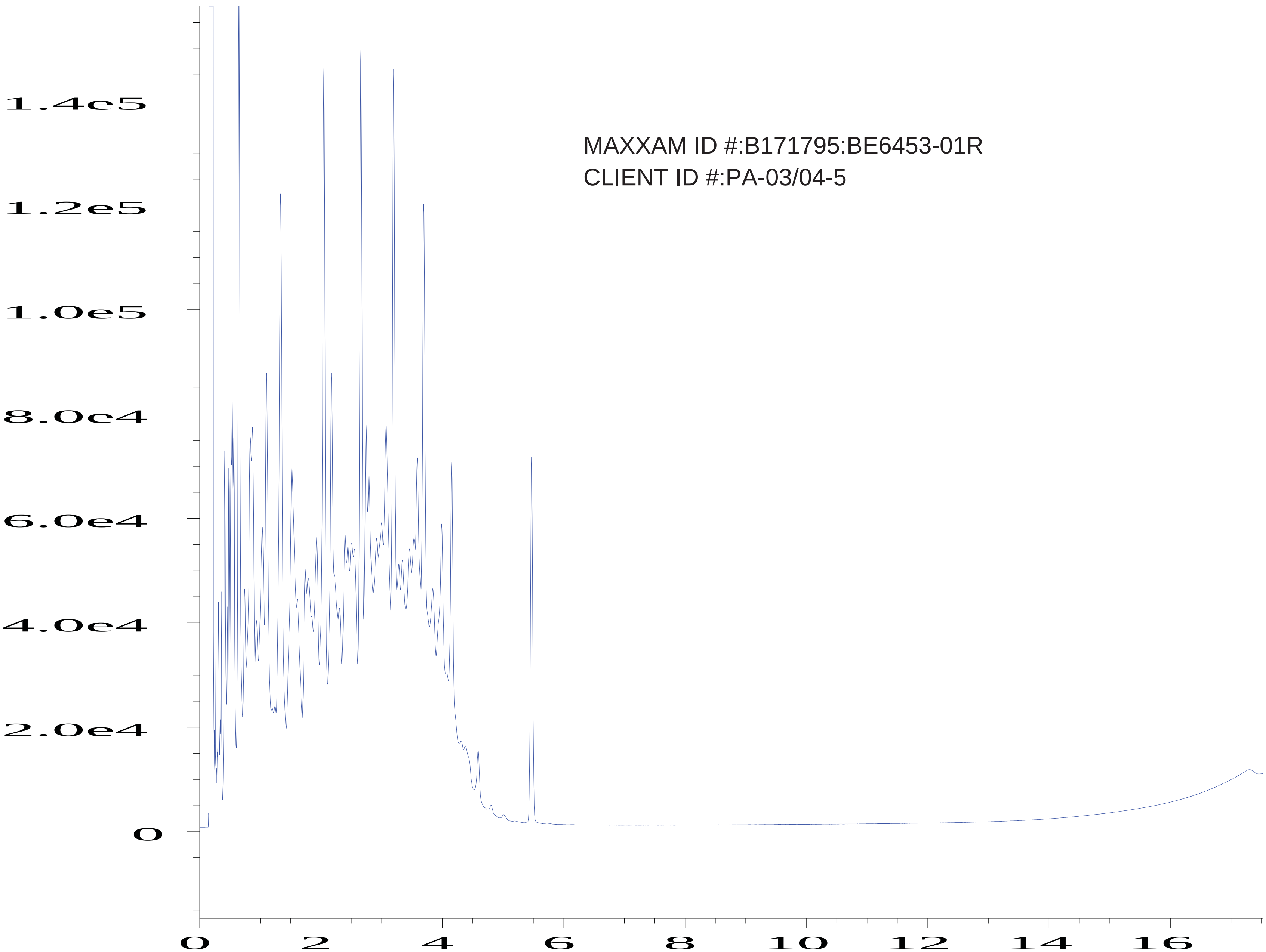


Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\071R0101.D
Operator : GC 9 FID   Page Number : 1
Instrument : INSTRUMEN   Vial Number : 71
Sample Name : 5077649:BE6450   Injection Number : 1
Run Time Bar Code: Sequence Line : 1
Acquired on : 11 Aug 11 11:40 PM   Instrument Method: RUN0811F.MTH
Report Created on: 12 Aug 11 11:27 AM   Analysis Method : CCM0811R.MTH

Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\072R0101.D
Operator : GC 9 FID   Page Number : 1
Instrument : INSTRUMEN   Vial Number : 72
Sample Name : 5077649:BE6451   Injection Number : 1
Run Time Bar Code: Sequence Line : 1
Acquired on : 12 Aug 11 00:10 AM   Instrument Method: RUN0811F.MTH
Report Created on: 12 Aug 11 11:28 AM   Analysis Method : CCM0811R.MTH

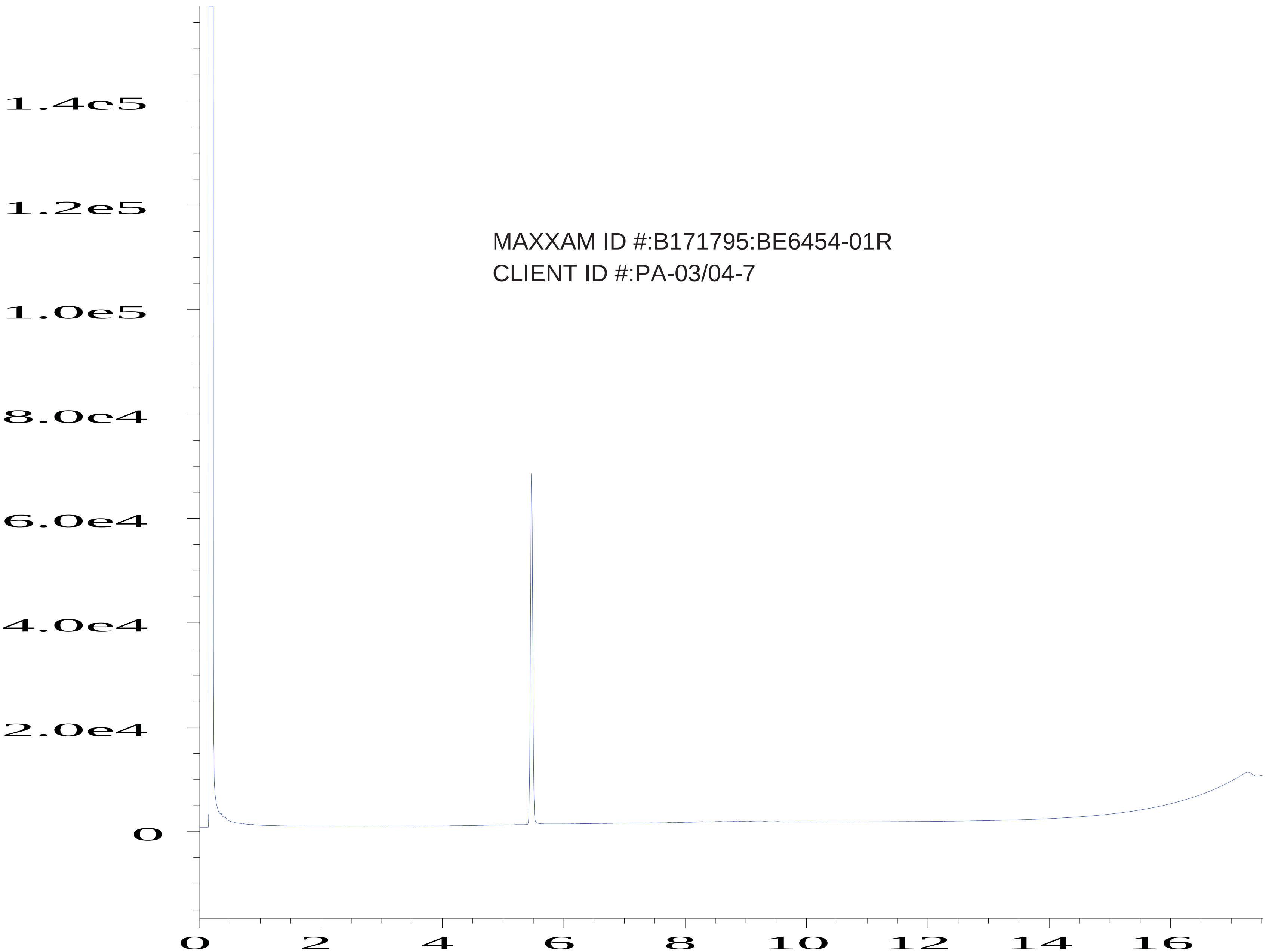


Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\066R0101.D
Operator : GC 9 FID
Page Number : 1
Instrument : INSTRUMEN
Vial Number : 66
Sample Name : 5077649:BE6452
Injection Number : 1
Run Time Bar Code:
Sequence Line : 1
Acquired on : 11 Aug 11 09:14 PM
Instrument Method: RUN0811F.MTH
Report Created on: 12 Aug 11 11:26 AM
Analysis Method : CCM0811R.MTH

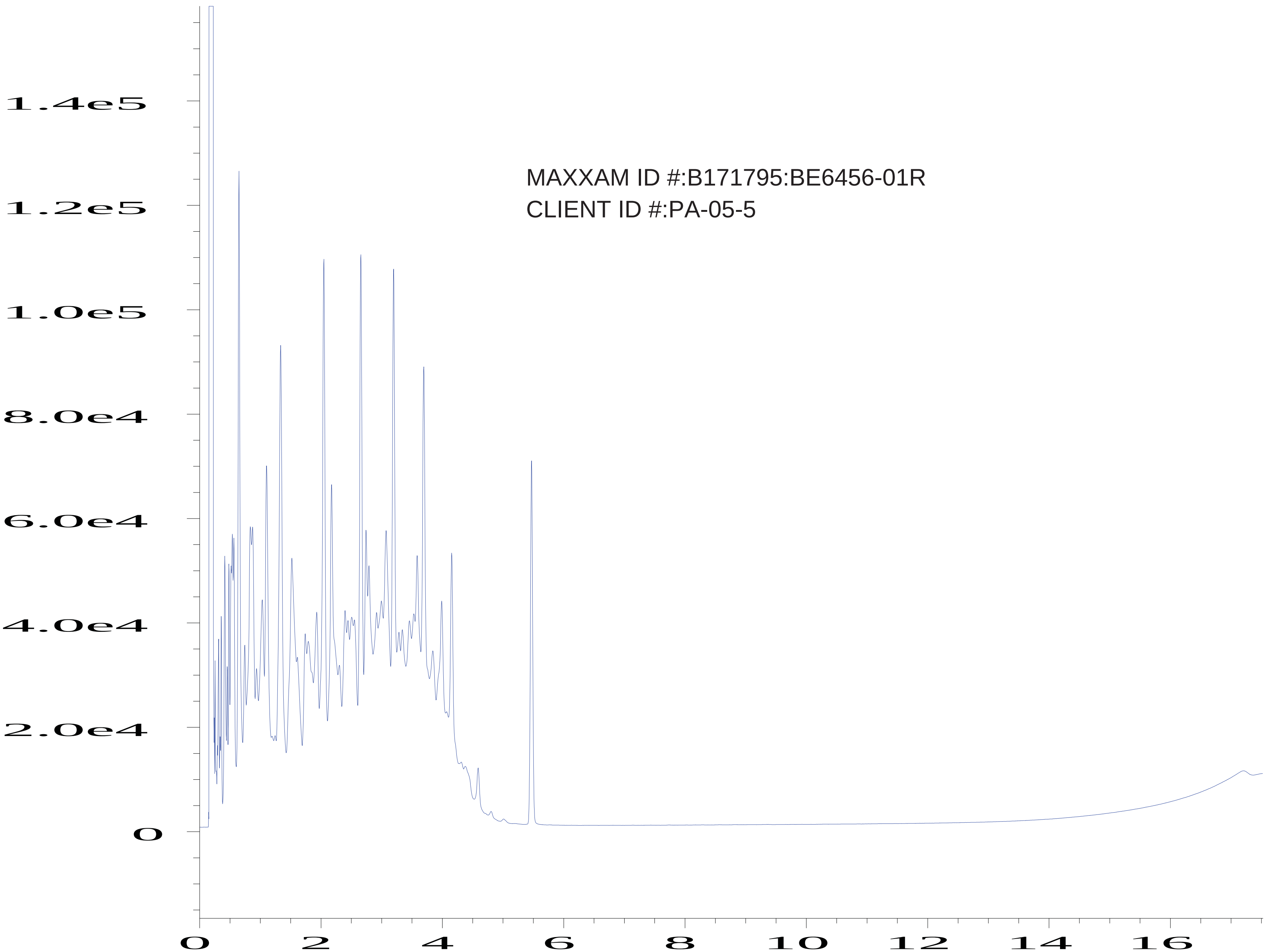


MAXXAM ID #:B171795:BE6453-01R
CLIENT ID #:PA-03/04-5

Data File Name	: O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\073R0101.D		
Operator	: GC 9 FID	Page Number	: 1
Instrument	: INSTRUMEN	Vial Number	: 73
Sample Name	: 5077649:BE6453	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 12 Aug 11 00:39 AM	Instrument Method:	RUN0811F.MTH
Report Created on:	12 Aug 11 11:29 AM	Analysis Method	: CCM0811R.MTH

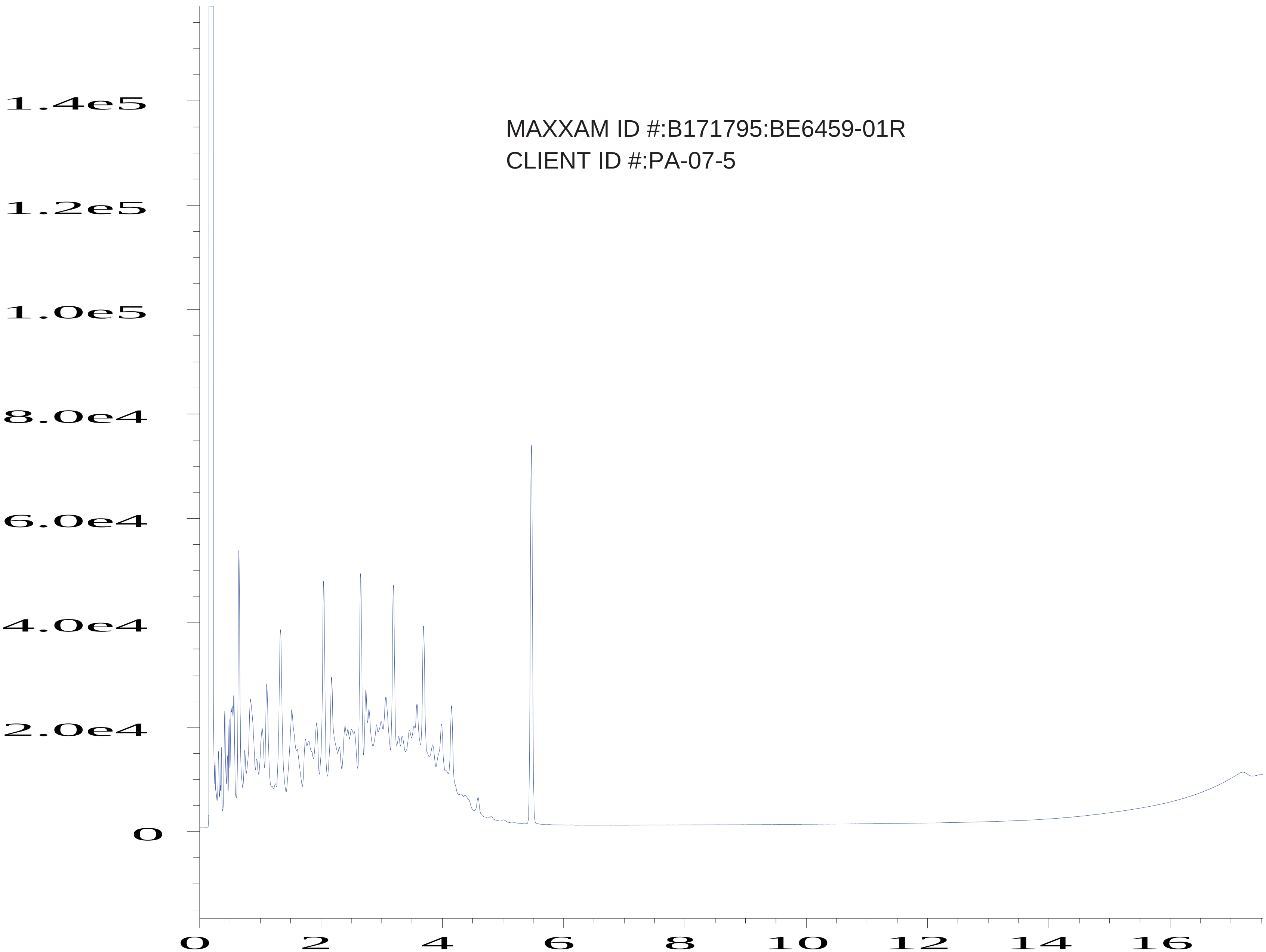


Data File Name	: O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\074R0101.D		
Operator	: GC 9 FID	Page Number	: 1
Instrument	: INSTRUMEN	Vial Number	: 74
Sample Name	: 5077649:BE6454	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 12 Aug 11 01:08 AM	Instrument Method:	RUN0811F.MTH
Report Created on:	12 Aug 11 11:30 AM	Analysis Method	: CCM0811R.MTH

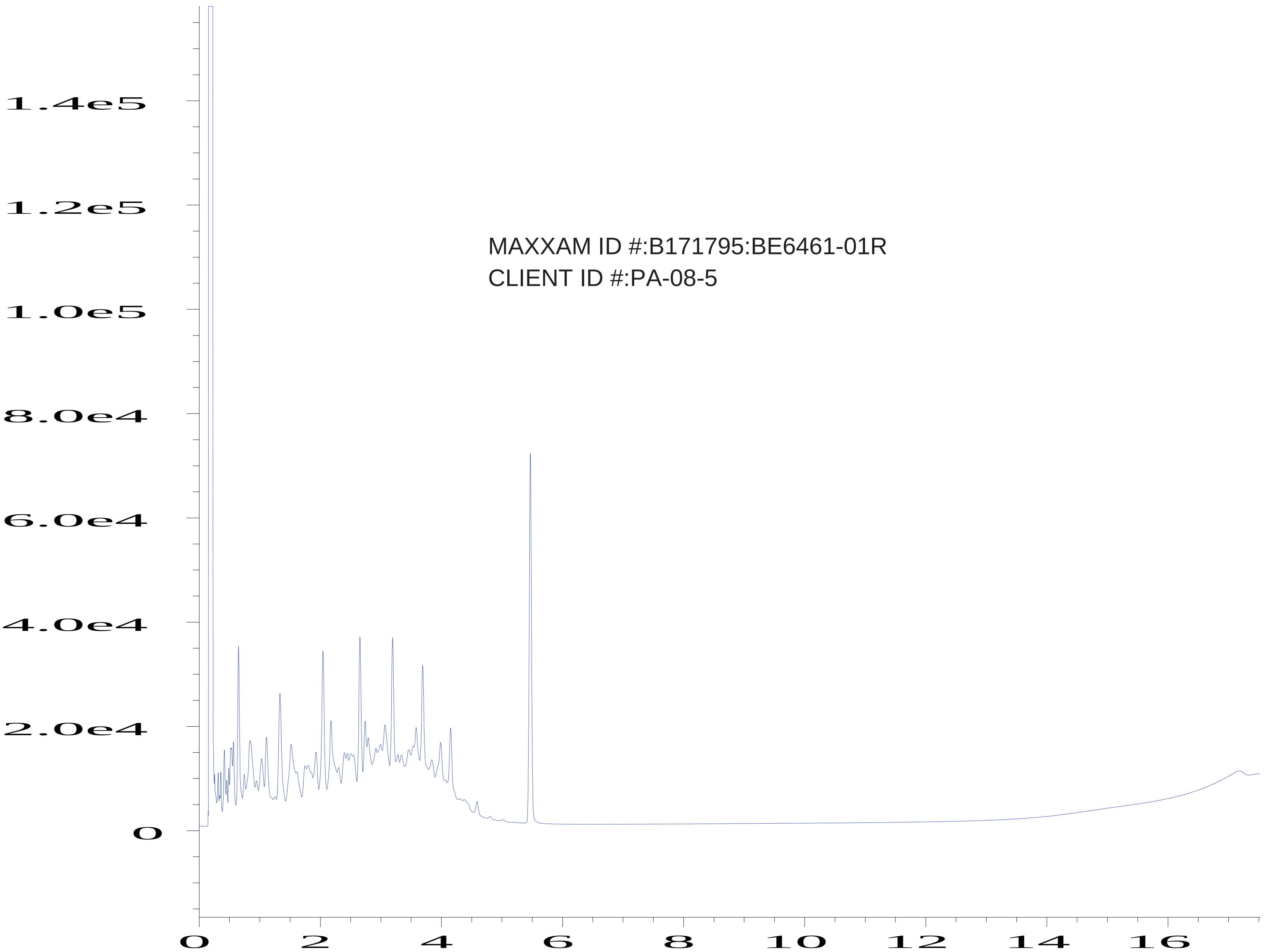


Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\077R0101.D
Operator : GC 9 FID
Instrument : INSTRUMEN
Sample Name : 5077649:BE6456
Run Time Bar Code:
Acquired on : 12 Aug 11 02:36 AM
Report Created on: 12 Aug 11 11:30 AM
Page Number : 1
Vial Number : 77
Injection Number : 1
Sequence Line : 1
Instrument Method: RUN0811F.MTH
Analysis Method : CCM0811R.MTH

Data File Name	: O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\078R0101.D		
Operator	: GC 9 FID	Page Number	: 1
Instrument	: INSTRUMEN	Vial Number	: 78
Sample Name	: 5077649:BE6457	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 12 Aug 11 03:05 AM	Instrument Method:	RUN0811F.MTH
Report Created on:	12 Aug 11 11:32 AM	Analysis Method	: CCM0811R.MTH



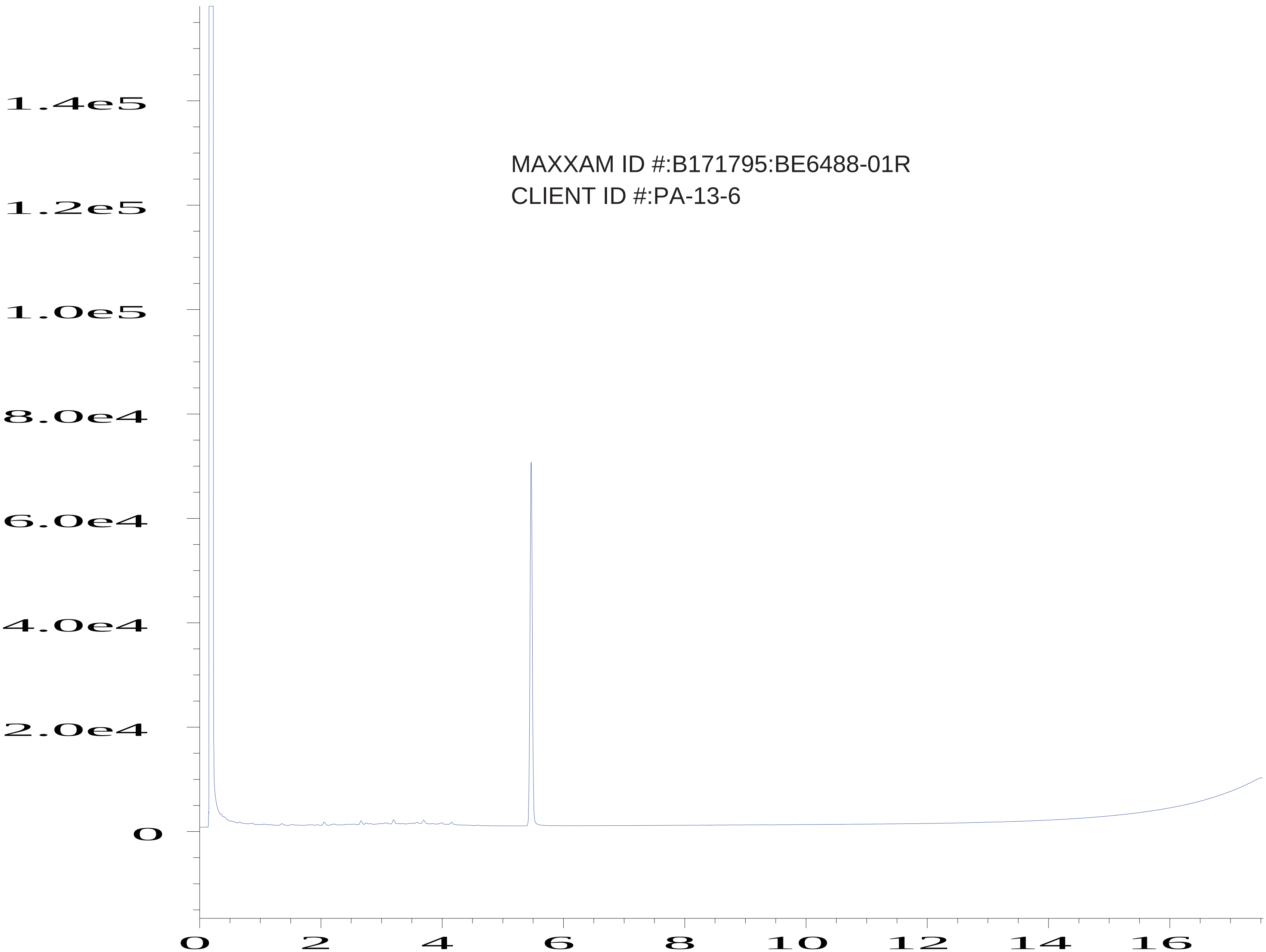
Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\080R0101.D
Operator : GC 9 FID
Instrument : INSTRUMEN
Sample Name : 5077649:BE6459
Run Time Bar Code:
Acquired on : 12 Aug 11 04:03 AM
Report Created on: 12 Aug 11 11:32 AM
Page Number : 1
Vial Number : 80
Injection Number : 1
Sequence Line : 1
Instrument Method: RUN0811F.MTH
Analysis Method : CCM0811R.MTH



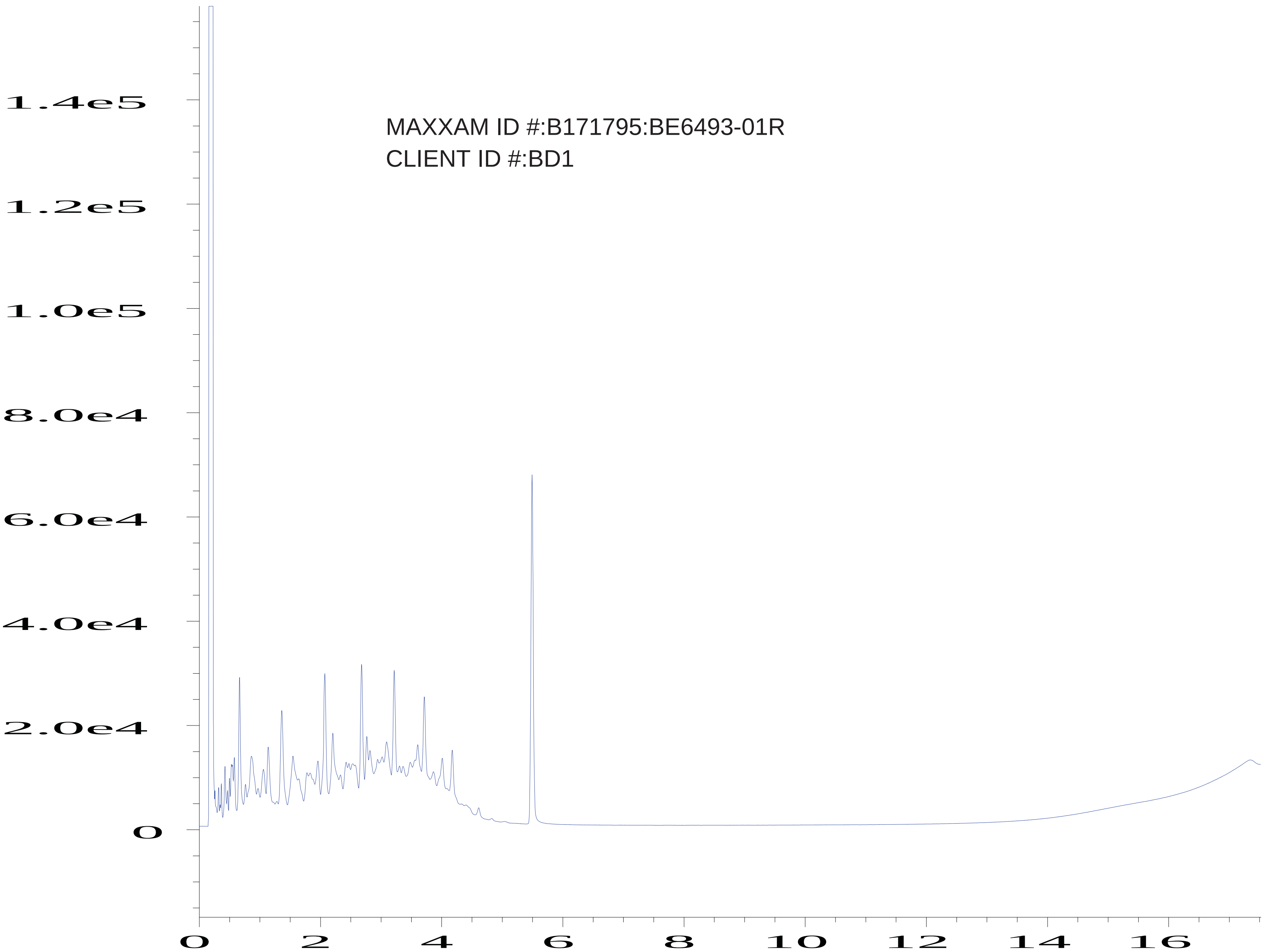
Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\084R0101.D
Operator : GC 9 FID
Instrument : INSTRUMEN
Sample Name : 5077649:BE6461
Run Time Bar Code:
Acquired on : 12 Aug 11 06:00 AM
Report Created on: 12 Aug 11 11:33 AM

Page Number : 1
Vial Number : 84
Injection Number : 1
Sequence Line : 1
Instrument Method: RUN0811F.MTH
Analysis Method : CCM0811R.MTH

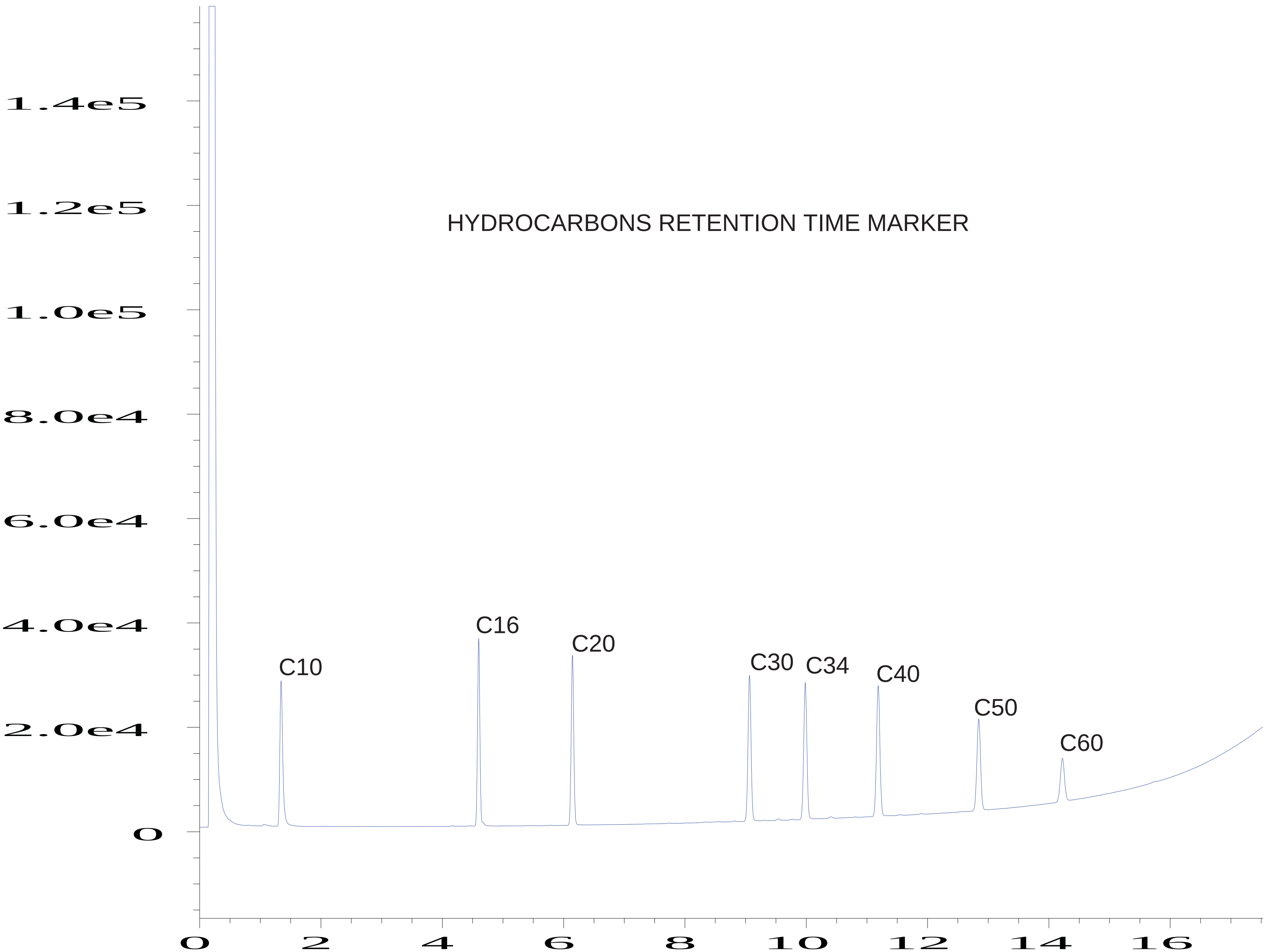
Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\086R0101.D
Operator : GC 9 FID
Instrument : INSTRUMEN
Sample Name : 5077649:BE6483
Run Time Bar Code:
Acquired on : 12 Aug 11 06:59 AM
Report Created on: 12 Aug 11 11:34 AM
Page Number : 1
Vial Number : 86
Injection Number : 1
Sequence Line : 1
Instrument Method: RUN0811F.MTH
Analysis Method : CCM0811R.MTH



Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\091R0101.D
Operator : GC 9 FID
Instrument : INSTRUMEN
Sample Name : 5077649:BE6488
Run Time Bar Code:
Acquired on : 12 Aug 11 09:25 AM
Report Created on: 12 Aug 11 11:34 AM
Page Number : 1
Vial Number : 91
Injection Number : 1
Sequence Line : 1
Instrument Method: RUN0811F.MTH
Analysis Method : CCM0811R.MTH



Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0810\086R0101.D
Operator : GC 9 FID
Instrument : INSTRUMEN
Sample Name : 5074307:BE6493
Run Time Bar Code:
Acquired on : 11 Aug 11 05:10 AM
Report Created on: 12 Aug 11 11:24 AM
Page Number : 1
Vial Number : 86
Injection Number : 1
Sequence Line : 1
Instrument Method: RUN0810F.MTH
Analysis Method : CCM0811R.MTH



Data File Name : O:\USERS\...\HPCHEM\3\DATA\2011\AUG201~1\RUN0811\055R0201.D
Operator : GC 9 FID
Instrument : INSTRUMEN
Sample Name : RT MARKER
Run Time Bar Code:
Acquired on : 11 Aug 11 03:28 PM
Report Created on: 12 Aug 11 11:35 AM

Page Number : 1
Vial Number : 55
Injection Number : 1
Sequence Line : 2
Instrument Method: RUN0811F.MTH
Analysis Method : CCM0811R.MTH

The chromatograms are provided for information purposes only. Any conclusion drawn by the data user from these chromatograms is their sole responsibility. Maxxam can assume no liability for any such 3rd party interpretations and is responsible only for the quality of the quantitative data provided.

Maxxam

Success Through Science®

Your P.O. #: 0125-036-01
Your Project #: RCMP-PRINCE ALBERT
Site Location: 190 AIRPORT ROAD, PRINCE ALBERT
Your C.O.C. #: A074395

Attention: ANDREW PASSALIS
EGE ENGINEERING LTD.
511 PEPPERLOAF CRESENT
WINNIPEG, MB
CANADA R3R 1E6

Report Date: 2011/10/17

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B195841
Received: 2011/10/05, 9:00

Sample Matrix: Soil
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS (MeOH extract)	6	2011/10/06	2011/10/08	CAL SOP-00190	CCME CWS, EPA 8260C
BTEX/F1 by HS GC/MS (MeOH extract)	1	2011/10/06	2011/10/11	CAL SOP-00190	CCME CWS, EPA 8260C
CCME Hydrocarbons (F2-F4 in soil)	7	2011/10/06	2011/10/12	AB SOP-00040 AB SOP-00036	CCME PHC-CWS
Moisture	7	N/A	2011/10/06	CAL SOP-00023	McKeague MSSMA 2.411
Particle Size by Sieve (75 micron)	1	N/A	2011/10/13	AB SOP-00022	SSMA 55.4

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS	4	N/A	2011/10/07	CAL SOP-00190	CCME CWS, EPA 8260C
CCME Hydrocarbons (F2-F4 in water)	4	2011/10/16	2011/10/16	CAL SOP-00086 AB SOP-00037	EPA3510C/CCME PHCCWS

Encryption Key

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

Parminder Virk, Project Manager
Email: PVirk@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

Success Through Science®

Maxxam Job #: B195841
Report Date: 2011/10/17

EGE ENGINEERING LTD.
Client Project #: RCMP-PRINCE ALBERT
Site Location: 190 AIRPORT ROAD, PRINCE ALBERT
Your P.O. #: 0125-036-01
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BT1479 PA-18-5							
Sampling Date 2011/10/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	20	0.3	%			TX	5245791
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	7400	10	mg/kg			NK3	5253376
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
Reached Baseline at C50	YES		mg/kg			NK3	5253376
O-TERPHENYL (sur.)	85	50 - 130	%			NK3	5253376
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	0.30	0.0050	mg/kg			RSU	5245896
Dup. Benzene	0.42	0.0050	mg/kg			RSU	5245896
Toluene	0.35	0.020	mg/kg			RSU	5245896
Dup. Toluene	0.45	0.020	mg/kg			RSU	5245896
Ethylbenzene	8.3	0.010	mg/kg			RSU	5245896
Dup. Ethylbenzene	9.5	0.010	mg/kg			RSU	5245896
Xylenes (Total)	58	0.040	mg/kg			RSU	5245896
Dup. Xylenes (Total)	65	0.040	mg/kg			RSU	5245896
m & p-Xylene	38	0.040	mg/kg			RSU	5245896
Dup. m & p-Xylene	43	0.040	mg/kg			RSU	5245896
o-Xylene	19	0.020	mg/kg			RSU	5245896
Dup. o-Xylene	21	0.020	mg/kg			RSU	5245896
F1 (C6-C10) - BTEX	1400 (1)	120	mg/kg			RSU	5245896
Dup. F1 (C6-C10) - BTEX	1600	12	mg/kg			RSU	5245896
(C6-C10)	1500 (1)	120	mg/kg			RSU	5245896
Dup. (C6-C10)	1700	12	mg/kg			RSU	5245896
1,4-Difluorobenzene (sur.)	104	60 - 140	%			RSU	5245896
Dup. 1,4-Difluorobenzene (sur.)	114	60 - 140	%			RSU	5245896
4-BROMOFLUOROBENZENE (sur.)	194 (2)	60 - 140	%			RSU	5245896
Dup. 4-BROMOFLUOROBENZENE (sur.)	160 (2)	60 - 140	%			RSU	5245896
D10-ETHYLBENZENE (sur.)	103	60 - 130	%			RSU	5245896
Dup. D10-ETHYLBENZENE (sur.)	104	60 - 130	%			RSU	5245896
D4-1,2-DICHLOROETHANE (sur.)	113	60 - 140	%			RSU	5245896
Dup. D4-1,2-DICHLOROETHANE (sur.)	122	60 - 140	%			RSU	5245896

(1) Detection limit raised due to dilution to bring analyte within the calibrated range.
(2) Please note that the recovery of some compounds are outside control limits however the overall quality control for this analysis meets our acceptability criteria.

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BT1488 PA-18-7							
Sampling Date 2011/10/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	22	0.3	%			TX	5245791
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
F3 (C16-C34 Hydrocarbons)	130	10	mg/kg			NK3	5253376
F4 (C34-C50 Hydrocarbons)	42	10	mg/kg			NK3	5253376
Reached Baseline at C50	YES		mg/kg			NK3	5253376
O-TERPHENYL (sur.)	85	50 - 130	%			NK3	5253376

Maxxam Job #: B195841
Report Date: 2011/10/17

EGE ENGINEERING LTD.
Client Project #: RCMP-PRINCE ALBERT
Site Location: 190 AIRPORT ROAD, PRINCE ALBERT
Your P.O. #: 0125-036-01
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BT1488 PA-18-7							
Sampling Date 2011/10/03							
Matrix SOIL							
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5245896
Toluene	<0.020	0.020	mg/kg			RSU	5245896
Ethylbenzene	0.013	0.010	mg/kg			RSU	5245896
Xylenes (Total)	0.10	0.040	mg/kg			RSU	5245896
m & p-Xylene	0.065	0.040	mg/kg			RSU	5245896
o-Xylene	0.035	0.020	mg/kg			RSU	5245896
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5245896
(C6-C10)	<12	12	mg/kg			RSU	5245896
1,4-Difluorobenzene (sur.)	101	60 - 140	%			RSU	5245896
4-BROMOFLUOROBENZENE (sur.)	99	60 - 140	%			RSU	5245896
D10-ETHYLBENZENE (sur.)	96	60 - 130	%			RSU	5245896
D4-1,2-DICHLOROETHANE (sur.)	104	60 - 140	%			RSU	5245896
BT1489 PA-19-5							
Sampling Date 2011/10/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Sieve - Pan	2.2	0.2	%			LZ0	5252429
Sieve - #200 (>0.075mm)	98	0.2	%			LZ0	5252429
Grain Size	COARSE	0.2	%			LZ0	5252429
Moisture	16	0.3	%			TX	5245791
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
Reached Baseline at C50	YES		mg/kg			NK3	5253376
O-TERPHENYL (sur.)	86	50 - 130	%			NK3	5253376
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5245896
Toluene	<0.020	0.020	mg/kg			RSU	5245896
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5245896
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5245896
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5245896
o-Xylene	<0.020	0.020	mg/kg			RSU	5245896
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5245896
(C6-C10)	<12	12	mg/kg			RSU	5245896
1,4-Difluorobenzene (sur.)	101	60 - 140	%			RSU	5245896
4-BROMOFLUOROBENZENE (sur.)	100	60 - 140	%			RSU	5245896
D10-ETHYLBENZENE (sur.)	96	60 - 130	%			RSU	5245896
D4-1,2-DICHLOROETHANE (sur.)	103	60 - 140	%			RSU	5245896
BT1490 PA-19-7							
Sampling Date 2011/10/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	23	0.3	%			TX	5245791
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5253376

Maxxam Job #: B195841
Report Date: 2011/10/17

EGE ENGINEERING LTD.
Client Project #: RCMP-PRINCE ALBERT
Site Location: 190 AIRPORT ROAD, PRINCE ALBERT
Your P.O. #: 0125-036-01
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BT1490 PA-19-7							
Sampling Date 2011/10/03							
Matrix SOIL							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F3 (C16-C34 Hydrocarbons)	44	10	mg/kg			NK3	5253376
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
Reached Baseline at C50	YES		mg/kg			NK3	5253376
O-TERPHENYL (sur.)	89	50 - 130	%			NK3	5253376
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5245896
Toluene	<0.020	0.020	mg/kg			RSU	5245896
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5245896
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5245896
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5245896
o-Xylene	<0.020	0.020	mg/kg			RSU	5245896
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5245896
(C6-C10)	<12	12	mg/kg			RSU	5245896
1,4-Difluorobenzene (sur.)	101	60 - 140	%			RSU	5245896
4-BROMOFLUOROBENZENE (sur.)	99	60 - 140	%			RSU	5245896
D10-ETHYLBENZENE (sur.)	100	60 - 130	%			RSU	5245896
D4-1,2-DICHLOROETHANE (sur.)	106	60 - 140	%			RSU	5245896
BT1491 PA-20-4							
Sampling Date 2011/10/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	12	0.3	%			TX	5245791
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
Reached Baseline at C50	YES		mg/kg			NK3	5253376
O-TERPHENYL (sur.)	86	50 - 130	%			NK3	5253376
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5245896
Toluene	<0.020	0.020	mg/kg			RSU	5245896
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5245896
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5245896
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5245896
o-Xylene	<0.020	0.020	mg/kg			RSU	5245896
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5245896
(C6-C10)	<12	12	mg/kg			RSU	5245896
1,4-Difluorobenzene (sur.)	102	60 - 140	%			RSU	5245896
4-BROMOFLUOROBENZENE (sur.)	98	60 - 140	%			RSU	5245896
D10-ETHYLBENZENE (sur.)	101	60 - 130	%			RSU	5245896
D4-1,2-DICHLOROETHANE (sur.)	104	60 - 140	%			RSU	5245896
BT1492 PA-21-6							
Sampling Date 2011/10/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	17	0.3	%			TX	5245791

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BT1492 PA-21-6							
Sampling Date 2011/10/03							
Matrix SOIL							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
Reached Baseline at C50	YES		mg/kg			NK3	5253376
O-TERPHENYL (sur.)	88	50 - 130	%			NK3	5253376
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	<0.0050	0.0050	mg/kg			RSU	5245896
Toluene	<0.020	0.020	mg/kg			RSU	5245896
Ethylbenzene	<0.010	0.010	mg/kg			RSU	5245896
Xylenes (Total)	<0.040	0.040	mg/kg			RSU	5245896
m & p-Xylene	<0.040	0.040	mg/kg			RSU	5245896
o-Xylene	<0.020	0.020	mg/kg			RSU	5245896
F1 (C6-C10) - BTEX	<12	12	mg/kg			RSU	5245896
(C6-C10)	<12	12	mg/kg			RSU	5245896
1,4-Difluorobenzene (sur.)	102	60 - 140	%			RSU	5245896
4-BROMOFLUOROBENZENE (sur.)	98	60 - 140	%			RSU	5245896
D10-ETHYLBENZENE (sur.)	99	60 - 130	%			RSU	5245896
D4-1,2-DICHLOROETHANE (sur.)	105	60 - 140	%			RSU	5245896
BT1493 PA-BD1							
Sampling Date 2011/10/03							
Matrix SOIL							
RESULTS OF CHEMICAL ANALYSES OF SOIL							
Physical Properties							
Moisture	22	0.3	%			TX	5245791
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	6300	10	mg/kg			NK3	5253376
F3 (C16-C34 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
F4 (C34-C50 Hydrocarbons)	<10	10	mg/kg			NK3	5253376
Reached Baseline at C50	YES		mg/kg			NK3	5253376
O-TERPHENYL (sur.)	88	50 - 130	%			NK3	5253376
VOLATILE ORGANICS BY GC-MS (SOIL)							
Volatiles							
Benzene	0.35	0.0050	mg/kg			RSU	5245896
Toluene	0.35	0.020	mg/kg			RSU	5245896
Ethylbenzene	8.5	0.010	mg/kg			RSU	5245896
Xylenes (Total)	55	0.040	mg/kg			RSU	5245896
m & p-Xylene	37	0.040	mg/kg			RSU	5245896
o-Xylene	18	0.020	mg/kg			RSU	5245896
F1 (C6-C10) - BTEX	1400 (1)	120	mg/kg			RSU	5245896
(C6-C10)	1500 (1)	120	mg/kg			RSU	5245896
1,4-Difluorobenzene (sur.)	107	60 - 140	%			RSU	5245896
4-BROMOFLUOROBENZENE (sur.)	182 (2)	60 - 140	%			RSU	5245896
D10-ETHYLBENZENE (sur.)	105	60 - 130	%			RSU	5245896
D4-1,2-DICHLOROETHANE (sur.)	113	60 - 140	%			RSU	5245896

(1) Detection limit raised due to dilution to bring analyte within the calibrated range.
(2) Please note that the recovery of some compounds are outside control limits however the overall quality control for this analysis meets our acceptability criteria.

Maxxam

Maxxam Job #: B195841
Report Date: 2011/10/17

EGE ENGINEERING LTD.
Client Project #: RCMP-PRINCE ALBERT
Site Location: 190 AIRPORT ROAD, PRINCE ALBERT
Your P.O. #: 0125-036-01
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BT1499 PA-19							
Sampling Date 2011/10/03							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
Dup. F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
Dup. F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
Dup. F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
Reached Baseline at C50	YES		mg/L			JW0	5267717
Dup. Reached Baseline at C50	YES		mg/L			JW0	5267717
O-TERPHENYL (sur.)	97	50 - 130	%			JW0	5267717
Dup. O-TERPHENYL (sur.)	99	50 - 130	%			JW0	5267717
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	12	0.4	ug/L			MJ0	5245830
Toluene	<0.4	0.4	ug/L			MJ0	5245830
Ethylbenzene	<0.4	0.4	ug/L			MJ0	5245830
o-Xylene	<0.4	0.4	ug/L			MJ0	5245830
m & p-Xylene	<0.8	0.8	ug/L			MJ0	5245830
Xylenes (Total)	<0.8	0.8	ug/L			MJ0	5245830
F1 (C6-C10) - BTEX	<100	100	ug/L			MJ0	5245830
(C6-C10)	<100	100	ug/L			MJ0	5245830
1,4-Difluorobenzene (sur.)	119	70 - 130	%			MJ0	5245830
4-BROMOFLUOROBENZENE (sur.)	109	70 - 130	%			MJ0	5245830
D4-1,2-DICHLOROETHANE (sur.)	96	70 - 130	%			MJ0	5245830
BT1509 PA-20							
Sampling Date 2011/10/03							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
Reached Baseline at C50	YES		mg/L			JW0	5267717
O-TERPHENYL (sur.)	97	50 - 130	%			JW0	5267717
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L			MJ0	5245830
Toluene	<0.4	0.4	ug/L			MJ0	5245830
Ethylbenzene	<0.4	0.4	ug/L			MJ0	5245830
o-Xylene	<0.4	0.4	ug/L			MJ0	5245830
m & p-Xylene	<0.8	0.8	ug/L			MJ0	5245830
Xylenes (Total)	<0.8	0.8	ug/L			MJ0	5245830
F1 (C6-C10) - BTEX	<100	100	ug/L			MJ0	5245830
(C6-C10)	<100	100	ug/L			MJ0	5245830
1,4-Difluorobenzene (sur.)	125	70 - 130	%			MJ0	5245830
4-BROMOFLUOROBENZENE (sur.)	89	70 - 130	%			MJ0	5245830
D4-1,2-DICHLOROETHANE (sur.)	95	70 - 130	%			MJ0	5245830
BT1510 PA-21							
Sampling Date 2011/10/03							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717

Maxxam Job #: B195841
Report Date: 2011/10/17

EGE ENGINEERING LTD.
Client Project #: RCMP-PRINCE ALBERT
Site Location: 190 AIRPORT ROAD, PRINCE ALBERT
Your P.O. #: 0125-036-01
Sampler Initials: AP

Sample Details/Parameters	Result	RDL	Units	meq/L	meq %	By	Batch
BT1510 PA-21							
Sampling Date 2011/10/03							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
Reached Baseline at C50	YES		mg/L			JW0	5267717
O-TERPHENYL (sur.)	97	50 - 130	%			JW0	5267717
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	<0.4	0.4	ug/L			MJ0	5245830
Toluene	<0.4	0.4	ug/L			MJ0	5245830
Ethylbenzene	<0.4	0.4	ug/L			MJ0	5245830
o-Xylene	<0.4	0.4	ug/L			MJ0	5245830
m & p-Xylene	<0.8	0.8	ug/L			MJ0	5245830
Xylenes (Total)	<0.8	0.8	ug/L			MJ0	5245830
F1 (C6-C10) - BTEX	<100	100	ug/L			MJ0	5245830
(C6-C10)	<100	100	ug/L			MJ0	5245830
1,4-Difluorobenzene (sur.)	125	70 - 130	%			MJ0	5245830
4-BROMOFLUOROBENZENE (sur.)	103	70 - 130	%			MJ0	5245830
D4-1,2-DICHLOROETHANE (sur.)	97	70 - 130	%			MJ0	5245830
BT1511 PA-BDW2							
Sampling Date 2011/10/03							
Matrix WATER							
PETROLEUM HYDROCARBONS (CCME)							
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
F3 (C16-C34 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
F4 (C34-C50 Hydrocarbons)	<0.1	0.1	mg/L			JW0	5267717
Reached Baseline at C50	YES		mg/L			JW0	5267717
O-TERPHENYL (sur.)	97	50 - 130	%			JW0	5267717
VOLATILE ORGANICS BY GC-MS (WATER)							
Volatiles							
Benzene	13	0.4	ug/L			MJ0	5245830
Toluene	<0.4	0.4	ug/L			MJ0	5245830
Ethylbenzene	<0.4	0.4	ug/L			MJ0	5245830
o-Xylene	<0.4	0.4	ug/L			MJ0	5245830
m & p-Xylene	<0.8	0.8	ug/L			MJ0	5245830
Xylenes (Total)	<0.8	0.8	ug/L			MJ0	5245830
F1 (C6-C10) - BTEX	<100	100	ug/L			MJ0	5245830
(C6-C10)	<100	100	ug/L			MJ0	5245830
1,4-Difluorobenzene (sur.)	120	70 - 130	%			MJ0	5245830
4-BROMOFLUOROBENZENE (sur.)	110	70 - 130	%			MJ0	5245830
D4-1,2-DICHLOROETHANE (sur.)	95	70 - 130	%			MJ0	5245830

Package 1	4.5°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Meq % is based on dissolved calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulphate and chloride

Results relate only to the items tested.

Maxxam

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: RCMP-PRINCE ALBERT
P.O. #: 0125-036-01
Site Location: 190 AIRPORT ROAD, PRINCE ALBERT

Quality Assurance Report

Maxxam Job Number: CB195841

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5245791 TX	RPD	Moisture	2011/10/06	0.6		%	20
5245830 MJ0	Matrix Spike	1,4-Difluorobenzene (sur.)	2011/10/07		106	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/10/07		119	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/10/07		79	%	70 - 130
		Benzene	2011/10/07		82	%	70 - 130
		Toluene	2011/10/07		86	%	70 - 130
		Ethylbenzene	2011/10/07		87	%	70 - 130
		o-Xylene	2011/10/07		81	%	70 - 130
		m & p-Xylene	2011/10/07		80	%	70 - 130
		(C6-C10)	2011/10/07		79	%	70 - 130
	Spiked Blank	1,4-Difluorobenzene (sur.)	2011/10/07		96	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/10/07		119	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/10/07		80	%	70 - 130
		Benzene	2011/10/07		76	%	70 - 130
		Toluene	2011/10/07		80	%	70 - 130
		Ethylbenzene	2011/10/07		81	%	70 - 130
		o-Xylene	2011/10/07		77	%	70 - 130
		m & p-Xylene	2011/10/07		75	%	70 - 130
		(C6-C10)	2011/10/07		73	%	70 - 130
	Method Blank	1,4-Difluorobenzene (sur.)	2011/10/07		125	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2011/10/07		106	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/10/07		98	%	70 - 130
		Benzene	2011/10/07	<0.4		ug/L	
		Toluene	2011/10/07	<0.4		ug/L	
		Ethylbenzene	2011/10/07	<0.4		ug/L	
		o-Xylene	2011/10/07	<0.4		ug/L	
		m & p-Xylene	2011/10/07	<0.8		ug/L	
		Xylenes (Total)	2011/10/07	<0.8		ug/L	
		F1 (C6-C10) - BTEX	2011/10/07	<100		ug/L	
		(C6-C10)	2011/10/07	<100		ug/L	
	RPD	Benzene	2011/10/09	NC		%	40
		Toluene	2011/10/09	NC		%	40
		Ethylbenzene	2011/10/09	NC		%	40
		o-Xylene	2011/10/09	NC		%	40
		m & p-Xylene	2011/10/09	NC		%	40
		Xylenes (Total)	2011/10/09	NC		%	40
		F1 (C6-C10) - BTEX	2011/10/09	NC		%	40
		(C6-C10)	2011/10/09	NC		%	40
5245896 RSU	Matrix Spike						
	[BT1479-01]	1,4-Difluorobenzene (sur.)	2011/10/08		104	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/10/08		184 (1)	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/10/08		102	%	60 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/10/08		100	%	60 - 140
		Benzene	2011/10/08		115	%	60 - 140
		Toluene	2011/10/08		112	%	60 - 140
		Ethylbenzene	2011/10/08		113	%	60 - 140
		m & p-Xylene	2011/10/08		95	%	60 - 140
		o-Xylene	2011/10/08		94	%	60 - 140
		(C6-C10)	2011/10/08		N.C.	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene (sur.)	2011/10/08		99	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/10/08		101	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/10/08		98	%	60 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/10/08		112	%	60 - 140
		Benzene	2011/10/08		95	%	60 - 140
		Toluene	2011/10/08		90	%	60 - 140

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: RCMP-PRINCE ALBERT
P.O. #: 0125-036-01
Site Location: 190 AIRPORT ROAD, PRINCE ALBERT

Quality Assurance Report (Continued)

Maxxam Job Number: CB195841

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5245896 RSU	Spiked Blank	Ethylbenzene	2011/10/08		93	%	60 - 140
		m & p-Xylene	2011/10/08		82	%	60 - 140
		o-Xylene	2011/10/08		84	%	60 - 140
		(C6-C10)	2011/10/08		68	%	60 - 140
	Method Blank	1,4-Difluorobenzene (sur.)	2011/10/08		102	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2011/10/08		100	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2011/10/08		115	%	60 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2011/10/08		106	%	60 - 140
		Benzene	2011/10/08	<0.0050		mg/kg	
		Toluene	2011/10/08	<0.020		mg/kg	
		Ethylbenzene	2011/10/08	<0.010		mg/kg	
		Xylenes (Total)	2011/10/08	<0.040		mg/kg	
		m & p-Xylene	2011/10/08	<0.040		mg/kg	
		o-Xylene	2011/10/08	<0.020		mg/kg	
		F1 (C6-C10) - BTEX	2011/10/08	<12		mg/kg	
		(C6-C10)	2011/10/08	<12		mg/kg	
	RPD [BT1479-01]	Benzene	2011/10/08	31.5		%	50
		Toluene	2011/10/08	24.6		%	50
		Ethylbenzene	2011/10/08	14.0		%	50
		Xylenes (Total)	2011/10/08	11.5		%	50
		m & p-Xylene	2011/10/08	12.1		%	50
		o-Xylene	2011/10/08	10.3		%	50
		F1 (C6-C10) - BTEX	2011/10/08	11.4		%	50
		(C6-C10)	2011/10/08	11.4		%	50
5252429 LZ0	QC Standard	Sieve - Pan	2011/10/13		100	%	96 - 104
		Sieve - #200 (>0.075mm)	2011/10/13		100	%	90 - 110
	RPD	Sieve - Pan	2011/10/13	0.09		%	35
		Sieve - #200 (>0.075mm)	2011/10/13	NC		%	35
5253376 NK3	Matrix Spike	O-TERPHENYL (sur.)	2011/10/12		96	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/10/12		108	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2011/10/12		92	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2011/10/12		102	%	50 - 130
	Spiked Blank	O-TERPHENYL (sur.)	2011/10/12		93	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/10/12		103	%	70 - 130
		F3 (C16-C34 Hydrocarbons)	2011/10/12		88	%	70 - 130
		F4 (C34-C50 Hydrocarbons)	2011/10/12		99	%	70 - 130
	Method Blank	O-TERPHENYL (sur.)	2011/10/12		91	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/10/12	<10		mg/kg	
		F3 (C16-C34 Hydrocarbons)	2011/10/12	<10		mg/kg	
		F4 (C34-C50 Hydrocarbons)	2011/10/12	<10		mg/kg	
	RPD	F2 (C10-C16 Hydrocarbons)	2011/10/12	NC		%	50
		F3 (C16-C34 Hydrocarbons)	2011/10/12	NC		%	50
		F4 (C34-C50 Hydrocarbons)	2011/10/12	NC		%	50
5267717 JW0	Matrix Spike	O-TERPHENYL (sur.)	2011/10/16		96	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/10/16		105	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2011/10/16		91	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2011/10/16		108	%	50 - 130
	Spiked Blank	O-TERPHENYL (sur.)	2011/10/16		96	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/10/16		121	%	70 - 130
		F3 (C16-C34 Hydrocarbons)	2011/10/16		92	%	70 - 130
		F4 (C34-C50 Hydrocarbons)	2011/10/16		117	%	70 - 130
	Method Blank	O-TERPHENYL (sur.)	2011/10/16		96	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2011/10/16	<0.1		mg/L	
		F3 (C16-C34 Hydrocarbons)	2011/10/16	<0.1		mg/L	
		F4 (C34-C50 Hydrocarbons)	2011/10/16	<0.1		mg/L	

EGE ENGINEERING LTD.
Attention: ANDREW PASSALIS
Client Project #: RCMP-PRINCE ALBERT
P.O. #: 0125-036-01
Site Location: 190 AIRPORT ROAD, PRINCE ALBERT

Quality Assurance Report (Continued)

Maxxam Job Number: CB195841

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5267717 JW0	RPD [BT1499-01]	F2 (C10-C16 Hydrocarbons)	2011/10/16	NC		%	40
		F3 (C16-C34 Hydrocarbons)	2011/10/16	NC		%	40
		F4 (C34-C50 Hydrocarbons)	2011/10/16	NC		%	40

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
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 #: B195841

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

Ghayasuddin Khan, M.Sc., B.Ed., P.Chem, Senior Analyst, Water Lab

Janet Gao, Senior Analyst, Organics Department

LUBA SHYMUSHOVSKA, Senior Analyst, Organic Department

===

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

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Chain of Custody A074395

Page: 1 of ___

Company:	Invoice To: EGE ENGINEERING (C/O Report Address ☐)	Report To: (Same as Invoice ☒)	Report Distribution (E-Mail):	REGULATORY GUIDELINES:
Contact:	A. PASSALIS		david.klassen@mts.net	☐ AT1
Address:	511 PEPPERLOAF, WPG		apassalis@mts.net	☒ CCME
	Prov: MB PC:	Prov: PC:		☐ Regulated Drinking Water
Contact #s:	Ph: 791-4938 Cell:	Ph: Cell:		☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:	0125-836-01
Project # / Name:	RCMP-PRINCE ALBERT
Site Location:	190 AIRPORT ROAD, PRINCE ALBERT
Quote #:	
Sampled By:	A. PASSALIS

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 ☐VOCs	☐BTEX F1-F2 ☐BTEX F1-F4	☐ Routine Water ☐ Turb ☐ F	☐ TOC ☐ DOC	Regulated Metals (CCME / AT1) Total	Regulated Metals Dissolved	Mercury ☐ Total ☐ Dissolved	Other Analysis	HOLD - Do not Analyze	# of Containers Submitted
1	PA-18-5		SOIL	11/10/03	X															
2	PA-18-7				X															
3	PA-19-5				X															
4	PA-19-7				X															
5	PA-20-4				X															
6	PA-21-6				X															
7	PA-BD1				X															
8	PA-19		WATER								X									
9	PA-20										X									
10	PA-21										X									
11	PA-BDW1										X									
12																				

Please indicate Filtered, Preserved or Both (F, P, F/P) → F/P

Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
A PASSALIS	11/10/04	1330
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):

Special Instructions:

# of Jars Used & Not Submitted

LAB USE ONLY

Received By:	Date:	Time:	Maxxam Job #: B195841		
Sohail Rajput	11/10/05	09:00	Custody Seal	Temperature	Ice
Lab Comments: JASON BIL	11-10-06	0845	N	5.2, 3.1, 5.1	Y

To: Cynny Hagen
Subject: Fw: MaxJob#: B195841, Att: ANDREW PASSALIS, Prj: RCMP-PRINCE ALBERT

Hi Cynny,

We will need the F2-F4 component on the 4 water samples submitted with this set. There should be 2x250 ambers for each.

Thx
Andrew

Sent from my BlackBerry®

-----Original Message-----
From: PVirk@maxxam.ca
Date: Thu, 13 Oct 2011 22:49:20
To: <andrew.passalis@mymts.net>; <david.klassen@mts.net>
Subject: MaxJob#: B195841, Att: ANDREW PASSALIS, Prj: RCMP-PRINCE ALBERT

Greetings!

Maxxam Analytics thanks you for your submission. Attached you will find your Certificate of Analysis. Should you have any questions or concerns, please contact your Project Manager. We welcome any feedback you would care to share with us. To do so, please contact us at comments@maxxam.ca

Your result File B195841-R2011-10-13_16-31-38_R011.pdf; B195841-R2011-10-13_16-31-38_N001.xls; is attached.

MAXXAM ANALYTICS
4000 19st N.E
Calgary, Alberta T2E 6P8
http://www.maxxam.ca

APPENDIX H

NCSCS SCORING SHEETS

CCME National Classification System for Contaminated Sites (2008, 2010 v 1.2)
Pre-Screening Checklist

	Question	Response (yes / no)	Comment
1.	Are **Radioactive material**, **Bacterial contamination** or **Biological hazards** likely to be present at the site?	No	If yes, do not proceed through the NCSCS. Contact applicable regulatory agency immediately.
2.	Are there **no contamination exceedances** (known or suspected)? Determination of exceedances may be based on: 1) CCME environmental quality guidelines; 2) equivalent provincial guidelines/standards if no CCME guideline exists for a specific chemical in a relevant medium; or 3) toxicity benchmarks derived from the literature for chemicals not covered by CCME or provincial guidelines/standards.	No	If yes (i.e., there are no exceedances), do not proceed through the NCSCS.
3.	Have **partial/incompleted or no environmental site investigations** been conducted for the Site?	No	If yes, do not proceed through the NCSCS.
4.	Is there direct and signficant evidence of **impacts to humans** at the site, or off-site due to migration of contaminants from the site?	No	If yes, automatically rate the site as Class 1, a priority for remediation or risk management, regardless of the total score obtained should one be calculated (e.g., for comparison with other Class 1 sites).
5.	Is there direct and significant evidence of **impacts to ecological receptors** at the site, or off-site due to migration of contaminants from the site?	No	Some low levels of impact to ecological receptors are considered acceptable, particularly on commercial and industrial land uses. However, if ecological effects are considered to be severe, the site may be categorized as Class 1, regardless of the numerical total NCSCS score. For the purpose of application of the NCSCS, effects that would be considered severe include observed effects on survival, growth or reproduction which could threaten the viability of a population of ecological receptors at the site. Other evidence that qualifies as severe adverse effects may be determined based on professional judgement and in consultation with the relevant jurisdiction.
6.	Are there indicators of significant **adverse effects in the exposure zone** (i.e., the zone in which receptors may come into contact with contaminants)? Some examples are as follows: -Hydrocarbon sheen or NAPL in the exposure zone -Severely stressed biota or devoid of biota; -Presence of material at ground surface or sediment with suspected high concentration of contaminants such as ore tailings, sandblasting grit, slag, and coal tar.	Yes	If yes, automatically rate the site as Class 1, a priority for remediation or risk management, regardless of the total score obtained should one be calculated (e.g., for comparison with other Class 1 sites).
7.	Do measured concentrations of volatiles or unexploded ordnances represent an **explosion hazard**?	No	If yes, automatically rate the site as Class 1, a priority for remediation or risk management, and do not continue until the safety risks have been addressed. Consult your jurisdiction's occupational health and safety guidance or legislation on exposive hazards and measurement of lower explosive limits.

If none of the above applies, proceed with the NCSCS scoring.

CCME National Classification System for Contaminated Sites (2008, 2010 v 1.2)
Summary of Site Conditions

Subject Site:	**RCMP Hangar - Prince Albert, Saskatchewan**	
Civic Address: *(or other description of location)*	190 Airport Road, Prince Albert, Saskatchewan	
Site Common Name : *(if applicable)*	RCMP Hangar, Prince Albert, Saskatchewan	
Site Owner or Custodian: *(Organization and Contact Person)*	Royal Canadian Mounted Police	
Legal description *or* metes and bounds:	Lot 2, Block 103, Plan 78PA07887, Surface Parcel No. 133978102. NE 1/4 Section 11, Township 49, Range 26 West of 2nd Meridian. Rectangular lot with dimensions 45.70 m by 97.50 m.	
Approximate Site area:	4,457 m2	
PID(s*)* : *(or Parcel Identification Numbers [PIN] if untitled Crown land)*	DFRP 13377, PR F/266 BU F/262	
Centre of site: *(provide latitude/longitude or UTM coordinates)*	Latitude: Longitude:	53 degrees 49 min 50 secs 107 degrees 02 min 19 secs
	UTM Coordinate:	Northing: 5966611 Easting: 365832
Site Land Use:	Current:	Aircraft hangar
	Proposed:	Same as current
Site Plan	**To delineate the bounds of the Site a site plan MUST be attached. The plan must be drawn to scale indicating the boundaries in relation to well-defined reference points and/or legal descriptions. Delineation of the contamination should also be indicated on the site plan.**	
Provide a brief description of the Site:	The RCMP Hangar is located at 190 Airport Road in the northeast part of the City of Prince Albert, Saskatchewan. The property is 45.70 by 97.50 m with an area of 4,457 m2. The property is occupied by a 980 m2 single-storey hangar building (BU F/262) reportedly constructed in 1973. The building has a slab on grade foundation and is situated in the centre of the site with an asphalt parking area along the south side of the building and an asphalt access road on the west side. A concrete apron is present on the north side of the hangar followed by an asphalt taxiway (Taxiway Bravo). The remaining areas to the south and along the east side of the building are grassed with some deciduous and evergreen trees. A 16 m2 storage shed is also located on the property at the northeast corner of the hangar. Surrounding land use consists of the City of Prince Albert Airport property to the north, east and south (main terminal, runways, taxiways and garage). Directly west of the property is the Prince Albert Shopper (newspaper publisher), an airplane maintenance building (Elite Aero) and an aviation business (National Aviation).	

CCME National Classification System for Contaminated Sites (2008, 2010 v 1.2)
Summary of Site Conditions

Affected media and Contaminants of Potential Concern (COPC):	Free phase hydrocarbon product (LNAPL) has been identified on the property at ten monitoring well locations. LNAPL thickness has ranged from 0.01 m to 0.42 m in the monitoring wells. The total area of the LNAPL plume is estimated at 1,100 m2. Soil impacted with benzene, toluene, and the PHC Fractions F1 and F2 above the guidelines was identified at ten test hole locations. The impacted soil is contained within a coarse grained medium sand layer which is found below the surface soils across the site. The impacted soil is present at depths of between 3.0 and 4.3 m below ground. The total area of impacted soil is esimated at 1,500 m2. Groundwater impacted with benzene, toluene, ethylbenzene and xylenes above the HC-CGDWQ was identified at nine well locations and the total area is estimated at 2,500 m2. Groundwater impacted above the FCSAP FIGQG is limited to only the PHC F2 Fraction and the area of impact is esitmated at 1,500 m2.

Please fill in the "letter" that best describes the level of information available for the site being assessed

Site Letter Grade **C**

If letter grade is F, do not continue, you must have a minimum of a Phase I Environmental Site Assessment or equivalent.

Scoring Completed By:	David Klassen, P.Geo.
Date Scoring Completed:	05-Dec-11

(I) Contaminant Characteristics

RCMP Hangar - Prince Albert, Saskatchewan

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method of Evaluation	Notes
1. Residency Media (replaces physical state)				
Which of the following residency media are known (or strongly suspected) to have one or more exceedances of the applicable CCME guidelines? **yes** = has an exceedance or strongly suspected to have an exceedance **no** = does not have an exceedance or strongly suspected not to have an exceedance		The Phase III ESA reported LNAPL at 10 groundwater monitoring well locations, and soil and groundwater exceedances of the CWS for PHC (F1 and F2 Fractions) and CCME CEQG for BTEX components. Surface water and sediment samples were not collected as part of the Phase III ESA, however, the distance to the nearest surface water is 430 m to the southwest of the property. Local groundwater flow is to the northeast and clean groundwater samples have been obtained between the impacted area and the surface water, therefore, surface water and sediment are not considered to be impacted.	The overall score is calculated by adding the individual scores from each residency media (having one or more exceedance of the most conservative media specific and land-use appropriate CCME guideline). Summary tables of the Canadian Environmental Quality Guidelines for soil, water (aquatic life, non-potable groundwater environments, and agricultural water uses) and sediment are available on the CCME website at http://www.ccme.ca/publications/ceqg_rcqe.html?category_id=124 . For potable groundwater environments, guidelines for Canadian Drinking Water Quality (for comparison with groundwater monitoring data) are available on the Health Canada website at http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/doc_sup-appui/sum_guide-res_recom/index_e.html.	An increasing number of residency media containing chemical exceedances often equates to a greater potential risk due to an increase in the number of potential exposure pathways.
A. Soil	Yes			
Yes No Do Not Know				
B. Groundwater	Yes			
Yes No Do Not Know				
C. Surface water	No			
Yes No Do Not Know				
D. Sediment	No			
Yes No Do Not Know				
"Known" -score	4			
"Potential" - score	---			
2. Chemical Hazard				
What is the relative degree of chemical hazard of the contaminant in the list of hazard rankings proposed by the Federal Contaminated Sites Action Plan (FCSAP)?	High	The hazard ranking for benzene and the PHC F1 Fraction, which are present on the site above the CCME CEQG and CWS, is high.	The relative degree of chemical hazard should be selected based on the most hazardous contaminant known or suspected to be present at the site. The degree of hazard has been defined by the Federal Contaminated Sites Action Plan (FCSAP) and a list of substances with their associated hazard (Low, Medium and High) has been provided as a separate sheet in this file. *See Attached Reference Material for Contaminant Hazard Rankings.*	Hazard as defined in the revised NCS pertains to the physical properties of a chemical which can cause harm. Properties can include toxic potency, propensity to biomagnify, persistence in the environment, etc. Although there is some overlap between hazard and contaminant exceedance factor below, it will not be possible to derive contaminant exceedance factors for many substances which have a designated chemical hazard designation, but don't have a CCME guideline. The purpose of this category is to avoid missing a measure of toxic potential.
High Medium Low Do Not Know				
"Known" -score	8			
"Potential" - score	---			
3. Contaminant Exceedence Factor				
What is the ratio between the measured contaminant concentration and the applicable CCME guidelines (or other "standards")?	Mobile NAPL	Moblie LNAPL is present at the site, and was identified at 10 groundwater monitoring well locations. The total area of LNAPL is estimated at 1,100 m2.	Ranking of contaminant "exceedance" is determined by comparing contaminant concentrations with the *most conservative media-specific and land-use appropriate CCME* environmental quality guidelines. **Ranking should be based on contaminant with greatest exceedance of CCME guidelines.** Ranking of contaminant hazard as high, medium and low is as follows: High = One or more measured contaminant concentration is greater than 100 X appropriate CCME guidelines Medium = One or more measured contaminant concentration is 10 - 99.99 X appropriate CCME guidelines Low = One or more measured contaminant concentration is 1 - 9.99 X appropriate CCME guidelines Mobile NAPL = Contaminant is a non-aqueous phase liquid (i.e., due to its low solubility, it does not dissolve in water, but remains as a separate liquid) and is present at a sufficiently high saturation (i.e., greater than residual NAPL saturation) such that there is significant potential for mobility either downwards or laterally. Other standards may include local background concentration or published toxicity benchmarks. Results of toxicity testing with site samples can be used as an alternative. This approach is only relevant for contaminants that do not biomagnify in the food web, since toxicity tests would not indicate potential effects at higher trophic levels. High = lethality observed. Medium = no lethality, but sub lethal effects observed. Low = neither lethal nor sub lethal effects observed.	In the event that elevated levels of a material with no associated CCME guidelines are present, check provincial and USEPA environmental criteria. Hazard Quotients (sometimes referred to as a screening quotient in risk assessments) refer to the ratio of measured concentration to the concentration believed to be the threshold for toxicity. A similar calculation is used here to determine the contaminant exceedance factor (CEF). Concentrations greater than one times the applicable CCME guideline (i.e., CEF=>1) indicate that risks are possible. Mobile NAPL has the highest associated score (8) because of its highly concentrated nature and potential for increase in the size of the impacted zone.
Mobile NAPL High (>100x) Medium (10x to 100x) Low (1x to 10x) Do Not Know				
"Known" -score	8			
"Potential" - score	---			

CCME National Classification System (2008, 2010 v 1.2)

(I) Contaminant Characteristics

RCMP Hangar - Prince Albert, Saskatchewan

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method of Evaluation	Notes
4. Contaminant Quantity (known or strongly suspected)				
What is the known or strongly suspected quantity of all contaminants? >10 hectare (ha) or 5000 m^3 2 to 10 ha or 1000 to 5000 m^3 <2 ha or 1000 m^3 Do Not Know	2 to 10 ha or 1000 to 5000 m3	The estimated area of impacted soil is 1,500 m2, or 1,800 m3. The estimated area of impacted groundwater is 1,500 m2. The estimated area of LNAPL is 1,100 m2.	Measure or estimate the area or quantity of total contamination (i.e, all contaminants known or strongly suspected to be present on the site). The "Area of Contamination" is defined as the area or volume of contaminated media (soil, sediment, groundwater, surface water) exceeding appropriate environmental criteria.	A larger quantity of a potentially toxic substance can result in a larger frequency of exposure as well as a greater probability of migration, therefore, larger quantities of these substances earn a higher score.
"Known" -score	6			
"Potential" - score	---			
5. Modifying Factors				
Does the chemical fall in the class of persistent chemicals based on its behavior in the environment? Yes No Do Not Know	No	The BTEX compounds and PHC Fractions are not considered persistent chemicals.	Persistent chemicals, e.g., PCBs, chlorinated pesticides etc. either do not degrade or take longer to degrade, and therefore may be available to cause effects for a longer period of time. Canadian Environmental Protection Act (CEPA) classifies a chemical as persistent when it has at least one of the following characteristics: (a) in air, (i) its half-life is equal to or greater than 2 days, or (ii) it is subject to atmospheric transport from its source to a remote area; (b) in water, its half-life is equal to or greater than 182 days; (c) in sediments, its half-life is equal to or greater than 365 days; or (d) in soil, its half-life is equal to or greater than 182 days. This list does not include metals or metalloids, which in their elemental form do not degrade. However metals and metalloids form chemical species in the environment, many of which are not readily bioavailable.	*Examples of Persistent Substances are provided in attached Reference Materials*
Are there contaminants present that could cause damage to utilities and infrastructure, either now or in the future, given their location? Yes No Do Not Know	Yes	The presence of impacted soil and groundwater, as well as LNAPL, has the potential to affect the utilities near the impacted area (electrical).		Some contaminants may react or absorb into underground utilities and infrastructure. For example, organic solvents may degrade some plastics, and salts could cause corrosion of metal.
How many different contaminant classes have representative CCME guideline exceedances? one two to four five or more Do Not Know	two to four	Two classes: volatile petroleum hydrocarbons (BTEX); and light extractable petroleum hydrocarbons (PHC F1 and F2 Fractions).	For the purposes of the revised NCS ranking system, the following chemicals represent distinct chemical "classes": inorganic substances (including metals), volatile petroleum hydrocarbons, light extractable petroleum hydrocarbons, heavy extractable petroleum hydrocarbons, PAHs, phenolic substances, chlorinated hydrocarbons, halogenated methanes, phthalate esters, pesticides.	*Refer to the Reference Material sheet for a list of example substances that fall under the various chemical classes.*
"Known" - Score	4			
"Potential" - Score	---			

Contaminant Characteristic Total

Raw Total Scores- "Known"	30
Raw Total Scores- "Potential"	0
Raw Combined Total Scores	30
Total Score (Raw Combined / 40 * 33)	**24.8**

(II) Migration Potential (Evaluation of contaminant migration pathways)

RCMP Hangar - Prince Albert, Saskatchewan

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
1. Groundwater Movement				
A. Known COPC exceedances and an operable groundwater pathway within and/or beyond the property boundary.				
i) For **potable groundwater environments**, 1) groundwater concentrations exceed background concentrations and 1X the Guideline for Canadian Drinking Water Quality (GCDWQ) or 2) there is known contact of contaminants with groundwater, based on physical evidence of groundwater contamination. For **non-potable environments** (typically urban environments with municipal services), 1) groundwater concentrations exceed 1X the applicable non potable guidelines or modified generic guidelines (which exclude ingestion of drinking water pathway) or 2) there is known contact of contaminants with groundwater, based on physical evidence of groundwater impacts. ii) Same as (i) except the information is not known but <u>strongly suspected</u> based on indirect observations. iii) Meets GCDWQ for **potable environments**; meets non-potable criteria or modified generic criteria (excludes ingestion of drinking water pathway) for **non-potable environments** **or** Absence of groundwater exposure pathway (i.e., there is no aquifer (see definition at right) at the site or there is an adequate isolating layer between the aquifer and the contamination, and within 5 km of the site there are no aquatic receiving environments and the groundwater does not daylight). Score	12 9 0 12 12	Groundwater samples were collected from 16 of the 25 monitoring wells during the Phase III ESA (the remaining wells had LNAPL and were not sampled). Exceedances of the HC-GCDWQ were noted for benzene, toluene, ethylbenzene, and xylenes and the FCSAP FIGQG was exceeded for the PHC F2 Fraction. LNAPL is also present on-site. The maximum score of 12 is assigned.	Review chemical data and evaluate groundwater quality. The evaluation method concentrates on 1) a potable or non-potable groundwater environment; 2) the groundwater flow system and its potential to be an exposure pathway to known or potential receptors. An aquifer is defined as a geologic unit that yields groundwater in usable quantities and drinking water quality. The aquifer can currently be used as a potable water supply or could have the potential for use in the future. Non-potable groundwater environments are defined as areas that are serviced with a reliable alternative water supply (most commonly provided in urban areas). The evaluation of a non-potable environment will be based on a site specific basis. Physical evidence includes significant sheens, liquid phase contamination, or contaminant saturated soils. Seeps and springs are considered part of the groundwater pathway. In Arctic environments, the potability and evaluation of the seasonal active layer (above the permafrost) as a groundwater exposure pathway will be considered on a site-specific basis.	The 1992 NCS rationale evaluated the off-site migration as a regulatory issue. The exposure assessment and classification of hazards should be evaluated regardless of the property boundaries. Someone experienced must provide a thorough description of the sources researched to determine the presence/absence of a groundwater supply source in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps/reports and other resources such as internet links. Note that for potable groundwater that also daylights into a nearby surface water body, the more stringent guidelines for both drinking water and protection of aquatic life should be considered. **Selected References** <u>Potable Environments</u> Guidelines for Canadian Drinking Water Quality <u>www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/doc_sup-appui/sum_guide-res_recom/index_e.html</u> <u>Non-Potable Environments</u> Canadian Water Quality Guidelines for Protection of Aquatic Life. CCME. 1999 <u>www.ccme.ca</u> Compilation and Review of Canadian Remediation Guidelines, Standards and Regulations. Science Applications International Corporation (SAIC Canada), report to Environment Canada, January 4, 2002.
NOTE: If a score is assigned here for Known COPC Exceedances, then you can skip Part B (Potential for groundwater pathway) and go to Section 2 (Surface Water Pathway)				
B. Potential for groundwater pathway.				
a. Relative Mobility High Moderate Low Insignificant Do Not Know Score	Do Not Know 2	N/A	Organics Koc (L/kg) / Metals with higher mobility at acidic conditions / Metals with higher mobility at alkaline conditions Koc < 500 (i.e., log Koc < 2.7) / pH < 5 / pH > 8.5 Koc = 500 to 5000 (i.e., log Koc = 2.7 to 3.7) / pH = 5 to 6 / pH = 7.5 to 8.5 Koc = 5,000 to 100,000 (i.e., log Koc = 3.7 to 5) / pH > 6 / pH < 7.5 Koc > 100,000 (i.e., log Koc > 5)	Reference: US EPA Soil Screening Guidance (Part 5 - Table 39) If a score of zero is assigned for relative mobility, it is still recommended that the following sections on potential for groundwater pathway be evaluated and scored. Although the Koc of an individual contaminant may suggest that it will be relatively immobile, it is possible that, with complex mixtures, there could be enhanced mobility due to co-solvent effects. Therefore, the Koc cannot be relied on solely as a measure of mobility. An evaluation of other factors such as containment, thickness of confining layer, hydraulic conductivities and precipitation infiltration rate are still useful in predicting potential for groundwater migration, even if a contaminant is expected to have insignificant mobility based on its chemistry alone.
b. Presence of engineered sub-surface containment? No containment Partial containment Full containment Do Not Know Score	Do Not Know 1.5	N/A	Review the existing engineered systems or natural attenuation processes for the site and determine if full or partial containment is achieved. Full containment is defined as an engineered system or natural attenuation processes, monitored as being effective, which provide for full capture and/or treatment of contaminants. All chemicals of concern must be contained for "Full Containment" scoring. Natural attenuation must have sufficient data, and reports cited with monitoring data to support steady state conditions and the attenuation processes. If there is no containment or insufficient natural attenuation process, this category is evaluated as high. If there is less than full containment or if uncertain, then evaluate as medium. In Arctic environments, permafrost will be evaluated, as appropriate, based on detailed evaluations, effectiveness and reliability to contain/control contaminant migration.	Someone experienced must provide a thorough description of the sources researched to determine the containment of the source at the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps, geotechnical reports or natural attenuation studies and other resources such as internet links. **Selected Resources:** United States Environmental Protection Agency (USEPA) 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater. EPA/600/R-98/128 Environment Canada – Ontario Region – Natural Attenuation Technical Assistance Bulletins (TABS) Number 19 –21.
c. Thickness of confining layer over aquifer of concern or groundwater exposure pathway 3 m or less including no confining layer or discontinuous confining layer 3 to 10 m > 10 m Do Not Know Score	Do Not Know 0.5	N/A	The term "confining layer" refers to geologic material with little or no permeability or hydraulic conductivity (such as unfractured clay); water does not pass through this layer or the rate of movement is extremely slow. Measure the thickness and extent of materials that will impede the migration of contaminants to the groundwater exposure pathway. The evaluation of this category is based on: 1) The presence and thickness of saturated subsurface materials that impede the vertical migration of contaminants to lower aquifer units which can or are used as drinking water sources or 2) The presence and thickness of unsaturated subsurface materials that impede the vertical migration of contaminants from the source location to the saturated zone (e.g., water table aquifer, first hydrostratigraphic unit or other groundwater pathway).	
d. Hydraulic conductivity of confining layer $>10^{-4}$ cm/s or no confining layer 10^{-4} to 10^{-6} cm/s $<10^{-6}$ cm/s Do Not Know Score	Do Not Know 0.5	N/A	Determine the nature of geologic materials and estimate hydraulic conductivity from published material (or use "Range of Values of Hydraulic Conductivity and Permeability" figure in the Reference Material sheet). Unfractured clays should be scored low. Silts should be scored medium. Sand, gravel should be scored high. The evaluation of this category is based on: 1) The presence and hydraulic conductivity ("K") of saturated subsurface materials that impede the vertical migration of contaminants to lower aquifer units which can or are used as a drinking water source, groundwater exposure pathway or 2) The presence and permeability ("k") of unsaturated subsurface materials that impede the vertical migration of contaminants from the source location to the saturated water table aquifer, first hydrostratigraphic unit or other groundwater pathway.	

(II) Migration Potential (Evaluation of contaminant migration pathways)

RCMP Hangar - Prince Albert, Saskatchewan

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
B. Potential for groundwater pathway.				
e. Precipitation infiltration rate (Annual precipitation factor x surface soil relative permeability factor) High Moderate Low Very Low None Do Not Know Score	Do Not Know 0.4	N/A	Precipitation Refer to Environment Canada precipitation records for relevant areas. Divide annual precipitation by 1000 and round to nearest tenth (e.g., 667 mm = 0.7 score). Permeability For surface soil relative permeability (i.e., infiltration) assume: gravel (1), sand (0.6), loam (0.3) and pavement or clay (0). Multiply the surface soil relative permeability factor with precipitation factor to obtain the score for precipitation infiltration rate.	
f. Hydraulic conductivity of aquifer $>10^{-2}$ cm/s 10^{-2} to 10^{-4} cm/s $<10^{-4}$ cm/s Do Not Know Score	Do Not Know 1	N/A	Determine the nature of geologic materials and estimate hydraulic conductivity of all aquifers of concern from published material (refer to "Range of Values of Hydraulic Conductivity and Permeability" in the Reference Material sheet).	
Potential groundwater pathway total	5.9			
Allowed Potential score	---	Note: If a "known" score is provided, the "potential" score is disallowed.		
Groundwater pathway total	**12**			
2. Surface Water Movement				
A. Demonstrated migration of COPC in surface water above background conditions				
Known concentrations of surface water: i) Concentrations exceed background concentrations and exceed CCME CWQG for protection of aquatic life, irrigation, livestock water, and/or recreation (whichever uses are applicable at the site) by >1 X; or There is known contact of contaminants with surface water based on site observations. or In the absence of CWQG, chemicals have been proven to be toxic based on site specific testing (e.g. toxicity testing; or other indicator testing of exposure).	12	Surface water was not investigated during the Phase III ESA. Based on the distance from the impacted area to the surface water (North Saskatchewan River), measured at 430 m, and the local groundwater flow direction, which is away from the water body, and the presence of groundwater monitoring points between the impacted area and the surface water body that do not have exceedances, there is no evidence that COPC migration is occuring that could affect surface water. The potential is assessed.	Collect all available information on quality of surface water near to site. Evaluate available data against Canadian Water Quality Guidelines (select appropriate guidelines based on local water use, e.g., recreation, irrigation, aquatic life, livestock watering, etc.). The evaluation method concentrates on the surface water flow system and its potential to be an exposure pathway. Contamination is present on the surface (above ground) and has the potential to impact surface water bodies. Surface water is defined as a water body that supports one of the following uses: recreation, irrigation, livestock watering, aquatic life.	General Notes: Someone experienced must provide a thorough description of the sources researched to classify the surface water body in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps/reports and other resource such as internet links. Selected References: CCME. 1999. Canadian Water Quality Guidelines for the Protection of Aquatic Life www.ccme.ca CCME. 1999. Canadian Water Quality Guidelines for the Protection of Agricultural Water Uses (Irrigation and Livestock Water) www.ccme.ca Health and Welfare Canada. 1992. Guidelines for Canadian Recreational Water Quality.
ii) Same as (i) except the information is not known but strongly suspected based on indirect observations.	8			
iii) Meets CWQG or absence of surface water exposure pathway (i.e., Distance to nearest surface water is > 5 km.)	0			
Score	Go to Potential ---			
NOTE: If a score is assigned here for Demonstrated Migration in Surface Water, then you can skip Part B (Potential for migration of COPCs in surface water) and go to Section 3 (Surface Soils)				
B. Potential for migration of COPCs in surface water				
a. Presence of containment No containment Partial containment Full containment Do Not Know Score	Partial containment 3	The impacted soil and groundwater, and the presence of LNAPL, is found between 3.0 and 4.3 m below ground. There is partial containment below the impacted area based on the presence of fine grained silty clay soil. Local groundwater flow in the shallow subsurface soil is to the northeast, away from the nearby surface water, located to the southwest. A small area of shallow impacted soil is present near the fuel dispensing stand.	Review the existing engineered systems and relate these structures to site conditions and proximity to surface water and determine if full containment is achieved: score low if there is full containment such as capping, berms, dikes; score medium if there is partial containment such as natural barriers, trees, ditches, sedimentation ponds; score high if there are no intervening barriers between the site and nearby surface water. Full containment must include containment of all chemicals.	
b. Distance to Surface Water 0 to <100 m 100 - 300 m >300 m Do Not Know Score	>300 m 0.5	The nearest surface water body is the North Saskatchewan River, located 430 m to the southwest of the impacted area.	Review available mapping and survey data to determine distance to nearest surface water bodies.	
c. Topography Contaminants above ground level and slope is steep Contaminants at or below ground level and slope is steep Contaminants above ground level and slope is intermediate Contaminants at or below ground level and slope is intermediate Contaminants above ground level and slope is flat Contaminants at or below ground level and slope is flat Do Not Know Score	At/below and flat 0	The contaminants are present below ground and the topography is relatively flat.	Review engineering documents on the topography of the site and the slope of surrounding terrain. Steep slope = >50% Intermediate slope = between 5 and 50% Flat slope = < 5% Note: Type of fill placement (e.g., trench, above ground, etc.).	

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
d. Run-off potential High (rainfall run-off score > 0.6) Moderate (0.4 < rainfall run-off score <0.6) Low (0.2 < rainfall run-off score <0.4) Very Low (0 < rainfall run-off score < 0.2) None (rainfall run-off score = 0) Do Not Know Score	Low 0.4	Environment Canada precipitation records for Prince Albert indicate average annual rainfall of 323.7 mm. Rounding off and dividing by 1000 = 0.3 score. For infiltration, the surface soils are predominantly silt. A score of 0.6 is assigned. Multiplying 0.3 x 0.6 = 0.18, or rounding off, 0.2. A score of low is assigned.	Rainfall Refer to Environment Canada precipitation records for relevant areas. Divide rainfall by 1000 and round to nearest tenth (e.g., 667 mm = 0.7 score). The former definition of "annual rainfall" did not include the precipitation as snow. This minor adjustment has been made. The second modification was the inclusion of permeability of surface materials as an evaluation factor. Permeability For infiltration assume: gravel (0), sand (0.3), loam (0.6) and pavement or clay (1). Multiply the infiltration factor with precipitation factor to obtain rainfall run off score.	Selected Sources: Environment Canada web page link www.msc.ec.gc.ca Snow to rainfall conversion apply ratio of 15 (snow):1(water)
e. Flood potentia 1 in 2 years 1 in 10 years 1 in 50 years Not in floodplair Do Not Know Score	Not in floodplain 0	No records of flooding at the RCMP Hangar were identified. The property is not at risk of flooding.	Review published data such as flood plain mapping or flood potential (e.g., spring or mountain run-off) and Conservation Authority records to evaluate flood potential of nearby water courses both up and down gradient. Rate zero if site not in flood plain.	
Potential surface water pathway total Allowed Potential score **Surface water pathway total**	3.9 3.9 **3.9**	Note: If a "known" score is provided, the "potential" score is disallowed.		
3. Surface Soils (potential for dust, dermal and ingestion exposure)				
A. Demonstrated concentrations of COPC in surface soils (top 1.5 m)				
COPCs measured in surface soils exceed the CCME soil quality guideline. Strongly suspected that soils exceed guidelines COPCs in surface soils does not exceed the CCME soil quality guideline or is not present (i.e., bedrock). Score	12 9 0 12 12	There were three surface soil exceedances reported in the UST Piping Repair report (KGS, 2010) over an area of about 1.5 m2. The majority of the impacted soil, groundwater and the LNAPL identified in the Phase III ESA are present at depths of 3.0 m below ground and lower. A maximum score of 12 is assigned.	Collect all available information on quality of surface soils (i.e., top 1.5 metres) at the site. Evaluate available data against Canadian Soil Quality Guidelines. Select appropriate guidelines based on current (or proposed future) land use (i.e, agricultural, residential/parkland, commercial, or industrial) and soil texture if applicable (i.e., coarse or fine).	Selected References: CCME. 1999. Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health www.ccme.ca
NOTE: If a score is assigned here for Demonstrated Concentrations in Surface Soils, then you can skip Part B (Potential for a surface soils migration pathway) and go to Section 4 (Vapour)				
B. Potential for a surface soils (top 1.5 m) migration pathway				
a. Are the soils in question covered? Exposed Vegetated Landscaped Paved Do Not Know Score	Do Not Know 4	N/A	Consult engineering or risk assessment reports for the site. Alternatively, review photographs or perform a site visit. Landscaped surface soils must include a minimum of 0.5 m of topsoil.	The possibility of contaminants in blowing snow have not been included in the revised NCS as it is difficult to assess what constitutes an unacceptable concentration and secondly, spills to snow or ice are most efficiently mitigated while freezing conditions remain.
b. For what proportion of the year does the site remain covered by snow? 0 to 10% of the year 10 to 30% of the year More than 30% of the year Do Not Know Score	Do Not Know 3	N/A	Consult climatic information for the site. The increments represent the full span from soils which are always wet or covered with snow (and therefore less likely to generate dust) to those soils which are predominantly dry and not covered by snow (and therefore are more likely to generate dust).	
Potential surface soil pathway total Allowed Potential score **Soil pathway total**	7 --- **12**	**Note: If a "known" score is provided, the "potential" score is disallowed**		
4. Vapour				
A. Demonstrated COPCs in vapour.				
Vapour has been measured (indoor or outdoor) in concentrations exceeding risk based concentrations. Strongly suspected (based on observations and/or modelling) Vapour has not been measured and volatile hydrocarbons have not been found in site soils or groundwater. Score	12 9 0 12 12	The presence of combustible vapours at concentrations between 1% and 32% of the lower explosive limit were noted on the property, as well as the presence of NAPL. These vapours are present in the subsoils close to and below the RCMP Hangar building. A risk assessment has not been completed, however, the potential for vapours to exceed risk based concentrations is present. A maximum score of 12 is assigned.	Consult previous investigations, including human health risk assessments, for reports of vapours detected.	
NOTE: If a score is assigned here for Demonstrated COPCs in Vapour, then you can skip Part B (Potential for COPCs in vapour) and go to Section 5 (Sediment)				
B. Potential for COPCs in vapour				
a. Relative Volatility based on Henry's Law Constant, H' (dimensionless) High (H' > 1.0E-1) Moderate (H' = 1.0E-1 to 1.0E-3 Low (H' < 1.0E-3) Not Volatile Do Not Know Score	Do Not Know 2.5	N/A	Reference: US EPA Soil Screening Guidance (Part 5 - Table 36) *Provided in Attached Reference Materials*	If the Henry's Law Constant for a substance indicates that it is not volatile, and a score of zero is assigned here for relative volatility, then the other three questions in this section on Potential for COPCs will be automatically assigned scores of zero and you can skip to section 5.

CCME National Classification System (2008, 2010 v 1.2)

(II) Migration Potential (Evaluation of contaminant migration pathways)

RCMP Hangar - Prince Albert, Saskatchewan

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
b. What is the soil grain size? Fine / Coarse / Do Not Know	Do Not Know	N/A	Review soil permeability data in engineering reports. The greater the permeability of soils, the greater the possible movement of vapours. Fine-grained soils are defined as those which contain greater than 50% by mass particles less than µm mean diameter (D50 < 75 µm). Coarse-grained soils are defined as those which contain greater than 50% by mass particles greater than 75 µm mean diameter (D50 > 75 µm).	
Score	3			
c. Is the depth to the source less than 10m? Yes / No / Do Not Know	Do Not Know	N/A	Review groundwater depths below grade for the site.	
Score	1			
d. Are there any preferential pathways? Yes / No / Do Not Know	Do Not Know	N/A	Visit the site during dry summer conditions and/or review available photographs. Where bedrock is present, fractures would likely act as preferential pathways.	Preferential pathways refer to areas where vapour migration is more likely to occur because there is lower resistance to flow than in the surrounding materials. For example, undergrou conduits such as sewer and utility lines, drains, or septic systems may serve as preferential pathways. Features of the building itself that may also be preferential pathways include earthen floors, expansion joints, wall cracks, or foundation perforations for subsurface features such as utility pipes, sumps, and drains.
Score	1			
Potential vapour pathway total	7.5			
Allowed Potential score	---	Note: If a "known" score is provided, the "potential" score is disallowed.		
Vapour pathway total	**12**			
5. Sediment Movement				
A. Demonstrated migration of sediments containing COPCs				
There is evidence to suggest that sediments originally deposited to the site (exceeding the CCME sediment quality guidelines) have migrated.	12		Review sediment assessment reports. Evidence of migration of contaminants in sediments must be reported by someone experienced in this area.	Usually not considered a significant concern in lakes/marine environments, but could be very important in rivers where transport downstream could be significant.
Strongly suspected (based on observations and/or modelling)	9			
Sediments have been contained and there is no indication that sediments will migrate in future. **or** Absence of sediment exposure pathway (i.e., within 5 km of the site there are no aquatic receiving environments, and therefore no sediments).	0	Aquatic receiving environments are present within 5 km of the site (430 m from the impacted area). The local groundwater flow is in the opposite direction of the aquatic environment, and groundwater wells between the impacted area and the aqautic environment did not indicate any exceedances. A score of 0 is assigned.		
	0			
Score	0			
NOTE: If a score is assigned here for Demonstrated Migration of Sediments, then you can skip Part B (Potential for Sediment Migration) and go to Section 6 (Modifying Factors)				
B. Potential for sediment migration		N/A		
a. Are the sediments having COPC exceedances capped with sediments having no exceedances ("clean sediments")? Yes / No / Do Not Know	Do Not Know		Review existing sediment assessments. If sediment coring has been completed, it may indicate that historically contaminated sediments have been covered over by newer "clean" sediments. This assessment will require that cores collected demonstrate a low concentration near the top and higher concentration with sediment depth.	
	2			
b. For lakes and marine habitats, are the contaminated sediments in shallow water and therefore likely to be affected by tidal action, wave action or propeller wash? Yes / No / Do Not Know	Do Not Know		Review existing sediment assessments. If the sediments present at the site are in a river, select "no" for this question.	
	2			
c. For rivers, are the contaminated sediments in an area prone t sediment scouring? Yes / No / Do Not Know	Do Not Know		Review existing sediment assessments. It is important that the assessment is made under worst case flows (high yearly flows). Under high yearly flows, areas which are commonly depositional may	
	2			
Potential sediment pathway total	6			
Allowed Potential score	---	Note: If a "known" score is provided, the "potential" score is disallowed.		
Sediment pathway total	**0**			
6. Modifying Factors				
Are there subsurface utility conduits in the area affected by contamination? Yes / No / Do Not Know	Yes	There are electrical utility conduits that pass through the impacted area.	Consult existing engineering reports. Subsurface utilities can act as conduits for contaminant migration.	
Known	4			
Potential	0			

Migration Potential Total

Raw "known" total	40	
Raw "potential" total	3.9	
Raw combined total	43.9	Note: If "Known" and "Potential" scores are provided, the checklist defaults to known. Therefore, the total "Potential" Score may not reflect the sum of the individual "Potential" scores.
Total (max 33)	**22.6**	

CCME National Classification System (2008, 2010 v 1.2)

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

RCMP Hangar - Prince Albert, Saskatchewan

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
1. Human				
A. Known exposure				
Documented adverse impact or high quantified exposure which has or will result in an adverse effect, injury or harm or impairment of the safety to humans as a result of the contaminated site. (Class 1 Site*) Same as above, but "Strongly Suspected" based on observations or indirect evidence. No quantified or suspected exposures/impacts in humans. Score	22 10 0 Go to Potential ---	The impacted soil , groundwater and LNAPL is located about 3.0 m below ground and there is no direct exposure pathway for humans. A small area of impacted soil is located in the upper 1.5 m near the fuel dispensing stand. Th presence of LNAPL at the site automatically ranks the site as a Class 1, however, the scoring is completed on the basis of potential exposure in order to compare with other Class 1 sites.	*Where adverse effects on humans are documented, the site should be automatically designated as a Class 1 site (i.e., action required). There is no need to proceed through the NCS in this case. However, a scoring guideline (22) is provided in case a numerical score for the site is still desired (e.g., for comparison with other Class 1 sites). This category can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients >1 for noncarcinogenic chemicals and incremental cancer risks that exceed acceptable levels defined by the jurisdiction for carcinogenic chemicals (for most jurisdictions this is typically either $>10^{5}$ or $>10^{-6}$). Known impacts can also be evaluated based on blood testing (e.g. blood lead >10 ug/dL) or other health based testing. This category can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients of less than 0.2 for non-carcinogenic chemicals and incremental lifetime cancer risks for carcinogenic chemicals that are within acceptable levels as defined by the jurisdictio (for most jurisdictions this is less than either 10^{6} or 10^{-5}).	Known adverse impact includes domestic and traditional food sources. Adverse effects based on food chain transfer to humans and/or animals can be scored in this category. However, the weight of evidence must show a direct link of a contaminated food source/supply and subsequent ingestion/transfer to humans. Any associated adverse effects to the environment are scored separately later in this worksheet. Someone experienced must provide a thorough description of the sources researched to evaluate and determine the quantified exposure/impact (adverse effect) in the vicinity of the contaminated site. **Selected References:** Health Canada – Federal Contaminated Site Risk Assessment in Canada Parts 1 and 2 Guidance on Human Heath Screening Level Risk Assessments (www.hc-sc.gc.ca/ewh-semt/pubs/contamsite/index_e.html) United States Environmental Protection Agency, Integrated Risk Information System (IRIS) - http://toxnet.nml.nih.gov
NOTE: If a score is assigned here for Known Exposure, then you can skip Part B (Potential for Human Exposure) and go to Section 2 (Human Exposure Modifying Factors)				
B. Potential for human exposure				
a) Land use (provides an indication of potential human exposure scenarios) Agricultural Residential / Parkland Commercial Industrial Do Not Know Score	Commercial 1	The property is considered commercial as the public has limited access to the site, but is not resident on the property. The staff at the location spend approximately 8 -10 hours on-site per day.	Review zoning and land use maps over the distances indicated. If the proposed future land use is more "sensitive" than the current land use, evaluate this factor assuming the proposed future use is in place. Agricultural land use is defined as uses of land where the activities are related to the productive capability of the land or facility (e.g., greenhouse) and are agricultural in nature, or activities related to the feeding and housing of animals as livestock. Residential/Parkland land uses are defined as uses of land on which dwelling on a permanent, temporary, or seasonal basis is the activity (residential), as well as uses on which the activities are recreational in nature and require the natural or human designed capability of the land to sustain that activity (parkland). Commercial/Industrial land uses are defined as land on which the activities are related to the buying, selling, or trading of merchandise or services (commercial), as well as land uses which are related to the production, manufacture, or storage of materials (industrial).	This is the main "receptor" factor used in site scoring. A higher score implies a greater exposure and/or exposure of more sensitive human receptors (e.g., children).
b. Indicate the level of accessibility to the contaminated portion of the site (e.g., the potential for coming in contact with contamination) Limited barriers to prevent site access; contamination not covered Moderate access or no intervening barriers, contaminants are covered. Remote locations in which contaminants not covered. Controlled access or remote location and contaminants are covered Do Not Know Score	Controlled or remote 0	The impacted soil, groundwater, and the LNAPL are present below the surface with no direct access, and are considered controlled and covered. A small area (1.5 m2) of impacted soil is present in the upper 1.5 m near the fuel dispensing stand.	Review location and structures and contaminants at the site and determine if there are intervening barriers between the site and humans. A low rating should be assigned to a (covered) site surrounded by a fence or in a remote location, whereas a high score should be assigned to a site th has no cover, fence, natural barriers or buffer.	
B. Potential for human exposure				
c) Potential for intake of contaminated soil, water, sediment or foods for operable or potentially operable pathways, as identified in Worksheet II (Migration Potential). i) direct contact Is dermal contact with contaminated surface water, groundwater, sediments or soils anticipated? Yes No Do Not Know Score	Yes 3	Direct contact (dermal) with the majority of the impacted soil and groundwater is not possible based on the location of the contaminants below the surface, however, a small area (1.5 m2) of shallow impacted soil is present near the fuel dispensing stand.	If soils or potable groundwater are present exceeding their respective CCME guidelines, dermal contact is assumed. Exposure to surface water, non-potable groundwater or sediments exceeding their respective CCME guidelines will depend on the site. Select "Yes" if dermal exposure to surface water, non-potable groundwater or sediments is expected. For instance, dermal contact with sediments would not be expected in an active port. Only soils in the top 1.5 m are defined by CCME (2003) as surface soils. If contaminated soils are only located deeper than 1.5 m, direct contact with soils is not anticipated to be an operable contaminant exposure pathway.	Exposure via the skin is generally believed to be a minor exposure route. However for some organic contaminants, skin exposure can play a very important component of overall exposure. Dermal exposure can occur while swimming in contaminated waters, bathing with contaminated surface water/groundwater and digging in contaminated dirt, etc.
ii) inhalation (i.e., inhalation of dust, vapour) Vapour - Are there inhabitable buildings on the site within 30 m of soils or groundwater with volatile contamination as determined in Worksheet II (Migration Potential)? Yes No Do Not Know Score Dust - If there is contaminated surface soil (e.g. top 1.5 m) , indicate whether the soil is fine or coarse textured. If it is known that surfac soil is not contaminated, enter a score of zero. Fine Coarse Surface soil is not contaminated or absent (bedrock) Do Not Know Texture Score inhalation total	Yes 3 Fine 3 6	An inhabitated building (during working hours) is present on the site and located within 30 m of the impacted area containing volatile contaminants. A maximum score of 3 is assigned. The small area of fine grained surface soil (above 1.5 m) is impacted.	If inhabitable buildings are on the site within 30 m of soils or groundwater exceeding their respective guidelines for volatile chemicals, there is a potential of risk to human health (Health Canada, 2004). Review site investigations for location of soil samples (having exceedances of volatile substances) relative to buildings. Refer to (II) Migration Potential worksheet, 4B.a) *Potential for COPCs in Vapour* for a definition of volatility. Consult grain size data for the site. If soils (containing exceedances of the CCME soil quality guidelines) predominantly consist of fine material (having a median grain size of 75 microns; as defined by CCME (2006)) then these soils are more likely to generate dusts.	Exposure via the lungs (inhalation) can be a very important exposure pathway. Inhalation can be via both particulates (dust) and gas (vapours). Vapours can be a problem where buildings have been built on former industrial sites or where volatile contaminants have migrated below buildings resulting in the potential for vapour intrusion. Assesses the potential for humans to be exposed to vapours originating from site soils. The closer the receptor is to a source of volatile chemicals in soil, the greater the potential of exposure. Also, coarser-grained soil will convey vapour much more efficiently in the soil than finer grained material such as clays and silts. General Notes; Someone experienced must provide a thorough description of the sources researched to determine the presence/absence of a vapour migration and/or dust generation in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including conta names, phone numbers, e-mail correspondence and/or reference maps/reports and other resource such as internet links. Selected References; Canadian Council of Ministers of the Environment (CCME). 2006. Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines. PN 1332 www.ccme.ca Golder, 2004. Soil Vapour Intrusion Guidance for Health Canada Screening Level Risk Assessment (SLRA) Submitted to Health Canada, Burnaby, BC

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

RCMP Hangar - Prince Albert, Saskatchewan

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
B. Potential for human exposure				
iii) Ingestion (i.e., ingestion of food items, water and soils [for children]), including traditional foods. Drinking Water: Choose a score based on the proximity to a drinking water supply, to indicate the potential for contamination (present or future). 0 to 100 m 100 to 300 m 300 m to 1 km 1 to 5 km No drinking water present Do Not Know	300 m to 1 km	Groundwater wells are not located on the property, but are found within 1.0 km of the site. The North Saskatchewan River is used as the source of water for the City of Prince Albert, and is located 430 m from the site.	Review available site data to determine if drinking water (groundwater, surface water, private, commercial or municipal supply) is known or suspected to be contaminated above Guidelines for Canadian Drinking Water Quality. If drinking water supply is known to be contaminated, some immediate action (e.g., provision of alternate drinking water supply) should be initiated to reduce or eliminate exposure. The evaluation of significant potential for exceedances of the water supply in the future may be based on the capture zones of the drinking water wells; contaminant travel times; computer modelling of flow and contaminant transport.	**Selected References:** Guidelines for Canadian Drinking Water Quality www.hc-sc.gc.ca/hecs-sesc/water/publications/drinking_water_quality_guidelines/toc.htm Drinking water can be an extremely important exposure pathway to humans. If site groundwater or surface water is not used for drinking, then this pathway is considered to be inoperable. Consider both wild foods such as salmon, venison, caribou, as well as agricultural sources of food items if the contaminated site is on or adjacent to agricultural land uses.
Score	2			
Is an alternative water supply readily available? Yes No Do Not Know	Yes	Bottled or trucked water is available.		
Score	0			
Is human ingestion of contaminated soils possible? Yes No Do Not Know	Yes	Contaminated soils are mainly present at 3.0 m below ground or lower, and human ingestion is not considered possible for these soils. A small area (1.5 m2) of shallow impacted soil is present near the fuel dispensing stand and ingestion is possible.	If contaminated soils are located within the top 1.5 m, it is assumed that ingestion of soils is an operable exposure pathway. Exposure to soils deeper than 1.5 m is possible, but less likely, and the duration is shorter. Refer to human health risk assessment reports for the site in question.	
Score	3			
Are food items consumed by people, such as plants, domestic animals or wildlife harvested from the contaminated land and its surroundings? Yes No Do Not Know	No	There are no food items harvested from the impacted area or its surroundings.	Use human health risk assessment reports (or others) to determine if there is significant reliance on traditional food sources associated with the site. Is the food item in question going to spend a large proportion of its time at the site (e.g., large mammals may spend a very small amount of time at a small contaminated site)? Human health risk assessment reports for the site in question will also provide information on potential bioaccumulation of the COPC in question.	
Score	0			
Ingestion total	5			
Human Health Total "Potential" Score	15	Note if a "Known" Human Health score is provided, the "Potential" score is disallowed.		
Allowed "Potential" Score	15			
2. Human Exposure Modifying Factors				
a) Strong reliance of local people on natural resources for survival (i.e., food, water, shelter, etc.) Yes No Do Not Know	No	Local people are not dependant on natural resources for survival.		
Known	0			
Potential	---			
Raw Human "known" total	0			
Raw Human "potential" total	15			
Raw Human Exposure Total Score	15			
Human Health Total (max 22)	**15.0**			
3. Ecological				
A. Known exposure				
Documented adverse impact or high quantified exposure which has or will result in an adverse effect, injury or harm or impairment of the safety to terrestrial or aquatic organisms as a result of the contaminated site.	18	The impacted soil , groundwater and LNAPL is located about 3.0 m below ground and there is no direct exposure pathway for ecological receptors with the exception of a small area of shallow impacted soil located near the fuel dispensing stand. The presence of LNAPL at the site automatically ranks the site as a Class 1, however, the scoring is completed on the basis of potential exposure in order to compare with other Class 1 sites.	Some low levels of impact to ecological receptors are considered acceptable, particularly on commercial and industrial land uses. However, if ecological effects are deemed to be severe, the site may be categorized as class one (i.e., a priority for remediation or risk management), regardless of the numerical total NCS score. For the purpose of application of the NCS, effects that would be considered severe include observed effects on survival, growth or reproduction which could threaten the viability of a population of ecological receptors at the site. Other evidence that qualifies as severe adverse effects may be determined based on professional judgement and in consultation with the relevant jurisdiction. If ecological effects are determined to be severe and an automatic Class 1 is assigned, there is no need to proceed through the NCS. However, a scoring guideline (18) is provided in case a numerical score for the site is still desired (e.g., for comparison with other Class 1 sites).	CCME, 1999: Canadian Water Quality Guidelines for the Protection of Aquatic Life www.ccme.ca CCME, 1999: Canadian Water Quality Guidelines for the Protection of Agricultural Water Uses www.ccme.ca Sensitive receptors- review: Canadian Council on Ecological Areas www.ccea.org. Ecological effects should be evaluated at a population or community level, as opposed to at the level of individuals. For example, population-level effects could include reduced reproduction, growth or survival in a species. Community-level effects could include reduced species diversity or relative abundances. Further discussion of ecological assessment endpoints is provided in *A Framework for Ecological Risk Assessment: General Guidance* (CCME 1996). Notes: Someone experienced must provide a thorough description of the sources researched to classify the environmental receptors in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps/reports and other resource such as internet links.
Same as above, but "Strongly Suspected" based on observations or indirect evidence.	12		This category can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients >1. Alternatively, known impacts can also be evaluated based on a weight of evidence assessment involving a combination of site observations, tissue testing, toxicity testing and quantitative community assessments. Scoring of adverse effects on individual rare or endangered species will be completed on a case-by-case basis with full scientific justification.	
No quantified or suspected exposures/impacts in terrestrial or aquatic organisms	0		This category can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients of less than 1 and no other observable or measurable sign of impacts. Alternatively, it can be based on a combination of other lines of evidence showing no adverse effects, such as site observations, tissue testing, toxicity testing and quantitative community assessments.	
	Go to Potential			
Score	---			

NOTE: If a score is assigned here for Known Exposure, then you can skip Part B (Potential for Ecological Exposure) and go to Section 4 (Ecological Exposure Modifying Factors)

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

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Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
B. Potential for ecological exposure (for the contaminated portion of the site)				
a) Terrestrial i) Land use Agricultural (or Wild lands) Residential/Parkland Commercial Industrial Do Not Know	Commercial	The property is considered commercial as the public has limited access to the site, but is not resident on the property.	Review zoning and land use maps. If the proposed future land use is more "sensitive" than the current land use, evaluate this factor assuming the proposed future use is in place (indicate in the worksheet that future land use is the consideration). Agricultural land use is defined as uses of land where the activities are related to the productive capability of the land or facility (e.g., greenhouse) and are agricultural in nature, or activities related to the feeding and housing of animals as livestock. Wild lands are grouped with agricultural land due to the similarities in receptors that would be expected to occur there (e.g., herbivorous mammals and birds) and the similar need for a high level of protection to ensure ecological functioning. Residential/Parkland land uses are defined as uses of land on which dwelling on a permanent, temporary, or seasonal basis is the activity (residential), as well as uses on which the activities are recreational in nature and require the natural or human designed capability of the land to sustain that activity (parkland). Commercial/Industrial land uses are defined as land on which the activities are related to the buying, selling, or trading of merchandise or services (commercial), as well as land uses which are related to the production, manufacture, or storage of materials (industrial).	
Score	1			
ii) Uptake potential Direct Contact - Are plants and/or soil invertebrates likely exposed t contaminated soils at the site? Yes No Do Not Know	Yes	The majority of contaminants are present below 3.0 and exposure to ecological receptors such as plants and soil invertebrates is considered very unlikely. However, a small area of impacted soil is present in the upper 1.5 m near the fuel dispensing stand.	If contaminated soils are located within the top 1.5 m, it is assumed that direct contact of soils with plants and soil invertebrates is an operable exposure pathway. Exposure to soils deeper than 1.5 m possible, but less likely.	
Score	1			
iii) Ingestion (i.e., wildlife or domestic animals ingesting contaminated food items, soils or water) Are terrestrial animals likely to be ingesting contaminated water at the site? Yes No Do Not Know	No	Terrestrial animals are not likely to ingest contaminated water at the site as there is no surface water present on-site.	Refer to an Ecological Risk Assessment for the site. If there is contaminated surface water at the site, assume that terrestrial organisms will ingest it.	
Score	0			
Are terrestrial animals likely to be ingesting contaminated soils at the site? Yes No Do Not Know	Yes	Terrestrial animals could ingest contaminated soil at the site as a small area shallow impacted soil is present near the fuel dispensing stand.	Refer to an Ecological Risk Assessment report. Most animals will co-ingest some soil while eating plant matter or soil invertebrates.	
Score	1			
Can the contamination identified bioaccumulate? Yes No Do Not Know	No	The log Kow is not greater than 4 for the BTEX and PHC Fractions present at the site, therefore, the contaminants are not considered to bioaccumulate.	Bioaccumulation of contaminants within food items is considered possible if: 1) The Log(Kow) of the contaminant is greater than 4 (as per the chemical characteristics work sheet) and concentrations in soils exceed the most conservative CCME soil quality guideline for the intended land use, or 2) The contaminant in collected tissue samples exceeds the Canadian Tissue Residue Guidelines.	
Score	0			
Distance to sensitive terrestrial ecological area 0 to 300 m 300 m to 1 km 1 to 5 km > 5 km Do Not Know	300 m to 1 km	The site is located 430 m from the North Saskatchewan River, which is considered as a sensitive ecological area.	It is considered that within 300 m of a site, there is a concern for contamination. Therefore an environmental receptor located within this area of the site will be subject to further evaluations. It is also considered that any environmental receptor located greater than 5 km will not be a concern for evaluation. Review Conservation Authority mapping and literature including Canadian Council on Ecological Areas link:www.ccea.org.	Environmental receptors include: local, regional or provincial species of interest or significance; arctic environments (on a site specific basis); nature preserves, habitats for species at risk, sensitive forests, natural parks or forests.
Score	2			
Raw Terrestrial Total Potential	5	Note if a "Known" Ecological Effects score is provided, the "Potential" score is disallowed.		
Allowed Terrestrial Total Potential	5			
B. Potential for ecological exposure (for the contaminated portion of the site)				
b) Aquatic i) Classification of aquatic environment Sensitive Typical Not Applicable (no aquatic environment present) Do Not Know	Typical	The North Saskatchewan River is considered a typical aquatic environment.	"Sensitive aquatic environments" include those in or adjacent to shellfish or fish harvesting areas, marine parks, ecological reserves and fish migration paths. Also includes those areas deemed to have ecological significance such as for fish food resources, spawning areas or having rare or endangered species. "Typical aquatic environments" include those in areas other than those listed above.	
Score	1			
ii) Uptake potential Does groundwater daylighting to an aquatic environment exceed th CCME water quality guidelines for the protection of aquatic life at th point of contact? Yes No (or Not Applicable) Do Not Know	No	There is no evidence that impacted groundwater is daylighting to an aquatic environment. Groundwater monitoring wells are located between the impacted area and the aquatic environment that do not show any evidence of impacts.	Groundwater concentrations of contaminants at the point of contact with an aquatic receiving environment can be estimated in three ways: 1) by comparing collected nearshore groundwater concentrations to the CCME water quality guidelines (this will be a conservative comparison, as contaminant concentrations in groundwater often decrease between nearshore wells and the point of discharge). 2) by conducting groundwater modeling to estimate the concentration of groundwater immediately before discharge. 3) by installing water samplers, "peepers", in the sediments in the area of daylighting groundwater.	
Score	0			
Distance from the contaminated site to an important surface water resource 0 to 300 m 300 m to 1 km 1 to 5 km > 5 km Do Not Know	300 m to 1 km	The North Saskatchewan River is 430 m from the impacted area.	It is considered that within 300 m of a site, there is a concern for contamination. Therefore an environmental receptor or important water resource located within this area of the site will be subject to further evaluation. It is also considered that any environmental receptor located greater than 5 km away will not be a concern for evaluation. Review Conservation Authority mapping and literature including Canadian Council on Ecological Areas linkwww.ccea.org.	Environmental receptors include: local, regional or provincial species of interest or significance, sensitive wetlands and fens and other aquatic environments
Score	2			
			Bioaccumulation of food items is possible if:	

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
Are aquatic species (i.e., forage fish, invertebrates or plants) that are consumed by predatory fish or wildlife consumers, such as mammals and birds, likely to accumulate contaminants in their tissues? Yes No Do Not Know	No	Given the absence of exposure pathways to the aquatic environment, it is not considered possible for wildlife to accumulate contaminants.	1) The Log(Kow) of the contaminant is greater than 4 (as per the chemical characteristics work sheet) and concentrations in sediments exceed the CCME ISQGs. 2) The contaminant in collected tissue samples exceeds the CCME tissue quality guidelines.	
Score	0			
Raw Aquatic Total Potential	3	Note if a "Known" Ecological Effects score is provided, the "Potential" score is disallowed.		
Allowed Aquatic Total Potential	3			
4. Ecological Exposure Modifying Factors				
a) Known occurrence of a species at risk. Is there a potential for a species at risk to be present at the site? Yes No Do Not Know	No	The project site is located adjacent to the City of Prince Albert Airport in a developed area. There is limited potential for wildlife or species at risk to be present on the site, and there are no exposure pathways between the contaminants and wildlife.	Consult any ecological risk assessment reports. If information is not present, utilize on-line databases such as Eco Explorer. Regional, Provincial (Environment Ministries), or Federal staff (Fisheries and Oceans or Environment Canada) should be able to provide some guidance.	Species at risk include those that are extirpated, endangered, threatened, or of special concern. For a list of species at risk, consult Schedule 1 of the federal Species at Risk Act (http://www.sararegistry.gc.ca/species/schedules_e.cfm?id=1). Many provincial governments may also provide regionally applicable lists of species at risk. For example, in British Columbia, consult: BCMWLAP. 2005. Endangered Species and Ecosystems in British Columbia. Provincial red and blue lists. Ministry of Sustainable Resource Management and Water, Land and Air Protection http://srmwww.gov.bc.ca/atrisk/red-blue.htm
	0			
Score	---			
b) Potential impact of aesthetics (e.g., enrichment of a lake or tainting of food flavor). Is there evidence of aesthetic impact to receiving water bodies?	No	There is no evidence that the impacts on the property have impacted the aesthetics of the river.	Documentation may consist of environmental investigation reports, press articles, petitions or other records.	This Item will require some level of documentation by user, including contact names, addresses, phone numbers, e-mail addresses. Evidence of changes must be documented, please attach copy of report containing relevant information.
Yes No Do Not Know	0 ---			
Is there evidence of olfactory impact (i.e., unpleasant smell)?	No	No olfactory impacts were detected during the Phase III ESA.	Examples of olfactory change can include the smell of a COPC or an increase in the rate of decay in an aquatic habitat.	
Yes No Do Not Know	0 ---			
Is there evidence of increase in plant growth in the lake or water body?	No	No abnormal plant growth was observed during the Phase III ESA.	A distinct increase of plant growth in an aquatic environment may suggest enrichment. Nutrients e.g. nitrogen or phosphorous releases to an aquatic body can act as a fertilizer.	
Yes No Do Not Know	0 ---			
Is there evidence that fish or meat taken from or adjacent to the site smells or tastes different?	No	There was no information found.	Some contaminants can result in a distinctive change in the way food gathered from the site tastes or smells.	
Yes No Do Not Know	0 ---			
Ecological Modifying Factors Total - Known	**0**			
Ecological Modifying Factors Total - Potential	**---**			
Raw Ecological Total - Known	0			
Raw Ecological Total - Potential	8			
Raw Ecological Total	8			
Ecological Total (Max 18)	**8.0**			
5. Other Potential Contaminant Receptors				
a) Exposure of permafrost (leading to erosion and structural concerns)		There is no permafrost at the property.		Plants and lichens provide a natural insulating layer which will help prevent thawing of the permafrost during the summer. Plants and lichens may also absorb less solar radiation. Solar radiation is turned into heat which can also cause underlying permafrost to melt.
Are there improvements (roads, buildings) at the site dependant upon the permafrost for structural integrity?	No		Consult engineering reports, site plans or air photos of the site. When permafrost melts, the stability of the soil decreases, leading to erosion. Human structures, such as roads and/or buildings are often dependent on the stability that the permafrost provides.	
Yes No Do Not Know	0 ---			
Is there a physical pathway which can transport soils released by damaged permafrost to a nearby aquatic environment?	No	There is no permafrost at the property.	Melting permafrost leads to a decreased stability of underlying soils. Wind or surface run-off erosion can carry soils into nearby aquatic habitats. The increased soil loadings into a river can cause an increase in total dissolved solids and a resulting decrease in aquatic habitat quality. In addition, the erosion can bring contaminants from soils to aquatic environments.	
Yes No Do Not Know	0 ---			
Other Potential Receptors Total - Known	**0**			
Other Potential Receptors Total - Potential	**0**			

Exposure Total		
Raw Human Health + Ecological Total - Known	0	
Raw Human Health + Ecological Total - Potential	23	Only includes "Allowed potential" - if a "Known" score was supplied under a given category then the "Potential" score was not included.
Raw Total	23	
Exposure Total (max 34)	**17.0**	

CCME National Classification System (2008, 2010 v 1.2)
Score Summary

Scores from individual worksheets are tallied in this worksheet.
Refer to this sheet after filling out the revised NCS completely.

I. Contaminant Characteristics

	Known	Potential
1. Residency Media	4	---
2. Chemical Hazard	8	---
3. Contaminant Exceedance Factor	8	---
4. Contaminant Quantity	6	---
5. Modifying Factors	4	---
Raw Total Score	30	0
Raw Total Score (Known + Potential)	30	
Adjusted Total Score (Raw Total / 40 *33)	**24.8**	(max 33)

II. Migration Potential

	Known	Potential
1. Groundwater Movement	12	---
2. Surface Water Movement	---	3.9
3. Soil	12	---
4. Vapour	12	---
5. Sediment Movement	0	---
6. Modifying Factors	4	0
Raw Total Score	40	3.9
Raw Total Score (Known + Potential)	43.9	
Adjusted Total Score (Raw Total / 64 * 33)	**22.6**	(max 33)

III. Exposure

	Known	Potential	
1. Human Receptors			
A. Known Impact	---		
B Potential			
a. Land Use		1	
b. Accessibility		0	
c. Exposure Route			
i. Direct Contact		3	
ii. Inhalation		6	
iii. Ingestion		5	
2. Human Receptors Modifying Factors	0	---	
Raw Total Human Score	0	15	
Raw Total Human Score (Known + Potential)	15		
Adjusted Total Human Score	15.0	(maximum 22)	
3. Ecological Receptors			
A. Known Impact	---		
B. Potential			
a. Terrestrial		5	
b. Aquatic		3	
4. Ecological Receptors Modifying Factors	0	---	
Raw Total Ecological Score	0	8	
Raw Total Ecological Score (Known + Potential)	8		
Adjusted Total Ecological Score	8.0	(maximum 18)	
5. Other Receptors	0	0	
Total Other Receptors Score (Known + Potential)	0		
Total Exposure Score (Human + Ecological + Other)	**23.0**		
Adjusted Total Exposure Score (Total Exposure / 46 * 34)	**17.0**	(max 34)	

Site Score

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Site Letter Grade	**C**
Certainty Percentage	**81%**
% Responses that are "Do Not Know"	**0%**
Total NCSCS Score for site	**64.4**
Site Classification Category	**2**

Site Classification Categories*:

Class 1 - High Priority for Action (Total NCS Score >70)
Class 2 - Medium Priority for Action (Total NCS Score 50 - 69.9)
Class 3 - Low Priority for Action (Total NCS Score 37 - 49.9)
Class N - Not a Priority for Action (Total NCS Score <37)
Class INS - Insufficient Information (>15% of responses are "Do Not Know")

* NOTE: The term "action" in the above categories does not necessarily refer to remediation, but could also include risk assessment, risk management or further site characterization and data collection.