PHASE III ENVIRONMENTAL SITE ASSESSMENT **BOSTON CAMP HOPE BAY PROJECT, NU**













REPORT

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EXECUTIVE SUMMARY

EBA Engineering Consultants Ltd. operating as EBA, A Tetra Tech Company (EBA), is pleased to provide this report to Newmont Affiliate Hope Bay Mining Ltd. (HBML) on the Phase III Environmental Site Assessment (ESA) conducted at the Boston Advanced Exploration Project (Boston Camp, hereafter referred to as the Site) located within the Hope Bay project area. The Site is approximately 65 km east of Umingmaktok and 170 km southwest of Cambridge Bay, Nunavut (Figure 1). The Phase III ESA report is a part of the submissions related to the Final Abandonment and Restoration Plan for the Site, as per Licence No. 2BB-BOS1217 Type "B" issued to HBML by the Nunavut Water Board.

The objectives of the Phase III ESA for the Site were to:

- Delineate the identified constituents of concern [petroleum hydrocarbons (PHCs)] in soil, sediment, and groundwater;
- Install and collect water samples from groundwater wells surrounding the Site for PHCs, dissolved CCME metals and routine water;
- Calculate the volume of hydrocarbon-impacted soil; and
- Determine pathways of movement or migration of contaminants through soil and groundwater to refine the site conceptual model as well as the fate and transport and risk assessment models.

Based on the known history of the Site, previous Site documents, and a walk-through of the Site upon arrival, the Site was divided into five areas of environmental concern (AEC) and two areas of potential environmental concern (APEC). The five AEC were:

- AEC 1 Generator Shed;
- AEC 2 Generator near the camp;
- AEC 3 Tank Farm Perimeter;
- AEC 6 Incinerator; and
- AEC 7 Water Pump Building.

The two APEC sites were:

- APEC 1 the Land Farm Perimeter; and
- APEC 5 the Retention Pond.

Prior to the Phase III ESA, HBML asked EBA to also collect samples from inside the landfarm. For simplicity, the area inside the landfarm is referred to in the Phase III ESA as part of APEC 1. Figure 4 shows the AECs and APECs that were sampled during the Phase III ESA.

Test pits were dug by either a power auger, hand auger or a combination of both, logged, and samples were bagged for field soil screening (hydrocarbon vapours) at approximate intervals of 25 cm. Shallow holes were dug with a hand auger near AEC 7, but no visible indications of PHC impacts were detected. No permafrost was encountered in the test pits, even though the deepest pit was 1.75 m. Soil sampling, groundwater and surface water sampling were completed on August 11 and 12, 2012.

A summary of the Phase III ESA results with areas and estimated in-situ volumes of soils having concentrations of PHC concentrations higher than the Nunavut/ Canadian Council of Ministers of the Environment (CCME) guidelines for industrial, coarse grained soils is provided below.

Site PHC Soils Exceeding Nunavut and CCME Industrial Soil Guidelines (coarse grained)

Area	Location	Parameter Guidelines Guidelines Concentration (mg/kg)		Maximum PHC Concentrations (mg/kg)	Area (m²)	Estimated Depth (m)	Estimated In-Situ Volume (m³)	
		Benzene	0.03	0.03	0.13			
		Tolunene	0.37	0.37	4.3			
AEC 2	Generator	Ethylbenzene	0.082	0.082	9.1	124	2	250
AEC 2	Generator	Xylene	11	11	100	124	2	230
		F1	320	240	5800			
		F2	260	260	11000			
		Benzene	0.03	0.03	0.33			
		Tolunene	0.37	0.37	25			
		Ethylbenzene	0.082	0.082	17			
APEC 1	Inside the Landfarm	Xylene	11	11	140	358	0.28	In-Situ Volume
'	Landiaiiii	F1	320	240	5300			
		F2	260	260	47000			
		F3	1700	1700	9600			

Most groundwater and surface water samples exceeded applicable guidelines for chloride, nitrate, nitrite and iron. The remaining groundwater and surface seep sample parameters were below guidelines or laboratory detection limits.

Approximately 348 m³ of soils impacted with benzene, ethylbenzene, toluene, and xylenes (BTEX), and hydrocarbon fraction F1 to F3 concentrations were identified. About 100 m³ of this impacted soil was already in a landfarm. The estimated volume of soils had greater concentrations of BTEX and fractions F1 to F3 than the Nunavut PHC guidelines for industrial land use.

Based on the evaluation of the impacted areas (AEC 2 and APEC 1), the remediation options provided, and the outcome of the soil analysis for PHC, the preferred remedial approach for the Site would be in-situ bioremediation. The SiREM study, conducted in 2011 on soil from the Windy and Patch Camps, suggests that the bioremediation of fraction F2 impacted soils by undisturbed, aerobic techniques would be effective. Landfarming of AEC 2 could cause additional issues, since the area would likely need to be excavated to at least 2 m below grade and would expose free water at 1 m. APEC 1 would be left in the landfarm, turned periodically and have the same fertilizer amendment as AEC 2.

The probable range of remedial cost for the in-situ bio remediation is estimated to range between \$170,000 and \$260,000, with a remedial timeframe of two to three treatment seasons. This estimate was based on the report written by EBA (2010), but it does not include permitting costs, engineering costs, and periodic engineering effort to monitor and sample the water and soils at the facility.

Based on the outcomes of this Phase III ESA, the following recommendations apply to the Site for closure:

- AEC 2 (248 m³ of impacted soil) should be remediated using land farming with fertilizers and tilling.
 The SiREM study suggests that the bioremediation of fraction F2 impacted soils by undisturbed, aerobic techniques would be effective.
- APEC 1 (100 m³ of impacted soil) can be remediated in-situ, as it is already in a land farm. This area should be turned periodically with a nutrient amendment to increase biodegradation of PHC.
- Further investigation underneath the pad at AEC 1, AEC 3 and APEC 5 are still required.
- Any fuel remaining in aboveground storage tanks on the Site should be collected and disposed of, in accordance with Nunavut regulations, in order to prevent any possible further hydrocarbon soil impacts.
- Further investigation into the high salinity values in the groundwater monitoring wells and surface water.
- Water quality in the groundwater monitoring wells should be continued to be monitored yearly.

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1.0 INTRODUCTION

I.I General

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1.2 Authorization

Ms. Angela Holzapfel, Environmental Compliance Manager at HBML authorized EBA to proceed with the work on March 31, 2012. The Professional Services Agreement number is PSA-HB-10-KE-001 and the Work Order Number is CR-0329-2.

1.3 Scope of Work

EBA developed the work plan based on previous reports related to historic spills at the Site facility and an evaluation of current and historic site operations. The scope of work for the Phase III ESA, as outlined in the proposal (EBA File: PY2210173, dated February 3, 2012) and adjusted during the work, was as follows:

- Prepared a health and safety plan for the field program using EBA's in house Safe Work Form (SWF). A
 safety meeting, including a field level risk assessment was conducted on-site prior to the start of the
 field program. All workers on-site agreed to the conditions of the SWF before work commenced. In
 addition, EBA staff completed HMBL's in-house site orientation and site-specific training.
- Conducted a Phase III ESA to delineate PHC and lead impacts only, with a sufficient data density to estimate weighted-average soil volume estimates for the PHC fractions F1 to F4 and to evaluate areas where the soils are affected by diesel, waste oil, other types of hydrocarbons, or combinations of spills.

- Assessed the following Areas of Environmental Concern (AECs) and Areas of Potential Environmental Concern (APECs) (Figure 4):
 - AEC 1 Generator Shed/ Maintenance Building;
 - AEC 2 Generator;
 - AEC 3 Tank Farm Perimeter;
 - AEC 6 Incinerator;
 - AEC 7 Water Pump Building;
 - APEC 1 Landfarm; and
 - APEC 5 Retention Pond Perimeter.
- Obtained soil samples at regular intervals from all boreholes. Examined soil samples for staining and obvious odour. Measured the photoionization potential on samples using a photoionization detector (PID). Site delineation was achieved using a combination of laboratory sampling, supplemented with the use of a PID. Boreholes were logged and sample locations were recorded by GPS measurement.
- Submitted 38 soil samples to Maxxam Analytics Inc. of Edmonton for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX), and PHC fractions F1 to F4. Submitted select samples for sieve analysis.
- Conducted groundwater monitoring of five wells at the Site, including purging the wells in accordance
 with EBA procedures and sampling for laboratory analysis of one or more routine water, dissolved
 regulated metals, BTEX, and PHC fractions F1 and F2. Submitted two surface water samples for
 analysis of routine water, dissolved regulated metals, BTEX, and PHC fractions F1 and F2 to assess the
 surface water condition at the Site.
- Prepared this Phase III ESA report discussing field observations and analytical results.

2.0 BACKGROUND INFORMATION

2.1 Location, Ownership and Current Land Use

The Hope Bay Project is on Inuit-owned land administered by the Kitikmeot Inuit Association (KIA), with minerals development authority vested within Nunavut Tunngavik Inc. (NTI). Depending on the location of land within the Hope Bay project area, three entities administer surface and subsurface mine leases on behalf of the Inuit; the KIA (surface rights), the NTI (subsurface rights), and Aboriginal Affairs and Northern Development Canada (both surface and subsurface rights).

HBML has secured access and mineral rights to the Hope Bay Project through land use and commercial land leases negotiated with these stakeholders.

The current land use is classified as Industrial, but the Site is currently under care and maintenance. There is no current or future anticipated groundwater use at the Site.

The Site is a mining exploration support facility operated by HBML. The Site is on leased Inuit-owned land within the West Kitikmeot region of Nunavut, located at approximately 67°39'N, 106°22'W. The Site is currently authorized under Nunavut Water Board Type B Water License 2BB-BOS1217.

2.2 Site History and General Description of Site

The Site was established in 1995, with the original Water Licence N7L2-1652 Type B issued to BHP Minerals Canada Ltd. by the Northwest Territories Water Board on August 1, 1995. Currently, the Site consists of two maintenance shops, generator sheds with generators, two helipads, laydown areas, an incinerator, six 80,000 L fuel storage tanks, two 50,000 L fuel storage tanks contained within an HDPE lined containment area, a fresh water pump house, aboveground grey water and potable pipelines, wastewater treatment plant, and tents and trailers for accommodations, offices and cooking (SRK 2012). All structures are constructed on a crushed rock pad that varies in size of material from coarse gravel to boulders, with a thickness from approximately 0.6 m to 3 m, and slopes north at about a 1% gradient (SRK 2009).

The Site has a short airstrip that was used to transport employees by smaller aircrafts such as a Twin Otter. There are no all-weather roads on-site for exploration; therefore exploration was conducted using tracked vehicles in the winter or helicopters in the summer (SRK 2012). The camp can house approximately 65 people.

Supplies are transported to Roberts Bay via barges in the summer before freeze up and stored at Roberts Bay, which is just north of Doris Camp (Figure 2). Once adequate snow and ice cover is available, a winter road is constructed from Roberts Bay to the Site to transport the supplies to the Site and backhaul wastes to Roberts Bay (SRK, 2012).

2.3 Site Details

In June 2012, the Site underwent modifications by installing a new wastewater treatment facility, rearranging tents and constructing a central corridor that lead to the main camp building. The Site is currently uninhabited and is under care and maintenance with regular inspections conducted by HBML Project personnel.

The primary contaminant of concern is PHC, which originated from historic spills and storage of fuel. Previous ESAs at the Site were conducted in 2003 (EBA 2004) and 2009 (WESA 2009). A Phase II ESA Report (WESA 2009) evaluated soils in the landfarm (Figure 3) and reported F2 and F3 hydrocarbon fractions higher than the generic Canadian Council of Ministers of the Environment (CCME) environmental guidelines.

The Hydrocarbon Spill Assessment and Remediation report (EBA, 2004) indicated that soil hydrocarbon impacts mainly resulted from three diesel spills in 2003. These spills occurred on the southwest corner of the maintenance shop, on the southwest corner of the generators and near the Site helipad. An estimated 4,000 litres of diesel fuel were spilled near the southwest corner of the maintenance shop (Spill Report # 03-452), 150 litres of diesel fuel near the southwest corner of the generators near the camp (Spill Report # 03-541) and an unknown amount of fuel near the Site helipad. There was also another spill near the maintenance shop of 2000 litres of diesel (Spill Report # 03-457).

A collection system for the treatment of hydrocarbon-impacted water was constructed southwest of the maintenance building and east of helipad (Figure 4). Approximately 350 litres of water were treated before being conveyed to a lined pond for later discharge to a location east of the pond. Another 82,000 L of hydrocarbon-impacted water was treated and discharged on the tundra east of the storage pond.

Twenty-seven test pits were dug on-site in August 2003 and 22 groundwater monitoring wells were installed. Eight of these wells contained free phase product. Two interception trenches with catch basins, liners and pumps were constructed: one by the Site helipad and one by the maintenance shop.

Most of the soil hydrocarbon impacts were located between the Site generators and the maintenance shop. The estimated hydrocarbon-impacted soil volume for this area was 8,000 cubic metres in 2003. About 30 cubic metres was excavated from an area near the generators and placed in the landfarm (referred to by WESA as the soil treatment facility) located southwest of the tank farm. According to the report, toluene, xylene, and fractions F2 and F3 hydrocarbon impacts remained on the west wall, north wall, and base of the excavated area.

Other potential historic fuel-impacted areas include the helipad closest to the maintenance shop. Suspected hydrocarbon impacts in this area were based on visual observations. Another area potentially impacted with fuel included an area between the shop and a location approximately 10 m southwest of the shop. These potential impacts were based on MultiRae multi-gas monitor readings of the soil in this location.

2.4 Climate

Based on meteorological data from weather stations at Cambridge Bay, approximately 170 km northeast of the Site and Contwoyto Lake, approximately 300 km southwest of the Site, the mean annual temperature is -15°C and -12°C, respectively. Based on 68 months of data at the Hope Bay project, the mean monthly air temperatures for Doris Station ranged from -33.2°C in February 2008 to 13.2°C in July 2007. The annual average temperatures for 2002 to 2009, using only complete years of available data, were -11.7°C and -11.1°C at Boston and Doris Stations, respectively (Rescan, 2009).

Total annual rainfall from 2002 to 2009 (based on available complete years) averaged 30 mm and 85 mm at Boston and Doris Stations, respectively (Rescan, 2009). The 1971 to 2000 climate normal annual precipitation at Cambridge Bay regional station is 139 mm, comprised of 70 mm of rainfall and 69 mm of snow water equivalent.

2.5 Site Topography and Vegetation

The Hope Bay Project generally has a low to moderate surface relief, and the Site has approximately 13 m of differential elevation between the low point (shore of Aimaokatalok Lake) and the high point (ridge by portal). The surficial deposits that overlie the bedrock consist of glacial till, glaciofluvial deposits, lacustrine deposits, and alluvial deposits.

The Site is situated on a ridge, which comprises a peninsula extending northwards into Aimaokatalok Lake. Aimaokatalok Lake is located approximately 100 m west and 185 m north and Stickleback Lake is about 115 m east of the Site. The Site is approximately 325 m long by 150 m wide, covering an area of about 48,750 m².

Areas of felsenmeer are common and swampy areas are also present. Tundra and moss cover the ground even at higher elevations. Vegetation consists primarily of lichen, moss, dwarf willows, and birches.

2.6 Regional Quaternary Geology

The region was subjected to multiple glaciations during the Quaternary period. During each glaciation, the area was overridden by the northwestern sector of the Laurentide Ice Sheet. Evidence of only the most recent (Late Wisconsin) glaciation is preserved in the present-day landscape. Striations, orientation of eskers, grooves, and drumlins indicate that the predominant glacial ice movement was north-northwest.

The project area became ice-free about 8,800 years ago, as the southwest to northeast trending ice sheet melted back toward the southeast (Dyke and Prest, 1986) leaving a blanket of basal till as the ice retreated. Immediately following deglaciations, the sea level was about 200 m higher than at present (Dyke and Dredge, 1989). The entire project area was submerged and the edge of the ice sheet abutted the open sea. Meltwater streams from the ice carried fine grained sediments toward the sea, resulting in the accumulation of marine sediments on top of the till with the greatest accumulated thickness in the deeper water zones, which now form the valley bottoms.

Following glaciation, isostatic rebound caused a relative decline in sea level. During emergence, the land surface was washed by waves. Easily erodible surfaces such as marine sediments, till, and glaciofluvial sands and gravels were reworked and redistributed by waves, currents, and sea ice. Some present-day rock outcrops were exposed as the thin soil washed off the uplands and accumulated in the valley bottoms. Current outcrop cover varies from 35% to 80% in the region. Outcrops tend to form relatively continuous, north-northwest trending ridges throughout the area with broad tundra-covered flat valleys. Lakes are also elongated in a north-northwest direction. Since emergence, natural slope processes, frost action, and permafrost have contributed to the present day landscape.

2.7 Regional Bedrock Geology

Regional bedrock geology consists of sedimentary and volcanic rocks of the Arctic Platform (NRCAN, 1957). The Hope Bay project region is underlain by the late Archean Hope Bay Greenstone Belt, which is approximately 42 km and consists of mostly mafic volcanic rocks.

2.7.1 Regional and Local Surficial Soils

The Geological Survey of Canada indicates that glacial till deposits are predominant regionally. Pleistocene deposits are buried beneath marine sediments consisting of clay, silt, and sand. Marine sediments represent the dominant surficial material and the material may be saline. The overburden soil pore water can also have high salinity concentrations, often exceeding that of seawater (HBML, 2011). Soils developed on marine sediments are generally fine textured with textures ranging from clay to silty clay with traces of sand (EBA 1996). The overburden soils are normally consolidated, typically have low structural integrity, and are subject to compaction when wet.

According to HBML Phase III Project Proposal (HBML, 2011), marine silts and clays in the local area can contain significant (up to 50% by volume) ground ice, while the till contains low to moderate ice contents (5 to 25%). Solifluction and other slope movement features related to the thawing of poorly-drained and weak saturated soils on slopes can result in thaw flow slides known as earthflows and mudflows.

The bedrock contact zone generally consists of a small rubble zone ranging from a few centimeters to up to 2 m in thickness.

The majority of the soils encountered at the Site were fine to coarse grained sands with silt and a trace of clay. Where vegetation was present in undisturbed areas, the organic horizon ranged from 3 to 45 cm, with an average of about 9 cm.

2.7.2 Hydrogeology

The project area is coastal lowland with numerous lakes and ponds, separated by glacial landforms and parallel geological intrusions, including diabase dykes and sills. The drainage basins are generally long and narrow and predominantly oriented along the north-south axis. The predominant drainage in the area is north into Hope Bay.

Permafrost generally extends to -560 m (Heginbottom et. al., 1995). Ground temperature measurements in the project area indicate an active zone thickness ranging between 1.5 to 2.6 m (WESA 2009) and the depth of zero annual amplitude varying between 11 and 17 m (EBA 1996).

Groundwater in the continuous permafrost zone is confined to this shallow active layer. Based on the regional geology and the presence of permafrost, the groundwater flow is likely complex and controlled by topography, surface waterbodies, and bedrock structure. Vertical groundwater flow is limited by the shallow permafrost. The period of groundwater flow is highly influenced by climatic conditions and flow is also likely limited to the short summer season when the active layer thaws, thus allowing water to flow in this horizon. It is expected that the surface water bodies are expressions of the water table.

Water flow in the active layer is expected to follow surface topography, which appears to be from the high bedrock ridge to the west, into Aimaokatalok Lake.

3.0 ENVIRONMENTAL CRITERIA

The following subsections outline the rationale for the selection of applicable generic risk management guidelines for soil and surface water.

3.1 Land Use Assessment

CCME land use guidelines and Government of Nunavut land use guidelines currently recognize four different types of land use:

- Agricultural land use: lands used for growing crops or producing livestock, and that are agricultural in nature. These also include lands that provide habitat for resident and transitory wildlife and native flora.
- Residential/Parkland land use: lands where the primary activity is occupation for residency and recreational purposes. These include lands used as buffer zones between areas of residence, but do not include wild lands, such as national and provincial parks, other than campground areas.

- Commercial land use: lands where the primary activity is related to commercial operations, such as the
 provision of goods and services (e.g., shopping mall) and occupancy is not for residential or
 manufacturing purposes. These do not include operations where the growing of food is the primary
 activity (i.e., agricultural).
- Industrial land use: lands where the primary activity involved the production, manufacture, construction, and/or assembly of goods.

Canadian soil quality guidelines are derived for the protection of receptors under these four different land uses. The site use is currently classified as industrial. The industrial land use will be applicable during exploration phases and through the life of the mine until closure. On industrial lands, the primary land use activities are not directly dependent on the need to sustain a high level of ecological processes.

3.2 Particle Size Designation

A coarse-grained soil is defined as having a median grain size (D_{50}) of 75 μ m or greater, whereas a fine-grained soil has a D_{50} of less than 75 μ m. A review of the particle size analyses results for this Phase III ESA and the previous Phase II ESA study indicates that the soils are predominantly coarse-grained. These results corroborate soil textural observations in the field and additional particle size analyses conducted for this study. There was one area (APEC 5) where fine textured soils were observed and verified through laboratory analysis.

3.3 Applicable Exposure Pathways

3.3.1 Human Pathways

The Site is covered with sand, gravel, boulders, grassy areas, and sub-arctic tundra vegetation. The majority of the Site consists of short grass with sparse vegetation. Soil and water direct contact (dermal contact and ingestion) pathways are considered applicable at the Site during remedial activities.

Soil and water direct contact (dermal contact and ingestion) pathways are considered applicable pathways. There are no buildings in use, and given the future anticipated use of the Site, the vapour inhalation pathway can be excluded.

The drinking water pathway will be applicable if the Site opens again, since drinking water will come from Aimaokatalok Lake.

3.3.2 Ecological Pathways

Under this current land use, the eco-soil contact pathway is applicable. Given the proximity of Aimaokatalok Lake, the protection of groundwater for aquatic life (freshwater) is applicable.

3.4 Applicable Guidelines

Various regulatory guideline documents were consulted and are summarized in the sections below.

Canadian Soil Quality Guidelines consider both human health and ecological receptors, and are intended as general guidance for the protection, maintenance, and improvement of specific uses of land and water. Based on the existing site usage, the Nunavut/CCME industrial guidelines for soil are applicable.

SOIL CRITERIA

General Soil Criteria and PHCs

- CCME Soil Quality Guideline for the Protection of Environmental and Human Health Industrial Land Use (coarse-grained soils);
- CCME Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil; and
- Environmental Protection Division, Department of Environment, Government of Nunavut, Environmental Guideline for Contaminated Site Remediation (March 2009 Revised) – Industrial Land Use (coarse-grained soils).

The Canada-Wide Standard (CWS) for PHCs in Soil is a specialized case of CCME Soil Quality Guidelines (CCME, 2008). Hydrocarbons are subdivided into four broad physicochemical fractions as defined by the US Total Petroleum Hydrocarbons Criteria Working Group. The fractions are defined in equivalent carbon numbers as follows:

- F1: C6 to C10
- F2: >C10 to C16
- F3: >C16 to C34
- F4: C34+

The primary focus in PHC CWS standard development is prevention of toxic effects from F1 to F4 on the receptors, in certain situations these pathways may be of little immediate concern and PHC management is governed by other factors including:

- Ignition hazard
- Odour and appearance
- Effects on buried infrastructure
- Formation of non-aqueous phase liquids (NAPLs)
- Socio-economics and technological capabilities

Soil Quality Guidelines can be used as benchmarks to evaluate the need for further investigation or remediation with respect to a specified land use. Guidelines are applied to identify and classify sites, to assess the general degree of contamination at a site and to determine the need for further action, and as a basis for remediation objectives.

In the present study, soil PHC analyses were compared to the Government of Nunavut Tier 1 Environmental Guideline for Contaminated Site Remediation for Nunavut (industrial land use and coarse-grained soils). These criteria are similar to the Tier 1 CCME Canada-Wide Standards (CWS) for PHCs in soil. These criteria are:

Tier 1 Environmental Guidelines for Contaminated Site Remediation of Surface Soils - Coarse-Grained

Parameter	Environmental Guideline for Contaminated Site Remediation – Nunavut- Industrial (mg/kg)	CCME Soil Quality Guideline for the Protection of Environmental and Human Health- Industrial (mg/kg)
F1	240*	320
F2	260	260
F3	1,700	1,700
F4	3,300	3,300

^{*} For protection against contaminated groundwater discharge to an adjacent surface waterbody or for potable water

WATER CRITERIA

General Criteria

For the purpose of this assessment, water quality parameters were compared to:

CCME Canadian Water Quality Guidelines for Protection of Fresh/ Marine Water Aquatic Life.

As in the case of soils, the geochemical cycling of CCME regulated metals naturally present in the environment, especially in mining areas enriched in metals, may cause ambient water quality parameters to exceed the Tier 1 environmental guidelines. Mining activities that cause site disturbance and changes in pH and soil salinity are factors that may result in above-background metals concentrations in water.

The CCME does not have established water quality guidelines for the protection of aquatic life for total dissolved solids (TDS) or calcium (CCME, 2007).

Chlorides

In 2011, the CCME released a water guideline for chloride for the protection of aquatic life, including a long-term exposure guideline of 120 mg/L chloride and a short-term benchmark concentration of 640 mg/L chloride. The long-term exposure guideline is intended to protect all forms of aquatic life for an indefinite exposure period, whereas the short-term benchmark concentration is a concentration at which severe effects are likely to be observed over the longer-term, but which is deemed protective under short exposure terms (CCME, 2011).

Water Licence

As per Water Licence No. 2BB-BOS1217, the following water criteria apply to the still-active water monitoring program stations.

Water Licence Water Discharge Requirements for Station BOS-5 (Bulk Fuel Storage Facility) and BOS-6 (Landfarm)

Parameter	Maximum Average Concentration (mg/L)
Oil and Grease	15
Benzene	0.370
Toluene	0.002
Ethylbenzene	0.090
Lead	0.001

4.0 PHASE III SITE WORK AND RESULTS

4.1 Site Safety

In accordance with HBML's policies, EBA staff including Mr. Tyrel Hemsley and Mr. Michel Hebert, participated in a one-day site orientation and safety training, in addition to a bear awareness course, a hands-on training for the use of bear deterrents, and a briefing on both types of helicopters available on-site for proper loading and unloading of equipment. EBA completed its in-house Safe Work Form, which was updated and signed daily. Pre-job hazard assessments were completed prior to going in the field, and were updated with a field-level assessment once on-site. EBA participated in the staff safety meetings each morning, and prepared a trip planner each field day prior to going to the Site.

4.2 Soil Sampling Methods

Based on the known history of the Site, and previous Site documents, the Site was originally divided into seven areas of environmental concern (AECs) and ten areas of potential environmental concern (APECs). However, after a walk-through of the Site upon arrival, assessment of the pad thickness and length of time to dig through the pad, only five AECs and two APECs were investigated in this assessment. A summary key of the areas is provided on Figure 4, and detailed features of the areas are provided on Figures 4Ai to 4G. The areas are as follows:

Areas of Environmental Concern (AEC) at Boston Camp

150.4			Concern	
AEC 1	Generator Shed/Maintenance Building	6,000 L total Spill #: 2003452 and 2003457	Diesel	21
AEC 2	Generator near the Camp	150 L Spill #: 2003541	Diesel	8
AEC 3	Tank Farm (perimeter)	250 L Spill #: 2000147 and 2001143	Drilling oil and diesel	5
AEC 6	Incinerator (near the portal)	4x4 m area Spill #: 2000118	Diesel	4
AEC 7	Water Pump Building	1 L	Diesel	3

Areas of Potential Environmental Concern (APEC) at Boston Camp

Area	Area Location Description		Number of Test Pits				
APEC 1	Landfarm Area	PHC	15				
APEC 5	Retention Pond (perimeter)	PHC	3				
Note: These are only the APEC areas assessed in this assessment.							

Test pits were dug by either a power auger or hand auger. Soils were visually logged and bagged for field soils screening (hydrocarbon vapours) at approximate intervals of 25 cm (Appendix B). Soil sampling was completed on August 11, 2012.

A total of 47 logged test pits (Appendix A) were dug, of which 21 were completed with the power auger or combination, while the remainder of the 26 test pits were dug with a hand auger. Shallow holes were dug with a hand auger near AEC 7, but no visible indications of PHC impacts were detected. Test pit depths were to the free water surface or to auger refusal. The maximum test pit depth was 1.75 m below surface (including the pad), which was in the AEC2 area. No permafrost was encountered in the test pits.

The organic layer in the vegetated areas ranged from 3 to 45 cm, with an average of 9 cm. Soils in nearly all locations consisted of yellowish brown to brown sand or silty sand to about 0.5 m below grade. Sand ranged in size from fine to coarse, depending on the test pit. Fine to coarse gravel was encountered, along with a few boulders and fine to coarse cobbles in test pits. Soil moisture ranged from moist to wet, with some saturated soils encountered at APEC5.

Soils underlying the Site pad were difficult to assess, due to pad thickness. The Site pad consists of crushed rock that varies in size of material from coarse gravel to boulders with a thickness ranging from 0.6 m to 3 m. Some areas were unable to be examined, due to the difficulty of digging through the rock pad.

Soil samples were field screened using the ambient temperature headspace method. Soil samples were placed in plastic bags and allowed to adjust to outdoor air temperature, before the airspace within the bag was analyzed for combustible gases using a PID Drager Multi-PID 2+ instrument. PID screening results and depths of screened samples are shown next to the sample location on the boring logs in Appendix A.

Based on the PID screening and field observations, soil samples were selected for laboratory analysis. Soil samples were collected directly from the select test pits and packed with zero headspace in laboratory supplied jars, and stored in an insulated cooler with ice for transport to Maxxam Analytics International Corporation in Edmonton, Alberta. Field protocols and QA/QC procedures during sampling were in accordance with standard industry protocols. Holding times for all soil samples were within acceptable limits. All coolers still had ice present upon receipt at the laboratory, and the temperature was 5°C within the various coolers. No samples were broken or lost during transport.

A total of 38 samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), PHC fractions F1 to F4; and 5 samples were analyzed for particle size analysis (PSA).

4.3 Ground Water Sampling Methods

There were five shallow groundwater wells installed around the Site on August 10, 2012. Two were installed on the east side of the Site near AEC 7 and three were installed on the west side of the pad, all in undisturbed areas. Each well was purged dry before sampling. Field screening of the water samples was not completed, due to the limited availability of water in the wells. Ground water samples were collected in designated laboratory provided bottles and preserved as required for routine water, dissolved regulated metals, BTEX, and PHC fractions F1 to F2. There were some wells that had very limited amounts of water available, so only BTEX, and PHC fractions F1 to F2 were analysed (Table 8). Field protocols and QA/QC procedures during sampling were in accordance with standard industry protocols. Holding times for all water samples were within acceptable limits, except for dissolved nitrite (N) and nitrate (N). All coolers still had ice present upon receipt at the laboratory, and the temperature was 5°C within the various coolers. No samples were broken or lost during transport.

Ground water sample locations are shown on Figure 5, along with analytical results.

4.4 Surface Water Sampling Methods

Two surface water samples were collected for this Phase III ESA:

- The ponded water 5 m North of GW-3, and
- The ponded water 2 m East of GW-4,

Surface water samples were collected in designated laboratory provided bottles and preserved as required for routine water, dissolved regulated metals, BTEX, and PHC fractions F1 to F2. Field protocols and QA/QC procedures during sampling were in accordance with standard industry protocols. Holding times for all water samples were within acceptable limits, except dissolved nitrite (N) and nitrate (N). All coolers still had ice present upon receipt at the laboratory, and the temperature was 5°C within the various coolers. No samples were broken or lost during transport.

Surface water sample locations are shown on Figure 5, along with analytical results.

4.5 Soils Sampling Results

PHC sample analytical results for soils are shown on Figures 4Ai to 4G and on Tables 1 through 7 in the Tables section of the report, and complete laboratory reports are provided in Appendix B. A summary of the Phase III ESA results with areas and estimated in-situ volumes of soils having concentrations of PHC concentrations higher than the Nunavut/CCME guidelines for industrial, coarse grained soils is provided below, followed by a summary of observations for each of the seven (7) areas.

Site PHC Soils Exceeding Nunavut and CCME Industrial Soil Guidelines (Coarse Grained)

Area	Location	Parameter CCME Guidelines Nunavut Guidelines Maximum PHC Concentrations (mg/kg)		Area (m²)	Estimated Depth (m)	Estimated In-Situ Volume (m³)		
		Benzene	0.03	0.03	0.13			
		Tolunene	0.37	0.37	4.3			
۸۵۵۵	0	Ethylbenzene	0.082	0.082	9.1	404	0	250
AEC 2	Generator	Xylene	11	11	100	124	2	250
		F1	320	240	5800			
		F2	260	260	11000			
		Benzene	0.03	0.03	0.33			
		Tolunene	0.37	0.37	25			
		Ethylbenzene	0.082	0.082	17			
APEC 1	Inside the Landfarm	Xylene	11	11	140	358	0.28	100
	Landianii	F1	320	240	5300			
		F2	260	260	47000			
		F3	1700	1700	9600			

AEC I - Generator Shed/Maintenance Building

In 2003, there were approximately 6,000 litres of diesel fuel spilled near the southwest corner of the maintenance shop. The pad ranged in depth from 0.6 m to 2 m and was constructed with medium to coarse gravel, with cobbles and an occasional boulder. During the Phase III ESA, EBA was unable to drill through the thicker portions of the pad (>0.6 m) with the power auger, therefore test pits were dug around the edge of the pad and near the two interception trenches (Figure 4Ai and 4Aii).

Test pits located near the north interceptor trench (Figure 4Aii) had a diesel odour. In addition, two of the test pits had a sheen on the water (AEC1-16 and AEC1-17), but soil sample analysis from these pits were below the applicable guidelines for hydrocarbons. All other test pit samples were likewise below the applicable guidelines for hydrocarbons. Further investigation under the pad is required to identify potentially impacted soils where drilling did not occur, to confirm potentially impacted soils.

Soil analytical results are provided on Figure 4Ai and 4Aii, and in Table 1.

AEC 2 - Generator Spill

In 2003, approximately 150 litres of diesel fuel spill occurred in the area of the generator near the camp. This area is covered with a dense medium to coarse gravel fill, approximately 0.6 m deep, with cobbles and an occasional boulder. Analytical results (Figure 4B) and PID screening samples (Appendix B) from the Phase III ESA identified an area around the generator from the diesel spill in 2003 expanding northwards from the generator. The highest concentration of BTEX and hydrocarbon fractions F1 to F4 were at AEC 2-1 at 0.75 to 1.00 m depth, which were above applicable guidelines for hydrocarbons. Vertical delineation was not achieved at this location, although it is anticipated that the total depth of impacted soils is 2 m below grade.

Areas under the generator shack and the camp buildings were not assessed because the buildings are still present. It is likely that hydrocarbons may be present below these areas. As confirmed by analytical testing in conjunction with PID readings, hydrocarbon impacts exceeding regulatory guidelines were confined to an area of approximately 124 m² with a volume of 248 m³. It is important to note that at AEC 2-1, free water was found in the borehole at a depth of 1 m.

Soil analytical results are provided on Figure 4B and in Table 2.

AEC 3 - Tank Farm Perimeter

This area had two spills occur, one in 2000 (Spill report # 00-147) and another in 2001 (Spill report # 01-143) for a total of 230 litres of diesel fuel. During the Phase III ESA, EBA personnel were only able to assess the east side of the tank perimeter off the pad, due to the thickness of the pad (up to 3 m thick). Further investigation around the tank farm on the pad is required to confirm potentially impacted soils. All soil samples submitted to the laboratory were below the applicable guidelines for hydrocarbons.

Soil analytical results are provided on Figure 4C and in Table 3.

AEC 6 – Incinerator

In 2000, a 4 m x 4 m area was impacted by diesel fuel near the incinerator. During the Phase III ESA, a total of 4 test pits were dug surrounding the incinerator, with a maximum depth of 1.2 m. Analytical testing in conjunction with PID readings confirmed that soils were below applicable guidelines for hydrocarbons.

Soil analytical results are provided on Figure 4D and in Table 4.

AEC 7 – Water Pump Building

A one litre diesel spill occurred around the water pump house, but no previous soil assessment was completed, due to high water levels from Aimaokatalok Lake submerging the pump house. During the Phase III ESA, soil samples were collected using a hand auger and visually inspected, but no signs of impacted soils were observed. Therefore, no soil samples were collected around this area.

APEC I - Landfarm

The landfarm was constructed in 2003 by EBA (EBA, 2004), to store approximately 50 barrels of impacted soils from two hydrocarbon spills in 2003. During this Phase III ESA, an assessment was conducted around the landfarm on undisturbed soils and within the landfarm. Investigation of the landfarm was not part of EBA's original scope of work, but was requested by HBML. Soils were not investigated on the north and east side of the landfarm, due to the pad, but the west and south end of the pad were investigated using a hand auger (Figure 4E). Analytical testing in conjunction with PID readings confirmed that soils were below applicable guidelines for hydrocarbons.

In the landfarm (Figure 4F), soils varied in depths to the liner ranging from 7 cm to 56 cm, with an average of 28 cm. The highest concentration of BTEX and hydrocarbons F1 to F4 were at AEPC 2-1 at 0.3 to 0.5 m depth, which were all above applicable guidelines for hydrocarbons. The landfarm is 358 m² with a volume of approximately 100 m³ (0.28 m thickness was used for the volume calculation) of impacted soil.

Soil analytical results are provided on Figures 4E and 4F and in Table 5 and 6.

APEC 5 – Settling Pond

The settling pond was partially filled with water during the time of the investigation. Soil samples on the pad were not collected, as the pad was too thick for the power auger. However; samples adjacent to the settling pond on undisturbed soils were collected (Figure 4G). Soils in this area were classified as fine textured. Analytical testing in conjunction with PID readings confirmed that soils were below applicable guidelines for hydrocarbons.

Soil analytical results are provided on Figure 4G in Table 7.

Laboratory analytical results generally correlated with PID field screening and field observations.

4.6 Groundwater and Surface Water Sampling Results

Three of the five groundwater wells installed in 2012 (Wells GW-1, GW-3 and GW-5) had enough water to collect samples for the analysis of BTEX, PHC F1 and F2, routine water and dissolved CCME regulated metals:

- Well GW-1 (south of the Water Pump) had a total length of 2.06 m with 1.16 m below grade. Water level was 0.38 m below grade at this location.
- Well GW-3 (east of Settling Pond) had a total length of 1.72 m with 0.83 m below grade. Water level was 0.14 m below grade at this location.
- Well GW-5 (east of GW-3) had a total length of 1.69 m with 1.00 m below grade. Water level was 0.19 m below grade at this location.

Two groundwater wells installed in 2012 (wells GW-2 and GW-4) only had enough water to collect samples for the analysis of routine water and dissolved CCME regulated metals:

• Well GW-2 (north of the Water Pump) had a total length of 1.83 m, of which 0.93 m was below grade. The water level was 0.68 m below grade.

• Well GW-4 (east of Tank Farm) had a total length of 1.67 m, of which 0.80 m was below grade. The water level was 0.07 m below grade.

All wells had caps installed, and were purged dry. Each of the five wells contained brown turbid water. Field screening of water samples was not completed on samples before sending to the laboratory, as there was not enough water.

Two surface water samples were collected on the east side of the tank farm/settling pond area. One sample was 5 m north of GW-3 and the other 2 m east of GW-4. All samples were submitted for the analysis of BTEX, PHC fractions F1 and F2, routine water and dissolved CCME regulated metals.

Water analytical results and well locations are provided on Figure 5. Water analytical results are also provided in Table 9, and complete laboratory reports are provided in Appendix B.

A summary of the number of groundwater sample parameters that exceed guidelines is provided below:

Groundwater and Surface Water Exceedance Summary Table

Parameter	CCME Guideline for the protection of Freshwater Aquatic Life (mg/L) ¹	Number Samples Analyzed	Number of Exceedances	Range of Exceedances (mg/L)
Nitrate (NO ₃)	13	5	2	83-160
Nitrite (NO ₂)	0.06	5	2	0.099-0.18
Chloride	120	5	5	560 - 3600
Iron	0.3	5	3	0.45-0.71

Specific exceedances are described as follows and are presented in Figure 5 and Table 9.

- Monitoring well GW-1 exceeded the applicable guidelines for chloride (1100 mg/L);
- Monitoring well GW-3 exceeded the applicable guidelines for nitrate (83 mg/L), nitrite (0.18 mg/L), chloride (1,200 mg/L), and iron (0.53 mg/L);
- Monitoring well GW-5 exceeded the applicable guidelines for nitrite (0.099 mg/L), chloride (3,600 mg/L), and iron (0.71 mg/L);
- Surface seep sample 1 exceeded the applicable guidelines for nitrate (160 mg/L), and chloride (560 mg/L)and;
- Surface seep sample 2 exceeded the applicable guidelines for chloride (580 mg/L), and iron (0.45 mg/L);

¹ CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life

The remaining groundwater and surface seep sample parameters were below guidelines or laboratory detection limits.

Water quality values in the Water and Ore/Waste Rock Management Plan (SRK 2009) report that background runoff concentrations from undisturbed catchments do not exceed CCME guidelines for the protection of freshwater and aquatic life for the following parameters: chloride, nitrate, and nitrite. This may suggest that the chloride, nitrite and nitrate values observed in this study are above background values. Background runoff concentrations for iron observed in the Ore/Waste Rock Management Plan report were at 0.36 mg/L which is above CCME guidelines for the protection of freshwater and aquatic life. The values in this study ranged from 0.45 to 0.71, which may suggest that these values are natural observed in this area.

5.0 REMEDIAL OPTIONS

In 2010, EBA prepared a cold climate bioremediation literature review and ranked potential remediation options for Windy Lake Camp and Patch Lake Facility (EBA, 2010). A summary of remediation options with Arctic/Antarctic case studies was provided along with a listing of the advantages and disadvantages of each. Proposed remedial options for the Site were ranked using an approach based on the life cycle framework assessment for remediation options developed by Diamond et al. (1999).

Established soil treatment options that were evaluated for this report, from most rapid to the most protracted, included physical treatments, such as excavation and landfilling (encapsulation), incineration, thermal desorption, landfarming, or biopile remediation, surfactant addition, soil washing, and monitored natural attenuation.

Information to support bioremediation of soils via soil microorganisms in this region was obtained from a study conducted in 2011, by SiREM laboratories in Guelph Ontario for EBA and HBML. In this study, SiREM utilized five different treatments from soils collected from Windy Camp and Patch Lake Facility. Each microcosm was incubated at 50% water holding capacity at 10°C for 147 days. Below is a summary table of the results from this study:

Summary of Percent Removal of PHCs in Microcosm Study from SiREM

	F2	2 (C10-C16)	!	F3 (C16-C	34)	F	4 (C34-C50)
Treatment	% Removal	Initial [] (ug/g)	Final [] (ug/g)	% Removal	Initial [] (ug/g)	Final [] (ug/g)	% Removal	Initial [] (ug/g)	Final [] (ug/g)
Aerobic Active Control- Patch	65	4400	1550	-	3450	4600	-	570	645
Aerobic Treatment									
EHC-O (oxygen releasing compound) Amended-Patch	59	4400	1800	-	3450	4250	8	655	605
Aerobic Nutrient Amended-Patch	90	4400	455	29	3450	2450	33	680	455
Aerobic Nutrient and EHC-O Amended-Patch	80	4400	875	17	3450	2850	24	680	515
Aerobic Active Control- Windy	30	2800	1950	-	410	450	92	25	2
Aerobic Treatment EHC-O Amended- Windy	75	2800	700	-	410	495	13	24	21
Anaerobic Nitrate Amended-Windy	-	2800	2950	-	410	510	65	23	8
Anaerobic Sulfate and EHC-O Amended- Windy	-	2800	2800	-	410	510	-	14	23

A summary of the remedial alternatives for the PHC impacted areas is provided below:

Summary of Remediation Options for Boston Camp Soils

Areas	Predominant Hydrocarbon Fraction Requiring Treatment	Remedial Alternative
AEC 2 -	PHC: F1 to F3	Excavation and Off-Site Disposal
Generators	fraction	Advantages:
APEC 1 -	Source: historic	Quick remedial timeframe.
Inside Landfarm	diesel fuel spills	Disadvantages:
Landiaiiii	Concentrations: up to 47,000 mg/kg	Requires importation of clean backfill, which could be obtained on or near the Site.
	to 47,000 mg/kg	 Backfilling should be done as soon as possible after excavation in order to mitigate possible permafrost damage.
		Generally most expensive option.
		Landfarming: Hydrocarbon affected soils are spread out in a layer about 0.3 m to 0.5 m thick, nutrients are added, and periodically the soils are mixed (i.e., by tilling). Soil moisture may also be adjusted. Other amendments including proprietary oxygen releasing compounds may be added.
		Advantages:
		Proven technology in the arctic. Cost official acceptance region decide requiring tractment for discal fuel contemporation.
		 Cost effective for coarse-grained soils requiring treatment for diesel fuel contamination (F2, F3)
		Treated soils can be used as backfill where appropriate.
		Disadvantages:
		Treatment season in the arctic is short (generally three months).
		 Excavations in arctic generally require rapid importation of clean backfill in order to prevent permafrost damage.
		Requires monitoring and periodic tilling effort.
		 Requires the addition of amendments (nitrogen and phosphorous sources).
		Facility requires permitting and periodic inspections.
		 May be difficult to achieve most stringent remedial guidelines (Tier 1 remedial objectives for wildland land use).
		Facility collects precipitation and snowmelt that may require treatment prior to disposal.
		Biopiles: A bioremediation technique whereby the soil is piled over an air distribution system and aerated. The air distribution system can also be used to provide heat to the soil. Advantages:
		For a given volume of soils requiring treatment, biopiles require less area than a landfarm.
		 Stockpiling soil reduces the rate of heat loss by increasing the volume/surface ratio, effectively extending the length of the treatment season.
		Disadvantages:
		 Require significant engineering and entail higher construction/operation costs than a landfarm.

Summary of Remediation Options for Boston Camp Soils

Areas	Predominant Hydrocarbon Fraction Requiring Treatment	Remedial Alternative
		 Excavations generally require importation of clean backfill in order to prevent permafrost damage.
		 Forced air generally reduces remedial timeframes but there is a requirement for a power supply. Wind-powered systems may not be effective to achieve remedial goals. Construction materials (i.e., PVC pipe) must be disposed of at the end of remediation.
		Enhanced Anaerobic Biodegradation: Solutions of electron acceptors (nitrates and or
		sulphates) are applied to soils in-situ to enhance natural anaerobic biodegradation processes.
		Advantages:
		 Less site disturbance and damage to permafrost compared to excavating soils. Disadvantages:
		 Anaerobic degradation of hydrocarbons by microbes in polar climates is not well understood and there is little published research to establish this as a viable remedial alternative in the arctic.
		 Requires chemical inputs that must be controlled to avoid adverse effects on nearby water bodies (introduction of nitrates and sulphates into the environment).
		• The five month bench-scale study concluded that this option would not be successful for the Old Windy Camp soils, which has a location and soils similar to the Site.
		Aerobic In-situ Biodegradation : Solutions of nitrogen (20:20:20 fertilizer) are applied to soils in-situ to enhance natural aerobic biodegradation processes.
		Advantages:
		Less site disturbance and damage to permafrost compared to excavating soils.
		 The microcosm study suggests the greatest removal of PHC fraction F2 and F3. Disadvantages:
		 Requires chemical inputs that must be controlled to avoid adverse effects on nearby water bodies (introduction of ammonium, phosphates and potential increase of nitrates into the environment).
		May take longer to remediate due to short growing season and cool soil temperature.
		May have issues getting nutrients deep enough into the soil
		Surfactant Soil Washing : On-site set-up to agitate soils in a surfactant solution (or water) to remove PHCs.
		Advantages:
		Can be less time-consuming than bioremediation and natural treatment systems.
		Best suited for coarse-grained soils, like those at Old Windy Camp.
		Disadvantages:
		Chemical inputs can disrupt soil properties and nutrient cycling. Table also were the control of the cont
		 Technology produces a liquid stream that that must be treated separately. Resulting treated soil typically requires dewatering prior to backfilling, as it has little to
		no bearing strength post-treatment.

Summary of Remediation Options for Boston Camp Soils

Areas	Predominant Hydrocarbon Fraction Requiring Treatment	Remedial Alternative
		Large manpower and energy requirements
		Monitored Natural Attenuation : In-situ a remediation approach including variety of physical, chemical, or biological processes that can act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil.
		Advantages:
		 Minimizes or avoids air and land emissions, tundra damage, and non-renewable resource depletion.
		Good alternative for areas that are difficult to access (soils under buildings or wetlands).
		Allows cleanup workers to avoid contact with contaminated soils.
		Less equipment and labor than most methods.
		Less expensive.
		 Sampling and testing over years can be costly, but it may still cost less than other methods.
		Disadvantages:
		Remedial timeframe may be protracted.
		 Difficult to demonstrate in advance that approach will work. For this reason, approach may not be acceptable to stakeholders.

One potential issue while remediating AEC 2 may be the free water at 1 m. The dominant underlying soil is sand ranging from fine to coarse sand, which may have a hydraulic conductivity ranging from 10^{-5} to 10^{-3} m/s. This may influence the type of remediation undertaken due to the movement of impacted water and amendments used in remediation. The direction of this water may be north (Aimaokatalok Lake approximately 185 m) to north east (Stickleback Lake approximately 115 m).

Approximately, 348 m³ of soils with BTEX, F1 to F3 hydrocarbon fraction concentrations were identified, of which 100 m³ of the impacted soil is already in a landfarm. This is the estimated volume of soils that was greater than the Nunavut PHC guidelines for industrial land use.

Based on the evaluation of the impacted areas (AEC 2 and APEC 1), the remediation options above, and the outcome of the soil analysis for PHC, the preferred remedial approach for the Site would be landfarming. The SiREM study of the Patch and Windy Camps suggests that the aerobic bioremediation of fraction F2 impacted soils would be effective. The impacted material would need to be turned periodically for aeration of the soil and have fertilizer amendments, such as urea (46-0-0) and monoammonium phosphate (11-52-0). Both nitrogen and phosphorus have been shown to increase microbial degradation of PHC (Braddock et al. 1997; Thomassin-Lacroix et al. 2002). Landfarming AEC 2 could cause additional issues, since the area would likely need to be excavated to at least 2 m below grade and would expose the free water.

The probable range of remedial cost for the landfarming is estimated to range between \$140,000 and \$210,000, with a remedial timeframe of two to three treatment seasons. This estimate was based on the costs provided in EBA (2010), but it does not include permitting costs, engineering costs, and periodic engineering effort to monitor and sample the water and soils at the facility.

6.0 RECOMMENDATIONS

Based on the outcomes of this Phase III ESA, the following recommendations apply to the Site:

- AEC 2 (248 m³ of impacted soil) should be remediated using land farming with fertilizers and tilling.
 The SiREM study suggests that the bioremediation of fraction F2 impacted soils by undisturbed, aerobic techniques would be effective.
- APEC 1 (100 m³ of impacted soil) can be remediated in-situ as it is already in a landfarm. This area should be turned periodically with a nutrient amendment to increase biodegradation of PHC.
- Further investigation underneath the pad at AEC 1, AEC 3 and APEC 5 are still required.
- Any fuel remaining in aboveground storage tanks on the Site should be collected and disposed of, in accordance with Nunavut regulations, in order to prevent any possible further hydrocarbon soil impacts.
- Further investigation into the high salinity values in the groundwater monitoring wells and surface water.
- Water quality in the groundwater monitoring wells should be continued to be monitored yearly.

7.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

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Attachments: Tables (8)

Figures

Appendix A: Borehole Logs

Appendix B: Laboratory Analytical Results

Appendix C: General Conditions

THE ASSOCIATION OF PROFESSIONAL ENGINEERS, GEOLOGISTS and GEOPHYSICISTS OF THE NORTHWEST TERRITORIES

PERMIT NUMBER P 018

EBA ENGINEERING CONSULTANTS LTD.

REFERENCES

- Braddock F. Joan, Marian L. Ruth and Peter H. Catterall. 1997. Enhancement and inhibition of microbial activity in hydrocarbon-contaminated arctic soils: implications for nutrient-amended bioremediation. Environmental science and Technology 31:7, 2078-2084
- CCME, September 2007, Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health.
- CCME (2008a) Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil, Endorsed by CCME Council of Ministers in 2001, Table 1 Revised January 2008. http://www.ccme.ca/assets/pdf/phc_standard_1.0_e.pdf
- CCME (2008b) Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil: Scientific Rationale Supporting Technical Document. PN 1399. http://www.ccme.ca/assets/pdf/pn_1399_phc_sr_std_1.2_e.pdf
- CCME (Canadian Council of Ministers of the Environment). 2007. Canadian water quality guidelines for the protection of aquatic life: summary table. Update 7.1, December 2007. In: Canadian Environmental Quality Guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg, MB.
- CCME (Canadian Council of Ministers of the Environment). 2011. Canadian water quality guidelines for the protection of aquatic life: Chloride. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.
- Dyke, A.S., and Dredge, L.A. 1989. Quaternary geology of the northwestern Canadian Shield. In Quaternary geology of Canada and Greenland. Edited by R.J. Fulton. Geological Survey of Canada, Ottawa.
- Dyke, A.S. and Prest, V.K. 1986. Late Wisconsin and Holocene retreat of the Laurentide Ice Sheet. Geological Survey of Canada, Map 1702A.
- Diamond, M.L., Page, C.A., Campbell, M., McKenna, S., and Lall, R. 1999. Life-cycle framework for assessment of site remediation options: method and generic survey. Environ. Toxicol. Chem. 18, 788–800.
- EBA, 1996. Boston Gold Project, Surficial Geology and Permafrost Features.
- EBA, 2004. Hydrocarbon Spill Assessment and Remediation Boston Camp, Nunavut. Submitted to Miramar Mining Corporation.
- EBA, 2010 Evaluation Of Risk And Remedial Options for Petroleum Hydrocarbon Impacted Soils at Patch Lake Facility and Windy Lake Camp, Hope Bay Gold Project, Nunavut. Issued for Review.
- Geological Survey of Canada. 2003. Geology of the Doris North Gold Deposits, Northern Hope Bay Volcanic Belt, Slave Structural Province, Nunavut; Carpenter, R. L.; Sherlock, R. L.; Quang, C.; Kleespies, P.; McLeod, R.; Geological Survey of Canada, Current Research 2003-C6, 2003.
- Government of Nunavut. 2009. Environmental Guideline for Contaminated Site Remediation. Department of Sustainable Development Environmental Protection Service.

- Heginbottom, J.A., Dubreuil, M.A. and Harker, P.A., 1995. Canada Permafrost, In: National Atlas of Canada, 5th Edition, National Atlas Information Service, Natural Resources Canada, MCR 4177
- Hope Bay Mining Limited Phase 2 Hope Bay Belt Project. December 2011.
- Rescan Environmental Services Ltd. 2009. Meteorology Baseline Report, Hope Bay Belt Project, Proj#1009-002-02/Rev C.1, December 2009.
- SRK Consulting (Canada) Inc. 2009. Hope Bay Mining Ltd.-Water and Ore/Waste Rock Management Plan for the Boston Site, Hope Bay Project Nunavut, Prepared for Hope Bay Mining Ltd.
- SRK Consulting (Canada) Inc. 2012. Hope Bay Project-Boston Camp Revised Interm Closure Plan, Prepared for Hope Bay Mining Ltd.
- SiREM. 2012. Laboratory Biotreatability Study To Assess Aerobic and Anaerobic Biodegradation of Petroleum Hydrocarbons at Two Sites in Nunavut, Northern Canadian Site. Ref# TL00307B. Prepared for EBA Engineering.
- Thomassin-Lacroix E.J.M, M. Eriksson, K.J. Reimer and W.W Mohn. 2002. Biostimulation and bioaugmentation for on-site treatment of weathered diesel fuel in Arctic soil. Applied Microbiology and Biotechnology 59, 551-556
- WESA, 2009, Hope Bay Gold Project: Phase II Environmental Site Assessment of Patch Lake Workshop, Windy Camp, and Boston Soil Treatment Area.

TABLES

Table I	Soil Analytical Results for Hydrocarbons at AEC 1 (Old Spill Area)
Table 2	Soil Analytical Results for Hydrocarbons at AEC 2 (Generator Spill)
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Table 1: Soil Analytical Results For Hydrocarbons at AEC 1 (Old Spill Area)

Sample Number	Sample Depth (m)	BTEX and Hydrocarbon Fractions F1 to F4 (mg/kg)								
		Benzene	Toluene	Ethylbenzene	Xylene	F1 (C6-C10)	F2 (>C10-C16)	F3 (>C16-C34)	F4 (>C34-C50)	Grain Size (% >75 μm)
AEC 1 - 2	0.25 to 0.50	<0.005	<0.02	<0.01	<0.04	<12	<10	15	<10	-
AEC 1 - 3	0.25 to 0.50	<0.005	<0.02	<0.01	<0.04	<12	88	38	<10	-
AEC 1 - 3	0.50 to 0.75	<0.005	<0.02	<0.01	<0.04	<12	16	<10	<10	64
AEC 1 - 5	0.25 to 0.50	<0.005	<0.02	<0.01	<0.04	<12	<10	<10	<10	-
AEC 1 - 7	0.20 to 0.40	<0.005	<0.02	<0.01	<0.04	<12	<10	17	<10	-
AEC 1 - 13	0.50 to 0.75	<0.005	<0.02	<0.01	<0.04	<12	<10	48	13	-
AEC 1 - 14	0.25 to 0.50	<0.005	<0.02	<0.01	<0.04	<12	<10	83	23	-
AEC 1 - 15	0.50 to 0.75	<0.005	<0.02	<0.01	<0.04	<12	<10	67	46	-
AEC 1 - 16	0.50 to 0.75	<0.005	<0.02	<0.01	<0.04	<12	16	<10	<10	-
AEC 1 - 17	0.75 to 1.00	<0.005	<0.02	<0.01	<0.04	<12	<10	<10	<10	-
AEC 1 - 18	0.75 to 1.00	<0.005	<0.02	<0.01	<0.04	<12	<10	31	<10	-
AEC 1 - 19	0.25 to 0.50	<0.005	<0.02	<0.01	<0.04	<12	<10	74	11	-
AEC 1 - 20	0.50 to 0.75	<0.005	<0.02	<0.01	<0.04	<12	<10	22	<10	-
AEC 1 - 21	0.75 to 1.00	<0.005	0.35	<0.01	<0.04	<12	<10	78	23	-
Environmental Guideline for Contaminated Site Remediation - Nunavut (Coarse- Grain) ₁	-	0.03	0.37	0.082	11	240	260	1,700	3,300	-
CCME Soil Quality Guideline for the Protection of Environmental and Human Health ²	٠	0.03	0.37	0.082	11	320	260	1,700	3,300	-

Notes:

Bold = Greater than the referenced guideline

¹ Environmental Guidelines for Contaminated Site Remediation, Nunavut, for Industrial, coarse-grained soil

² CCME Soil Quality Guideline for the Protection of Environmental and Human Health, for Industrial, coarse-grained soil

³ All soil samples were collected on August 9, 2011

^{- =} Not detected/not analyzed/no unit/no guidelines

Table 2: Soil Analytical Results For Hydrocarbons at AEC 2 (Generator Spill)

Sample Number	Sample Depth (m)	BTEX and Hydrocarbon Fractions F1 to F4 (mg/kg)								
		Benzene	Toluene	Ethylbenzene	Xylene	F1 (C6-C10)	F2 (>C10-C16)	F3 (>C16-C34)	F4 (>C34-C50)	Grain Size (% >75 μm)
AEC 2 - 1	0.75 to 1.00	0.034	2.00	7.300	<u>100</u>	5,800	11,000	1,700	14	-
AEC 2 - 1	1.50 to 1.75	0.087	<u>1.8</u>	<u>9.1</u>	<u>55</u>	3,100	6,000	680	<10	-
AEC 2 - 2	0.75 to 1.00	<0.005	<0.02	<0.01	<0.04	<12	<10	<10	<10	-
AEC 2 - 3	1.25 to 1.50	0.077	0.59	2.8	<u>35</u>	<u>530</u>	<u>4,100</u>	800	28	-
AEC 2 - 4	0.50 to 0.70	<0.005	<0.02	<0.012	<0.04	150	<u>1,800</u>	600	<10	-
AEC 2 - 5	0.75 to 1.00	0.009	0.11	0.032	0.16	<12	<10	<10	<10	-
AEC 2 - 6	0.75 to 1.00	<0.005	<0.02	<0.01	<0.04	<12	<10	<10	17	61
AEC 2 - 7	0.75 to 1.00	<0.005	<0.02	0.013	0.079	<12	41	<10	<10	-
AEC 2 - 8	0.75 to 1.00	<u>0.13</u>	4.3	3.9	<u>34</u>	<u>670</u>	<u>7,600</u>	1,500	50	-
invironmental Guideline for Contaminated Site mediation - Nunavut (Coarse- Grain) ₁	-	0.03	0.37	0.082	11	240	260	1,700	3,300	-
CME Soil Quality Guideline for the Protection of Environmental and Human Health ²	-	0.03	0.37	0.082	11	320	260	1,700	3,300	-

Notes:

Bold = Greater than the referenced guideline

¹ Environmental Guidelines for Contaminated Site Remediation, Nunavut, for Industrial, coarse-grained soil

² CCME Soil Quality Guideline for the Protection of Environmental and Human Health, for Industrial, coarse-grained soil

³ All soil samples were collected on August 9, 2011

^{- =} Not detected/not analyzed/no unit/no guidelines

Table 3: Soil Analytical Results For Hydrocarbons at AEC 3 (Tank Farm Perimeter)

Sample Number	Sample Depth (m)	BTEX and Hydrocarbon Fractions F1 to F4 (mg/kg)								
		Benzene	Toluene	Ethylbenzene	Xylene	F1 (C6-C10)	F2 (>C10-C16)	F3 (>C16-C34)	F4 (>C34-C50)	Grain Size (% >75 μm)
AEC 3 - 1	0.75 to 1.00	<0.005	<0.02	<0.01	<0.04	<12	<10	65	16	-
AEC 3 - 3	0.25 to 0.50	<0.005	<0.02	<0.01	<0.04	<12	<10	74	28	75
AEC 3 - 5	0.75 to 1.00	<0.005	<0.02	<0.01	<0.04	<12	<10	18	<10	-
Environmental Guideline for Contaminated Site Remediation - Nunavut (Coarse- Grain) ₁		0.03	0.37	0.082	11	240	260	1,700	3,300	-
CCME Soil Quality Guideline for the Protection of Environmental and Human Health ²		0.03	0.37	0.082	11	320	260	1,700	3,300	-

Notes:

Bold = Greater than the referenced guideline

¹ Environmental Guidelines for Contaminated Site Remediation, Nunavut, for Industrial, coarse-grained soil

² CCME Soil Quality Guideline for the Protection of Environmental and Human Health, for Industrial, coarse-grained soil

³ All soil samples were collected on August 9, 2011

^{- =} Not detected/not analyzed/no unit/no guidelines

Table 4: Soil Analytical Results For Hydrocarbons at AEC 6 (Incinerator)

	Sample Depth (m)	BTEX and Hydrocarbon Fractions F1 to F4 (mg/kg)								
Sample Number		Benzene	Toluene	Ethylbenzene	Xylene	F1 (C6-C10)	F2 (>C10-C16)	F3 (>C16-C34)	F4 (>C34-C50)	
AEC 6 - 2	0.75 to 1.00	<0.005	<0.02	<0.01	<0.04	<12	<10	27	<10	
AEC 6 - 4	0.75 to 1.00	<0.005	<0.02	<0.01	<0.04	<12	<10	190	60	
Environmental Guideline for Contaminated Site Remediation - Nunavut (Coarse- Grain) ₁	-	0.03	0.37	0.082	11	240	260	1,700	3,300	
CCME Soil Quality Guideline for the Protection of Environmental and Human Health ²	-	0.03	0.37	0.082	11	320	260	1,700	3,300	

Notes:

¹ Environmental Guidelines for Contaminated Site Remediation, Nunavut, for Industrial, coarse-grained soil

² CCME Soil Quality Guideline for the Protection of Environmental and Human Health, for Industrial, coarse-grained soil

All soil samples were collected on August 9, 2011

^{- =} Not detected/not analyzed/no unit/no guidelines

Table 5: Soil Analytical Results For Hydrocarbons at APEC 1 (Land Farm Perimeter)

	Sample Depth (m)			ВТІ	EX and Hydrocarbon F	Fractions F1 to F4 (mg	/kg)			Soil Texture
Sample Number		Benzene	Toluene	Ethylbenzene	Xylene	F1 (C6-C10)	F2 (>C10-C16)	F3 (>C16-C34)	F4 (>C34-C50)	Grain Size (% >75 μm)
APEC 1 - 1	0.25 to 0.50	<0.005	<0.02	<0.01	<0.04	<12	<10	280	150	-
APEC 1 - 3	0.25 to 0.50	<0.005	<0.02	<0.01	<0.04	<12	<10	<10	<10	-
APEC 1 - 4	0.50 to 0.75	<0.005	<0.02	<0.01	<0.04	<12	<10	10	<10	61
APEC 1 - 6	0.25 to 0.50	<0.005	<0.02	<0.01	<0.04	<12	<10	<10	<20	-
Environmental Guideline for Contaminated Site Remediation - Nunavut (Coarse- Grain) ₁		0.03	0.37	0.082	11	240	260	1,700	3,300	-
CCME Soil Quality Guideline for the Protection of Environmental and Human Health ²		0.03	0.37	0.082	11	320	260	1,700	3,300	-

Notes:

¹ Environmental Guidelines for Contaminated Site Remediation, Nunavut, for Industrial, coarse-grained soil

² CCME Soil Quality Guideline for the Protection of Environmental and Human Health, for Industrial, coarse-grained soil

³ All soil samples were collected on August 9, 2011

^{- =} Not detected/not analyzed/no unit/no guidelines

Table 6: Soil Analytical Results For Hydrocarbons at APEC 1 (Inside Land Farm)

	Sample Depth (m)	BTEX and Hydrocarbon Fractions F1 to F4 (mg/kg)								
Sample Number		Benzene	Toluene	Ethylbenzene	Xylene	F1 (C6-C10)	F2 (>C10-C16)	F3 (>C16-C34)	F4 (>C34-C50)	
Inside Land Farm 1	0.30 to 0.50	0.33	<u>25</u>	<u>17</u>	<u>140</u>	<u>5,300</u>	47,000	9,600	230	
Inside Land Farm 3	0.30 to 0.50	<0.005	<0.02	<0.01	<0.04	76	2,700	1,400	27	
Inside Land Farm 5	0 to 0.15	<0.005	0.045	0.014	<0.04	<12	2,700	2,100	76	
Environmental Guideline for Contaminated Site Remediation - Nunavut (Coarse- Grain) ₁	-	0.03	0.37	0.082	11	240	260	1,700	3,300	
CCME Soil Quality Guideline for the Protection of Environmental and Human Health ²	-	0.03	0.37	0.082	11	320	260	1,700	3,300	

Notes:

¹ Environmental Guidelines for Contaminated Site Remediation, Nunavut, for Industrial, coarse-grained soil

² CCME Soil Quality Guideline for the Protection of Environmental and Human Health, for Industrial, coarse-grained soil

³ All soil samples were collected on August 9, 2011

^{- =} Not detected/not analyzed/no unit/no guidelines

Table 7: Soil Analytical Results For Hydrocarbons at APEC 5 (Retention Pond Perimeter)

Sample Number	Sample Depth (m)	BTEX and Hydrocarbon Fractions F1 to F4 (mg/kg)								Soil Texture
		Benzene	Toluene	Ethylbenzene	Xylene	F1 (C6-C10)	F2 (>C10-C16)	F3 (>C16-C34)	F4 (>C34-C50)	Grain Size (% >75 μm)
APEC 5 - 1	0.25 to 0.50	<0.005	<0.01	<0.02	<0.04	<12	<10	28	<10	-
APEC 5 - 2	0.50 to 0.75	<0.005	<0.01	<0.02	<0.04	<12	<10	120	33	44
APEC 5 - 3	0.25 to 0.50	<0.005	<0.01	<0.02	<0.04	<12	<10	180	52	-
Environmental Guideline for Contaminated Site Remediation - Nunavut (Coarse- Grain) ₁		0.03	0.37	0.082	11	240	260	1,700	3,300	-
CCME Soil Quality Guideline for the Protection of Environmental and Human Health ²	-	0.03	0.37	0.082	11	320	260	1,700	3,300	-

Notes:

¹ Environmental Guidelines for Contaminated Site Remediation, Nunavut, for Industrial, coarse-grained soil

² CCME Soil Quality Guideline for the Protection of Environmental and Human Health, for Industrial, coarse-grained soil

³ All soil samples were collected on August 9, 2011

^{- =} Not detected/not analyzed/no unit/no guidelines

Table 8: Groundwater and Surface Water Analytical Results for Hydrocarbons and Routine Water at Boston Camp

			1 ! NI-							
Test Parameter	Unit	CCME ¹	Licence No. 2BB-BOS1217	GW-1 Boston	GW-2 Boston	GW-3 Boston	GW-4 Boston	GW-5 Boston	Seep Sample 1	Seep Sample 2
BTEX and Hydrocarbon Fractions F1 to F2										
Benzene	mg/L	0.370	0.370	<0.00040	< 0.00040	<0.00040	< 0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.002	0.002	<0.00040	< 0.00040	<0.00040	<0.00040	< 0.00040	<0.00040	< 0.00040
Ethylbenzene	mg/L	0.090	0.090	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	<0.00040
Xylenes	mg/L	-	-	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6 - C10)	mg/L	-	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10 - C16)	mg/L	-	-	<0.30 (1)	<0.80 (1)	<0.80 (1)	<0.80 (1)	<0.30 (1)	<0.30 (1)	<0.30 (1)
Routine Water and Diss. Regulated Metals Misc. Inorganics										
Conductivity	uS/cm			3800	_	3000	-	11000	3000	2400
pH	u3/ciii	6.5 to 9	6.0-9.5	7.46	-	7.21	-	6.76	7.19	7.11
Routine Water and Diss. Regulated Metals		6.5 (0 9	6.0-9.5	7.40		7.21	-	0.76	7.19	7.11
Calculated Parameters										
Anion Sum	meq/L	_		36	-	29		110	29	22
Cation Sum	meq/L	-	-	36	-	28	-	95	30	24
Hardness (CaCO ₃)	mg/L	-	-	1500	-	1200	-	2900	1300	1000
Ion Balance	- Ilig/L	-	-	0.99	-	0.97	-	0.86	1.1	1.1
Dissolved Nitrate (N)	mg/L	-	-	0.47	-	19 (4)	-	0.11 (3)	36 (4)	0.008 (5)
Dissolved Nitrate (NO ₃)	mg/L	13	-	2.1	-	83		0.49	160	0.035
Nitrate plus Nitrite (N)	mg/L	-	-	0.47 (2)	-	19	-	0.11	36	0.008
Dissolved Nitrite (N)	mg/L	-	-	<0.015 (2)	-	0.054 (3)	-	<0.030 (2)	0.012 (5)	<0.0030 (5)
Dissolved Nitrite (NO ₂)	mg/L	0.06	-	<0.049		0.18	-	<0.099	0.039	< 0.0099
Total Dissolved Solids	mg/L	-	-	2000		1700	-	5700	1800	1300
Routine Water and Diss. Regulated Metals										
Anions			ı							
Alkalinity (PP as CaCO ₃)	mg/L	-	-	< 0.50		< 0.50	-	<0.50	<0.50	< 0.50
Alkalinity (Total as CaCO ₃)	mg/L	-	-	54		24	-	180	24	17
Bicarbonate (HCO ₃)	mg/L	-	-	66	-	29	-	220	29	21
Carbonate (CO ₃)	mg/L	-	-	< 0.50		< 0.50	-	<0.50	<0.50	<0.50
Hydroxide (OH)	mg/L	-	-	< 0.50	-	<0.50	-	<0.50	< 0.50	<0.50
Dissolved Sulphate (SO ₄)	mg/L	-	-	200		510 (1)	-	310 (1)	470 (1)	260 (1)
Dissolved Chloride (CI)	mg/L	120	-	1100 (1)		590 (1)	-	3600 (1)	560 (1)	580 (1)
Routine Water and Diss. Regulated Metals	1		I							
Elements										
Dissolved Aluminum (AI)	mg/L	-	-	-		-	-	-	-	-
Dissolved Antimony (Sb)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Arsenic (As)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Barium (Ba)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Beryllium (Be)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Boron (B)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Cadmium (Cd) Dissolved Calcium (Ca)	mg/L	-	-	400	-	340	-	390	380	280
Dissolved Carcium (Ca) Dissolved Chromium (Cr), Trivalent	mg/L mg/L	-	-	-	-	-	-	-	-	-
Dissolved Cobalt (Co)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Copper (Cu)	mg/L	-	-	-		-			-	-
Dissolved Iron (Fe)	mg/L	0.3	-	0.22	-	0.53	-	0.71	0.17	0.45
Dissolved Lead (Pb)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Lithium (Li)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Magnesium (Mg)	mg/L		-	120	-	76	-	480 (1)	83	80
Dissolved Manganese (Mn)	mg/L	-	-	1.4	-	0.94	-	2.5	0.41	0.2
Dissolved Molybdenum (Mo)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Nickel (Ni)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Phosphorus (P)	mg/L	-	-			-	-	- :	-	-
Dissolved Potassium (K)	mg/L	-	-	9.7	-	30	-	44	29	2.5
Dissolved Selenium (Se)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Silicon (Si) Dissolved Silver (Ag)	mg/L mg/l		-		-		-	-	-	
Dissolved Solium (Na)	mg/L mg/L	-	-	130		100	-	810 (1)	86	76
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Strontum (SI)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Thallium (TI)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Titanium (Ti)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Uranium (U)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Vanadium (V)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Zinc (Zn)	mg/L	-	-	-		-			_	-

Notes:

- Notes:

 ¹ Canadian Water Quality Guidelines for Protection of Aquatic Life Freshwater

 ² = Not detected/not analyzed/no unit/no guidelines

 (1) Detection Limit raised based on sample volume used for analysis or due to dilution to bring analyte within calibrated range

 (2) Detection Limits raised due to matrix interference Sample was analyzed after holding time expired.

 (3) Detection limits raised due to sample matrix. Sample was analyzed after holding time expired

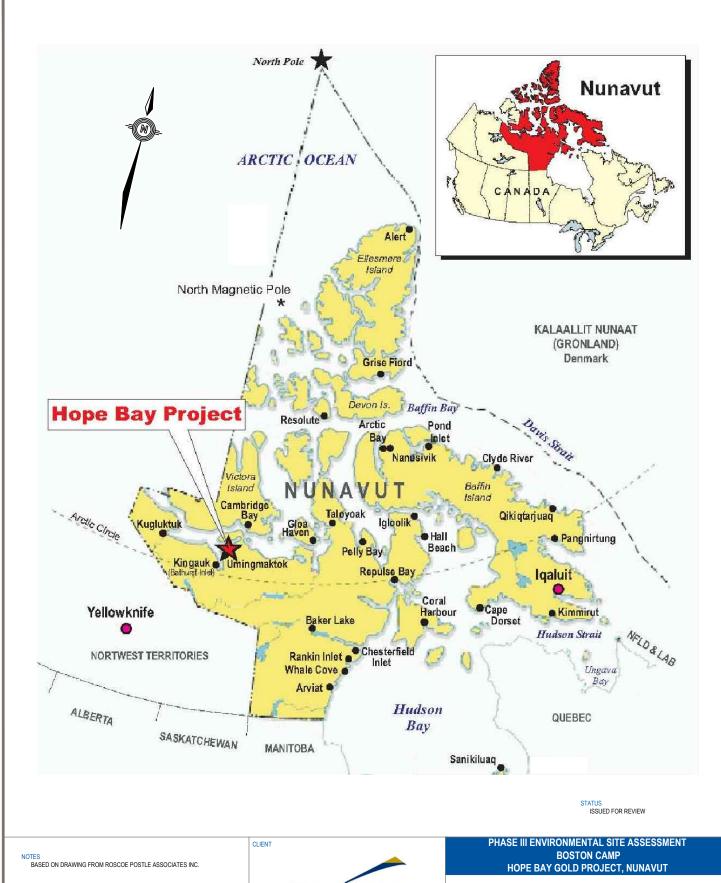
 (4) Detection Limit raised due to dilution to bring analyte within calibrated range. Sample was analyzed after holding time expired.

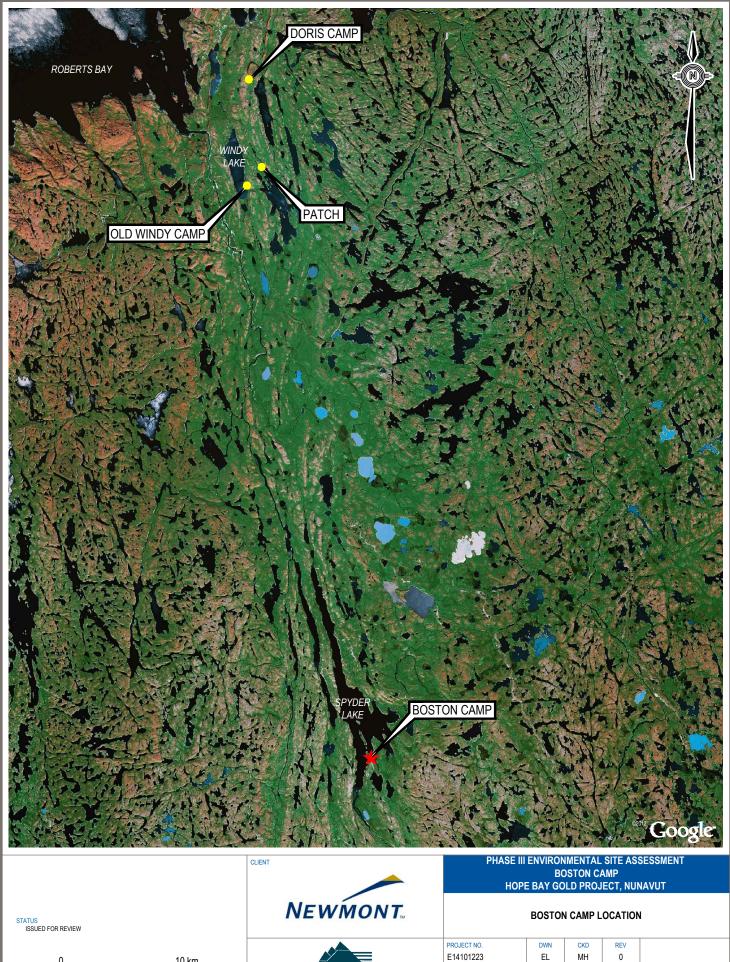
 (5) Sample was analyzed after holding time expired.

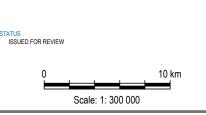
FIGURES

Figure I	Hope Bay Project Location
Figure 2	Boston Camp Location
Figure 3	Boston Camp Site Details
Figure 4	Boston Camp Study Locations
Figure 4Ai	AEC I - Old Spill Area
Figure 4Aii	AEC I - Old Spill Area
Figure 4B	AEC 2 - Generator Spill
Figure 4C	AEC 3 - Tank Farm Perimeter
Figure 4D	AEC 6 - Incinerator
Figure 4E	APEC I - Land Farm Perimeter
Figure 4F	APEC I - Inside Land Farm
Figure 4G	APEC 5 - Retention Pond Perimeter
Figure 5	Groundwater and Surface Water Sampling Locations





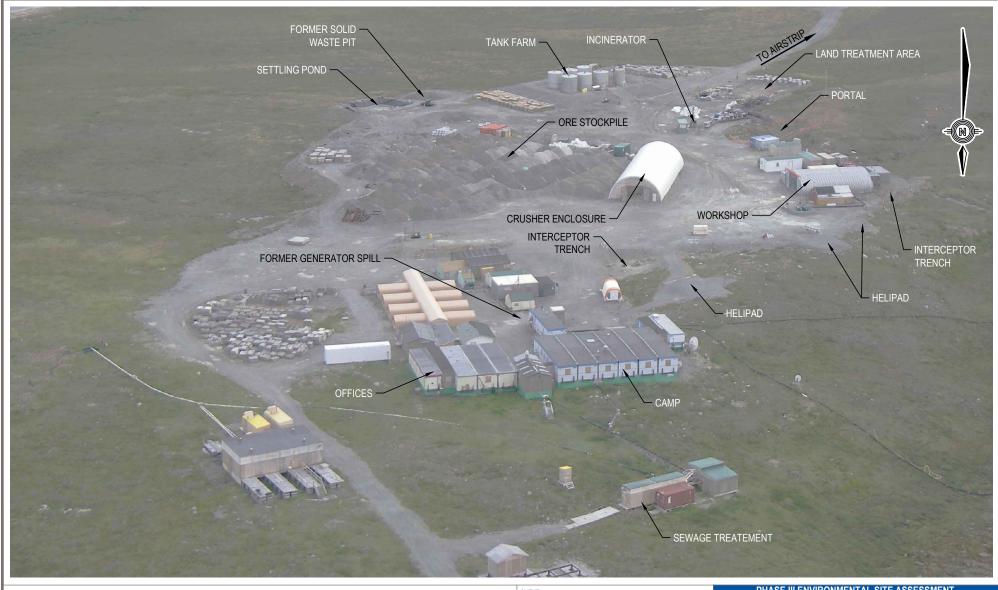




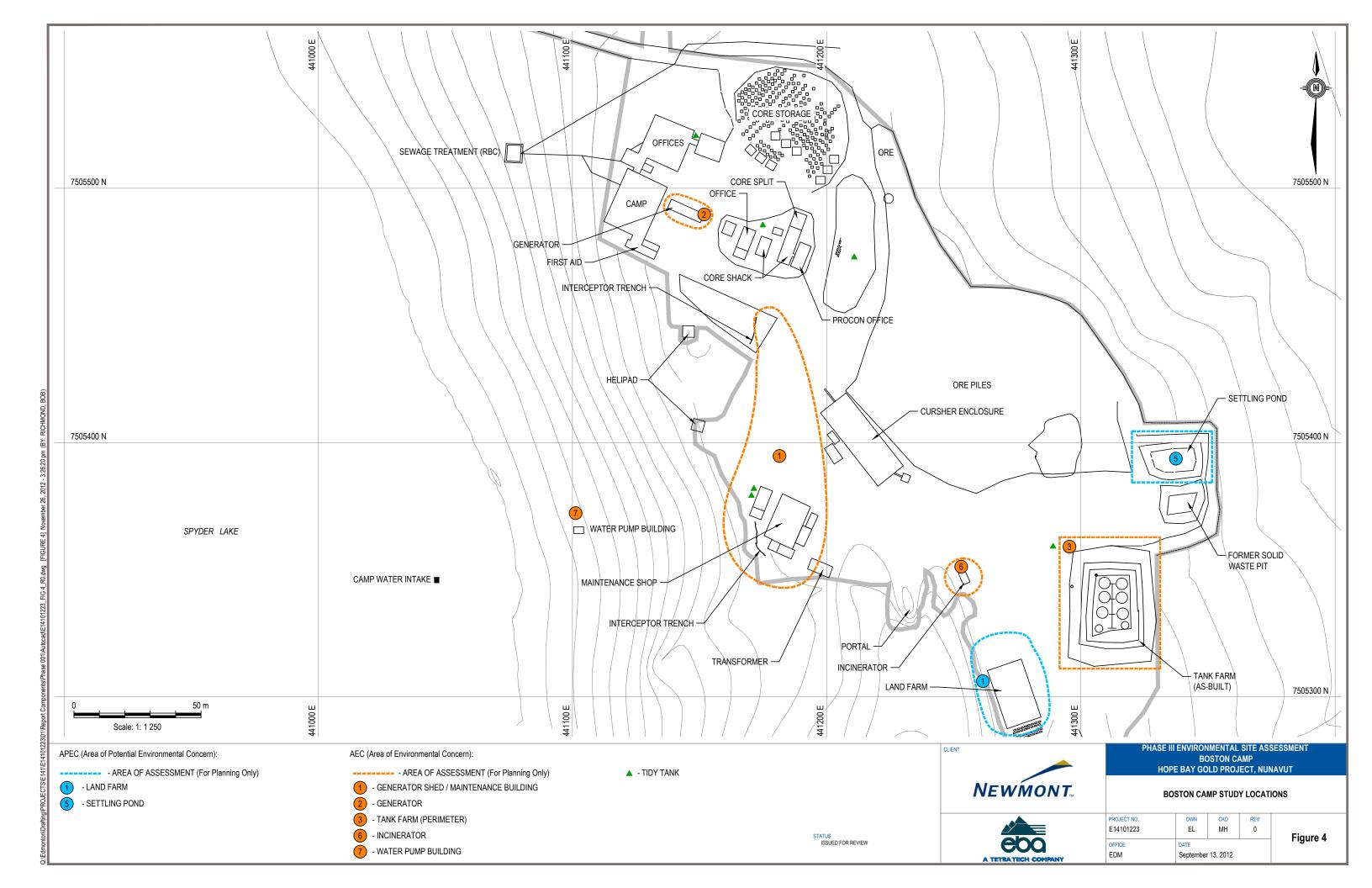
ebo
A TETRATECH COMPANY

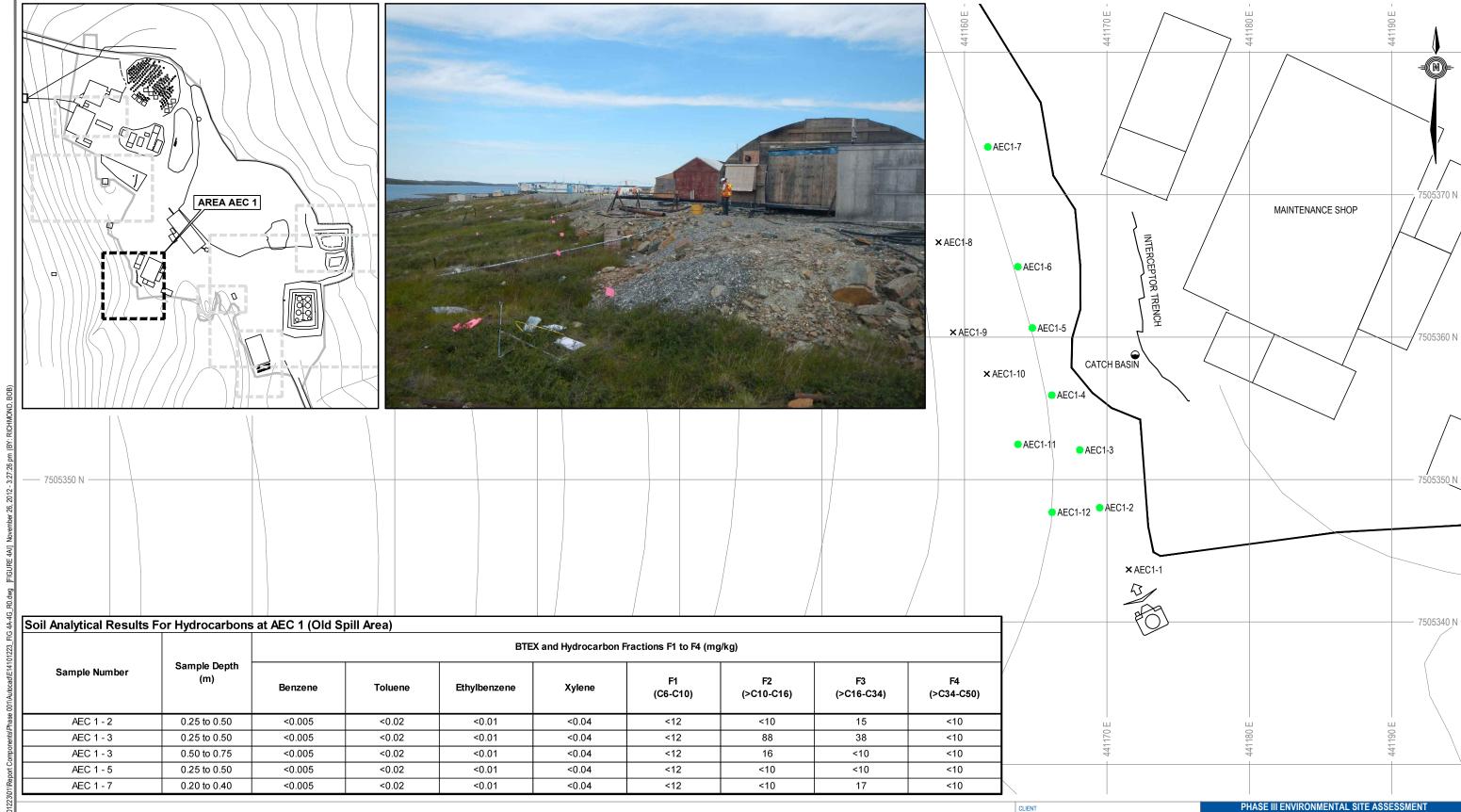
PROJECT NO.	DWN	CKD	REV
E14101223	EL	MH	0
OFFICE EDM	DATE September	2012	

Figure 2









LEGEND

- × SOIL SCREENING POINT
- - SAMPLE BELOW TIER 1 ENVIRONMENTAL GUIDELINE FOR CONTAMINATED SITE REMEDIATION (INDUSTRIAL)
- - SAMPLE ABOVE TIER 1 ENVIRONMENTAL GUIDELINE FOR CONTAMINATED SITE REMEDIATION (INDUSTRIAL)

Scale: 1: 250

- NOTES

 GPS POINTS WERE COLLECTED IN UTM WITH NAD83 DATUM, ZONE 13, METER; CENTRAL MERIDIAN 105d W.
- BOLD AND UNDERLINED: VALUE GREATER THAN THE INDUSTRIAL GUIDELINE
- DEPTH SHOWN IS IN METRES BELOW BELOW GRADE



BOSTON CAMP HOPE BAY GOLD PROJECT, NUNAVUT

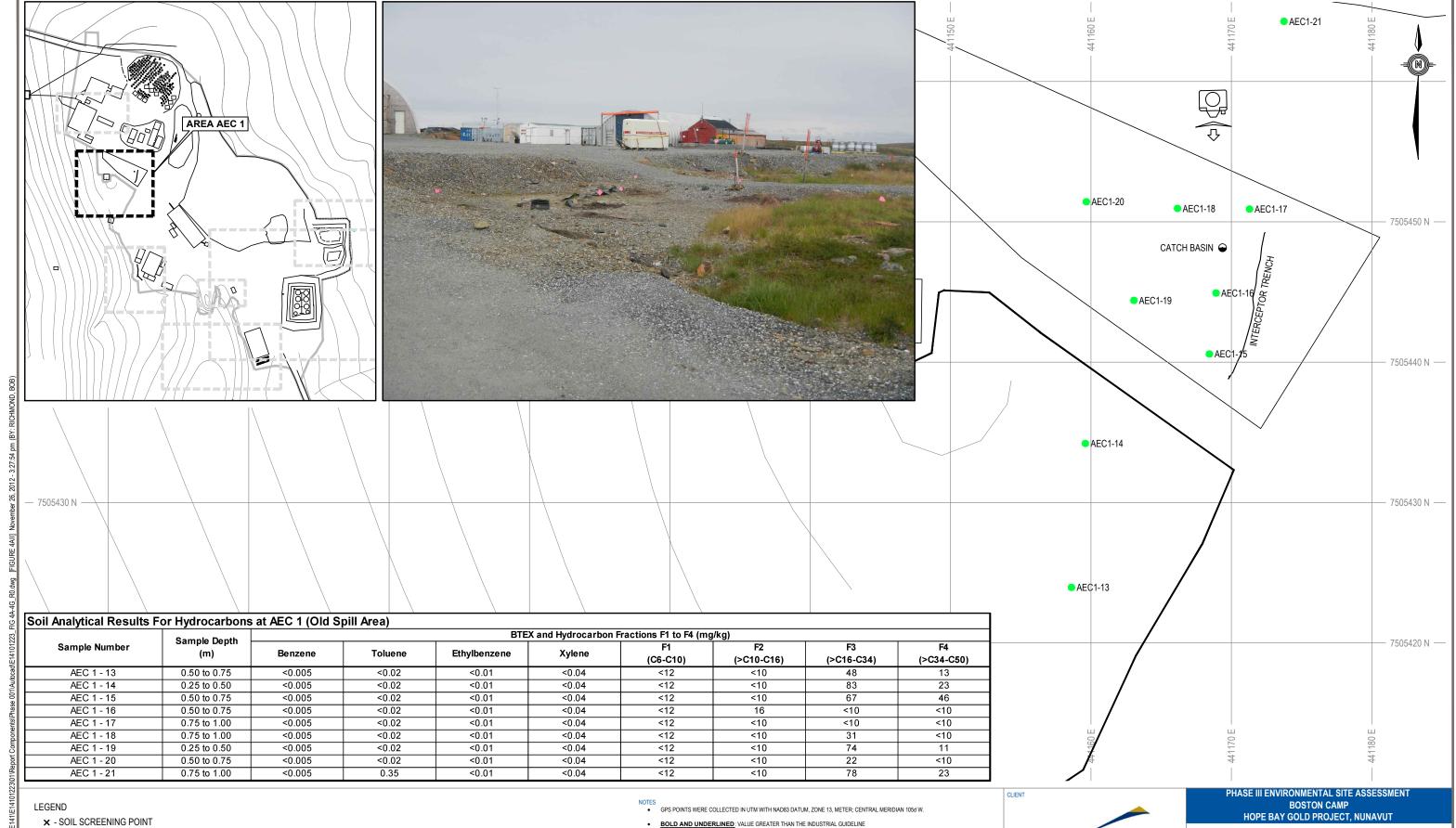
AEC 1 - OLD SPILL AREA

Figure 4Ai



PROJECT NO.	DWN	CKD	REV			
E14101223	EL	MH	0			
OFFICE	DATE					
EDM	September 7, 2012					

STATUS ISSUED FOR REVIEW



Scale: 1: 250

• - SAMPLE BELOW TIER 1 ENVIRONMENTAL GUIDELINE FOR CONTAMINATED SITE REMEDIATION (INDUSTRIAL)

● - SAMPLE ABOVE TIER 1 ENVIRONMENTAL GUIDELINE FOR CONTAMINATED SITE REMEDIATION (INDUSTRIAL)

DEPTH SHOWN IS IN METRES BELOW BELOW GRADE

NEWMONT...

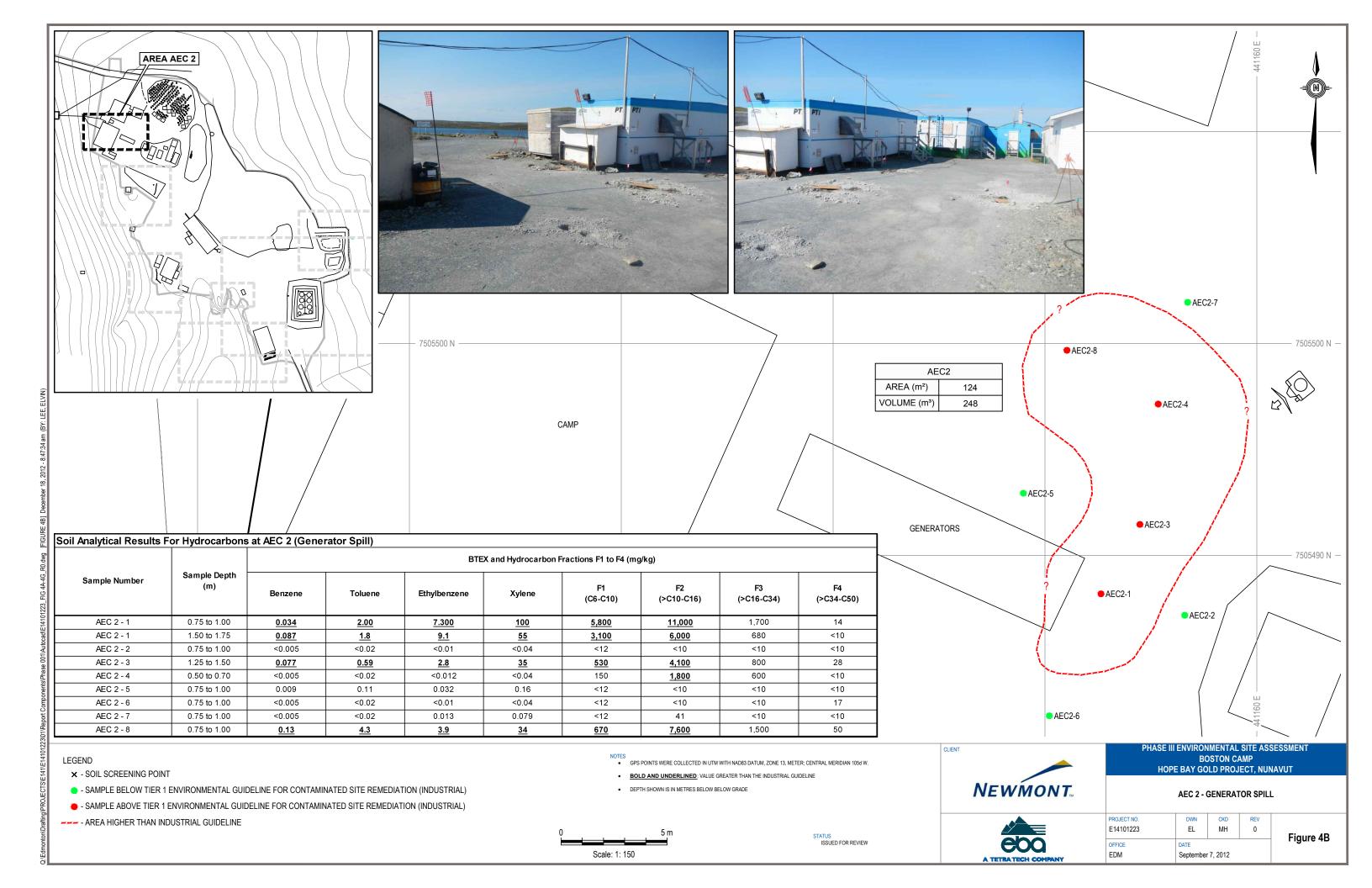
AEC 1 - OLD SPILL AREA

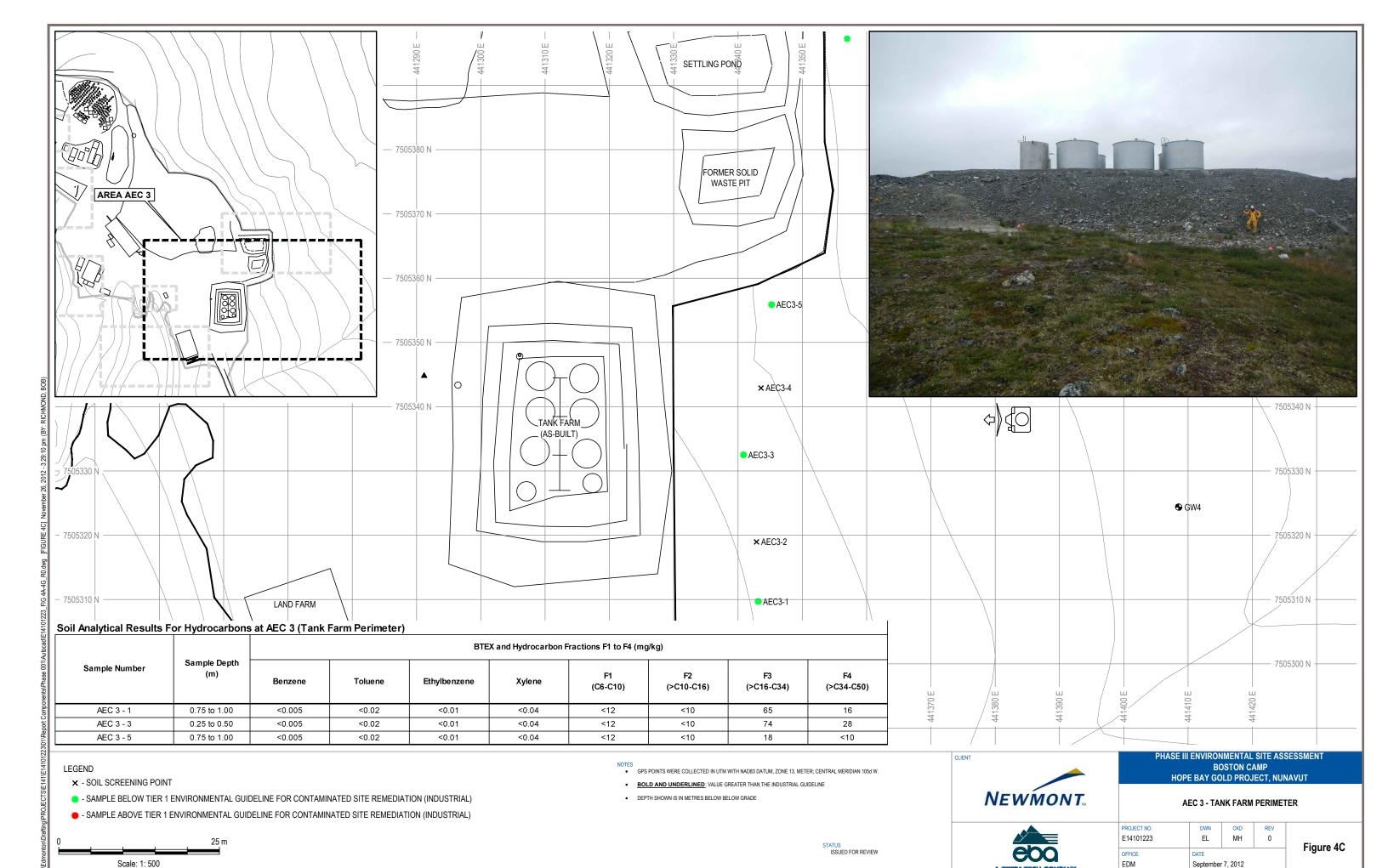
Figure 4Aii



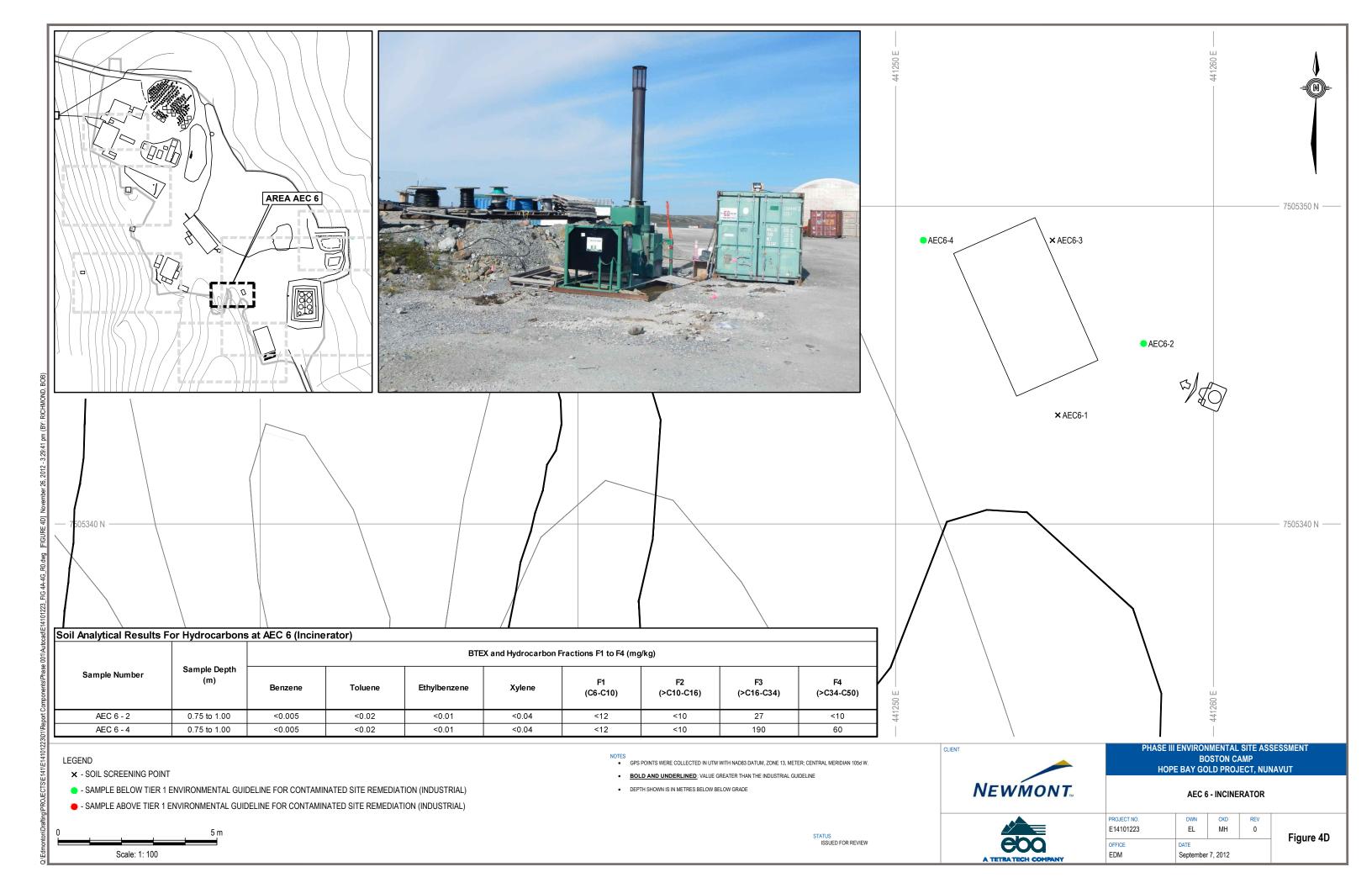
PROJECT NO. E14101223 EL OFFICE DATE September 7, 2012

STATUS ISSUED FOR REVIEW





September 7, 2012





- - SAMPLE BELOW TIER 1 ENVIRONMENTAL GUIDELINE FOR CONTAMINATED SITE REMEDIATION (INDUSTRIAL)
- - SAMPLE ABOVE TIER 1 ENVIRONMENTAL GUIDELINE FOR CONTAMINATED SITE REMEDIATION (INDUSTRIAL)

Scale: 1: 250

DEPTH SHOWN IS IN METRES BELOW BELOW GRADE

STATUS ISSUED FOR REVIEW

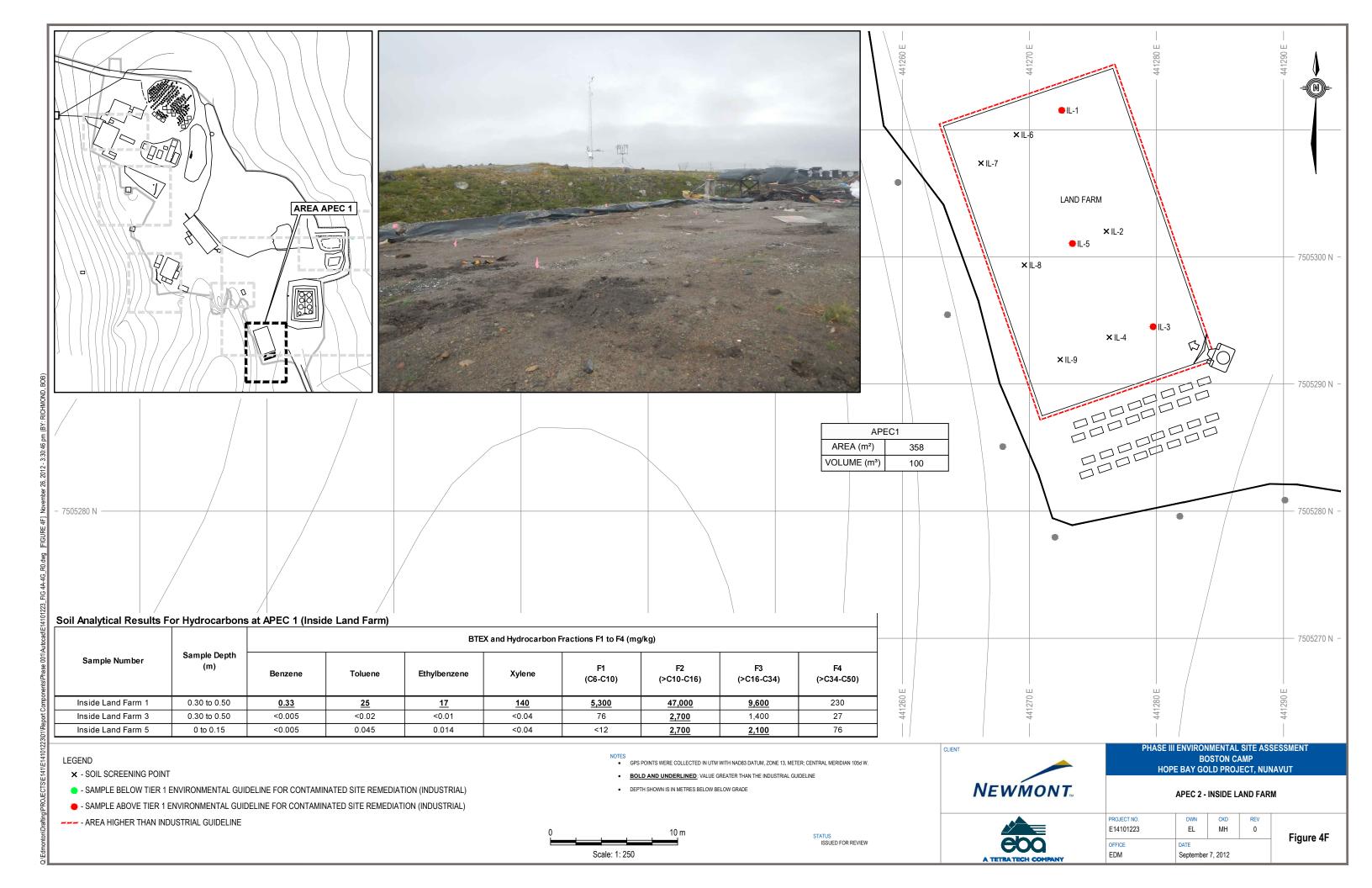


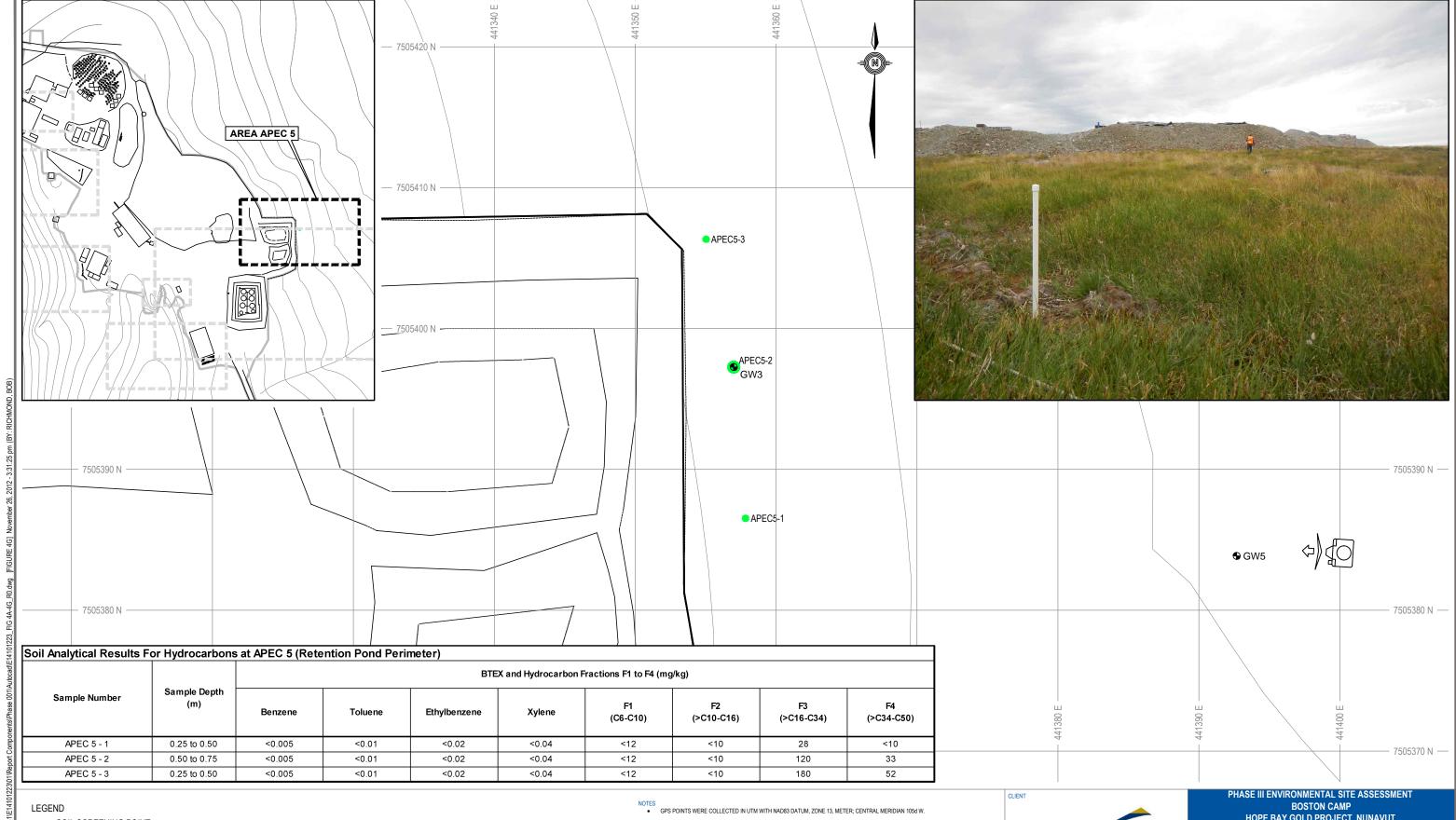
APEC 1 - LAND FARM PERIMETER



E14101223	EL	MH	0				
OFFICE	DATE						
EDM	September 7, 2012						

Figure 4E





- × SOIL SCREENING POINT
- - SAMPLE BELOW TIER 1 ENVIRONMENTAL GUIDELINE FOR CONTAMINATED SITE REMEDIATION (INDUSTRIAL)
- - SAMPLE ABOVE TIER 1 ENVIRONMENTAL GUIDELINE FOR CONTAMINATED SITE REMEDIATION (INDUSTRIAL)

Scale: 1: 250

- BOLD AND UNDERLINED: VALUE GREATER THAN THE INDUSTRIAL GUIDELINE
- DEPTH SHOWN IS IN METRES BELOW BELOW GRADE



BOSTON CAMP HOPE BAY GOLD PROJECT, NUNAVUT

APEC 5 - RETENTION POND PERIMETER



PROJECT NO.	DWN	CKD	REV			
E14101223	EL	MH	0			
OFFICE	DATE					
EDM	September 7, 2012					
	E14101223 OFFICE	E14101223 EL OFFICE DATE	E14101223 EL MH OFFICE DATE	E14101223 EL MH 0 OFFICE DATE		

Figure 4G

STATUS ISSUED FOR REVIEW

OFFICE

EDM

DATE

September 13, 2013

APPENDIX A BOREHOLE LOGS



PHAS	E 3 ENVIRON	MENTAL SITE	ASSESSMENT	HOPE BAY MINING LIMITED					PROJECT NO BOREHOLE NO.		
AEC1				DRILL: HAND AUGER	₹				E14101223-AEC1-01		
HOPE	BAY										
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY X SPT		CASING		BY TUBE	CORE		
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	GF	ROUT	DRILL	LL CUTTINGS 📆 SAND			
Depth (m)			SOIL ESCRIPTION		SAMPLETYPE	◆PIDR	EADING (ppm) ◆ 20 30 40	•	NOTES & COMMENTS	Depth (ft)	
1	SAND (TILL) - graded, I	EHOLE (0.59 metreed due to auger refu	medium gravel, fine town	elack, roots, (30 mm thick) n medium grained, poorly						5	
4		<u> </u>				D BY: TH		CON	MPLETION DEPTH: 0.5	9 m	
(eba					/ED BY: N	<u>ИВ</u> 4101223-01		MPLETE: 12/08/08 e 1 of 1		
A TETRA	A TECH COMPANY				UKAVVII	VL 1VL) 14	+101/25-01	12206	: I OL I		

PHASI	E 3 ENVIRONN	MENTAL SITE	ASSESSMENT	HOPE BAY MINING L	IMITED	PROJECT NO BOREHOLE NO				
AEC1				DRILL: HAND AUGE	R				E14101223-AEC1-02	
HOPE	BAY									
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀 SPT		-CASING	SHEL	BY TUBE	CORE	
BACKI	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	G G	ROUT	DRILL	CUTTINGS	S SAND	
Depth (m)			SOIL ESCRIPTION		SAMPLE TYPE	◆PID I	READING (ppm) 4 20 30 40		NOTES & COMMENTS	Depth (ft)
-			ts, (210 mm thick)		•	Y				0
-	grained, n	noist, loose, dark y	ellowish brown, few ro	e of clay, fine to medium ots	•	>				_
-	END OF BOREF Note: Stopped	HOLE (0.46 metre d due to auger refu	es) Isal.							_
-										_
_ 1										_
-										_
-										5
-										_
2										7 -
É	DO				REVIE\	NED BY: THE		COM	PLETION DEPTH: 0.4 PLETE: 12/08/08	ŀ6 m

PHAS	E 3 ENVIRONI	MENTAL SITE A						PROJECT NO BOREHOLE NO.					
AEC1				DRILL:	HAND AUG	ER						E14101223-AEC1-03	
HOPE	BAY												
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-C	ASING			LBY TU		
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L I	SLOUGH	٥٠	GR	TUC		DRIL	L CUT	TINGS SAND	
Depth (m)			SOIL SCRIPTION				SAMPLE TYPE	◆PID 10	READI 20	NG (ppm) 30 40		NOTES & COMMENTS	Depth (ft)
0	SILT (ORGANIC	C) - silty, sandy, dam	p, soft, black, roots, ((110 mm th	nick)								0
-	poorly gra	aded, damp, loose, y	nedium gravel, trace ellowish brown, few ned, wet, diesel odou	roots	e to medium gra	ained,			•				_
-		v											-
-													_
_ 1	END OF BORE	HOLE (1.00 metre)	al				.,						_
-													_
-													_
-													5
-													_
2													7 -
<u> </u>								BY: T				COMPLETION DEPTH: 1 r	n
A TETR	A TECH COMPANY							ED BY		223-03		COMPLETE: 12/08/08 Page 1 of 1	
A PETRA	THAT CONTANT					IUKA	v v I I \	UNU.	14 IU	ZZJ-UJ	- 1	FAUCTULI	

AEC1 HOPE BAY SAMPLE TYPE DISTURBED NO RECOVERY SPT A-CASING SHELBY TUBE CORE BACKFILL TYPE BENTONITE PEA GRAVEL SLOUGH SOIL DESCRIPTION O SAND (TILL) - some silt, medium to coarse grained, well graded, damp, loose, yellowish brown, (40 mm thick)	Depth (ft)
SAMPLE TYPE DISTURBED NO RECOVERY SPT A-CASING SHELBY TUBE CORE BACKFILL TYPE BENTONITE PEA GRAVEL SLOUGH SOIL DESCRIPTION O SAND (TILL) - some silt, medium to coarse grained, well graded, damp, loose, yellowish	
BACKFILL TYPE BENTONITE PEA GRAVEL SLOUGH GROUT DRILL CUTTINGS SAND SOIL DESCRIPTION O SAND (TILL) - some silt, medium to coarse grained, well graded, damp, loose, yellowish	
SOIL DESCRIPTION SAND (TILL) - some silt, medium to coarse grained, well graded, damp, loose, yellowish	
DESCRIPTION O SAND (TILL) - some silt, medium to coarse grained, well graded, damp, loose, yellowish	
0 SAND (TILL) - some silt, medium to coarse grained, well graded, damp, loose, yellowish	0
SILT (ORGANIC) - sandy, trace of clay, fine to medium grained sand, damp, soft, black,	_
few roots, (90 mm thick)	
SAND (TILL) - silty, trace of clay, medium to coarse grained, well graded, damp, loose, yellowish brown, (300 mm thick)	
SILT (ORGANIC) - silty, sandy, some clay, fine grained sand, well graded, moist, loose,	
low plastic, black, roots, (120 mm thick)	
SAND (TILL) - some silt, trace of fine to medium grained, trace of clay, fine to medium	
grained, well graded, moist END OF BOREHOLE (0.62 metres)	-
Note: Stopped due to auger refusal.	
_ 1	
	-
	-
	_
	5
2	7 -
LOGGED BY: TH COMPLETION DEPTH: 0	62 m
REVIEWED BY: MB COMPLETE: 12/08/08 DRAWING NO: 14101223-04 Page 1 of 1	

PHAS	E 3 ENVIRONI	MENTAL SITE	ASSESSMENT							PROJECT NO BOREHOLE NO.				
AEC1				DRILL:	HAND AUGEI	R							E14101223-AEC1-05	
HOPE	BAY													
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-CA	ASING			SHEL	BY TU	JBE CORE	
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L	SLOUGH	0	GRC	UT			DRILL	. CUT	TINGS SAND	
Depth (m)		DE	SOIL ESCRIPTION			S A M D	SAMPLE ITPE	◆PID 10) REA 20	DING (ppm) ∢ 40	•	NOTES & COMMENTS	Depth (ft)
0	SILT (ORGANIC	c) - some fine grain	ed sand, trace of clay,	well grade	d, moist, soft, low	'								0
	SAND (TILL) - s	ack, roots, (70 mm ome silt, trace of cl	tnick) ay, trace of fine to med	dium grave	I, occasional cobb	oles			: :		: :	:		
-	to 95 mm	diameter, fine to m	ay, trace of fine to med edium grained, moist,	soft, yellow	ish brown		·							-
-														
-														_
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-														
-	END OF BORE	HOLE (0.60 metre	es) sal											_
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-														-
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2	<u> </u>					LOGG	ED.	EV∙ T	Н	: :	: :	:	COMPLETION DEPTH: 0.6	7 - 3 m
													COMPLETE: 12/08/08	וווע
A TETRA	TECH COMPANY			REVIEWED BY: MB DRAWING NO: 14101223										

PHASI	E 3 ENVIRONI	MENTAL SITE A	ASSESSMENT							PROJECT NO BOREHOLE NO.				
AEC1				DRILL:	HAND AUG	ER							E14101223-AEC1-06	
HOPE	BAY													
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-C	ASING			SHELE	BY TU	UBE CORE	
BACKI	FILL TYPE	BENTONITE	PEA GRAVE	- 🎹	SLOUGH	٠٥٠	GR	OUT			DRILL	CUT	TINGS SAND	
Depth (m)		DE	SOIL ESCRIPTION				SAMPLE TYPE	◆PID 10	REAL 20		opm) ◆ 40		NOTES & COMMENTS	Depth (ft)
0	SILT (ORGANIC	C) - silty, sandy, trac and, damp, soft, bla	ce of fine to medium gr	ained, trac	e of clay, fine							:		0
_	SAND (TILL) - s	ilty, trace of clay, tr	ace of fine to medium	gravel, fine	to medium gra	ined,								
-	moist, loo	se, yellowish browr	n, few roots				•							_
							•							
-	END OF DODE	1015 /0.40 motro												
	Note: Stoppe	HOLE (0.40 metre d due to auger refu	sal.											_
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2						1.00) DV: T	<u> </u>	<u> </u>	<u> </u>			7 -
								BY: T					COMPLETION DEPTH: 0.4 COMPLETE: 12/08/10	· m
A TETRA	TECH COMPANY			REVIEWED BY: MB DRAWING NO: 14101223-										

PHASI	E 3 ENVIRONI	MENTAL SITE	ASSESSMENT						PROJECT NO BOREHOLE NO.		
AEC1				DRILL: HAND AUGE	₹			E	14101223-AEC1-07		
HOPE	BAY										
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY SPT	A-	CASING	SHEL	BY TUBE	CORE		
BACKI	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	G G	ROUT	DRILL	. CUTTINGS	SAND		
Depth (m)			SOIL ESCRIPTION		SAMPLE TYPE	◆PID F 10	READING (ppm) 4 20 30 40		NOTES & COMMENTS	Depth (ft)	
0 <u> </u> -	SAND (TILL) - s	ome silt, trace of c	ce of nine gravel, traces, (30 mm thick) lay, trace of fine to meets, loose, yellowish bro	of clay, fine grained sand, dium gravel, fine to coarse wn, few roots		•				0	
-	END OF BORE	HOLE (0.42 metre	es)		•	>					
-	Note: Stopped	d due to`auger refu	ısal.								
-										-	
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-										_	
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-										5	
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-										_	
2					1000	D BY: TH		COM	DI ETION DEDTU. O	7 -	
É	DO COMPANY				REVIEV	VED BY:		COMPLETION DEPTH: 0.42 m COMPLETE: 12/08/10			

PHAS	E 3 ENVIRONN	MENTAL SITE A	ASSESSMENT	HOPE BAY MINING LI		PROJECT NO BOREHOLE NO.				
AEC1				DRILL: HAND AUGEF	₹			E1410	1223-AEC1-08	
HOPE	BAY									
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY SPT	A	-CASING	SHEL	BY TUBE (CORE	
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	Ğ G	ROUT	DRILL	CUTTINGS 👯	SAND	
Depth (m)			SOIL ESCRIPTION	I	SAMPLE TYPE	◆PID F 10	READING (ppm) • 20 30 40	NO	TES & MENTS	Depth (ft)
-	SILT (ORGANIC graded, m SAND (TILL) - s brown, roo	ilty, trace of clay, tr	ce of clay, trace of fine ots, (30 mm thick) ace of gravel, well gra	gravel, fine grained sand, we						0
-	END OF BOREI Note: Stopped	HOLE (0.38 metre d due to auger refu	s) sal.		Ī					-
-										-
_ 1										_
-										5
-										-
2	•			ı	LOGGE	D BY: TH		COMPLETI	ON DEPTH: 0.3	7 - 8 m
A TETRA	TECH COMPANY				REVIE	NED BY: I		COMPLETE Page 1 of 1	E: 12/08/10	- III

PHAS	E 3 ENVIRON	MENTAL SITE	ASSESSMENT	HOPE BAY MINING LIMITED					PROJECT NO BOREHOLE NO.			
AEC1				DRILL: HAND AUGER	₹				E14101223-AEC1-09			
HOPE	BAY											
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY SPT		-CASING	SHEL	BY TUBE	CORE			
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	ß G	ROUT	DRILL	CUTTING	S SAND			
Depth (m)		DE	SOIL ESCRIPTION		SAMPLE TYPE	◆PID 10	READING (ppm) • 20 30 40	•	NOTES & COMMENTS	Depth (ft)		
0	black, roo	ts, (70 mm thick)		vel, well graded, damp, soft, ded, moist, loose, yellowish						0		
-	brown, fe	w roots		ded, moist, loose, yellowish						_		
_	END OF BORE Note: Stoppe	HOLE (0.47 metre d due to auger refu	es) isal.									
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Ê	ebo				REVIE \	D BY: TH WED BY:	MB	COMPLETION DEPTH: 0.47 m COMPLETE: 12/08/10				
A TETRA	ATECH COMPANY				DRAWI	NG NO:	14101223-09					

PHAS	E 3 ENVIRON	MENTAL SITE A	ASSESSMENT							PROJECT NO BOREHOLE NO		
AEC1				DRILL: HAN	ND AUGER						E14101223-AEC1-10	
HOPE	BAY											
SAMP	LE TYPE	DISTURBED	NO RECOVE		_		-CASING		SHEL	BY TUE		
BACK	FILL TYPE	BENTONITE	PEA GRAVE	SLC	OUGH [ه G	ROUT		DRILL	CUTTI	NGS 👯 SAND	
Depth (m)		DE	SOIL ESCRIPTION			SAMPLE TYPE	◆PIE 10	READIN 20	G (ppm) 4 30 40	•	NOTES & COMMENTS	Depth (ft)
0	SILT (ORGANIC) - some sand, trac	ce of clay, trace of grav	el, dry, soft, da	rk brown, roots,							0
_	\ (40 mm th	ilty, some fine to m	edium gravel, trace of yellowish brown, few r	clay, fine to me	dium grained,	ا ا						
	poorly gra	ided, moist, loose,	yellowish brown, few r	pots	,	•						_
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-						•	>					_
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-												_
_ 1	END OF BORE	HOLE (1.00 metre	e) sal									
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2	<u> </u>				10)GGF	D BY: 1	<u> </u>	· · · · · ·	C	OMPLETION DEPTH: 1 r	7 - n
<u> </u>	200									COMPLETE: 12/08/10		
A TETRA	A TECH COMPANY			REVIEWED BY: MB DRAWING NO: 14101223-1					23-10	Page 1 of 1		

PHAS	E 3 ENVIRONI	MENTAL SITE	ASSESSMENT						PROJECT NO BOREHOLE NO.			
AEC1				DRILL: HAND AUGEF	₹				E14101223-AEC1-11			
HOPE	BAY											
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY XPT	A	-CASING	SHEL	BY TUBE	CORE			
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	Ğ G	ROUT	DRILL	CUTTING	SS 👯 SAND			
Depth (m)		DE	SOIL ESCRIPTION		SAMPLE TYPE	◆PID F 10	READING (ppm) • 20 30 40	•	NOTES & COMMENTS	Depth (ft)		
0	SILT (ORGANIC	c) - sandy, trace of	clay, dry, loose, black,	roots, (70 mm thick)						0		
-	SAND (TILL) - s grained, n	ome silt, trace of ci noist, loose, yellow	lay, trace of fine to med ish brown, roots	dium gravel, fine to medium	•					-		
_ 1 _	END OF BOREI Note: Stopper	HOLE (1.00 metre	e) isal.			TO DV. TU			MDI ETION DEDTIL: 1.4	5		
				LOGGED BY: TH					MPLETION DEPTH: 1 r	n		
A TETRA	TECH COMPANY			REVIEWED BY: MB DRAWING NO: 14101223-					COMPLETE: 12/08/10 1 Page 1 of 1			

PHAS	E 3 ENVIRON	MENTAL SITE A	ASSESSMENT	T HOPE BAY MINING LIMITED						PROJECT NO BOREHOLE NO			
AEC1				DRILL:	HAND AUGI	ΞR					E14101223-AEC1-12		
HOPE	BAY												
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		-CASING			BY TUE			
BACK	FILL TYPE	BENTONITE	PEA GRAVE	- 📗	SLOUGH	[o] (ROUT		DRILL	. CUTTI	INGS 👯 SAND		
Depth (m)			SOIL ESCRIPTION			SAMPLE TYPE	◆PIE 10	READI 20	NG (ppm) 4 30 40	>	NOTES & COMMENTS	Depth (ft)	
0 1	SAND (TILL) - grained,	ots, (30 mm thick) some silt. trace of cl	ce of clay, fine to coars ay, trace of fine to med t, loose, light yellowish ss) sal.	dium grave	·	se,	→ → → → → → → → → →	TH			COMPLETION DEPTH: 0.8	0	
4											COMPLETE: 12/08/10	III U	
A TETR	TECH COMPANY			REVIEWED BY: MB DRAWING NO: 14101223									

PHAS	E 3 ENVIRON	MENTAL SITE	ASSESSMENT	HOPE BAY MINING LIMITED					PROJECT NO BOREHOLE NO.		
AEC1				DRILL: POWER AUG	ER .				E14101223-AEC1-13		
HOPE	BAY										
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY XPT	A	-CASING	SHE	LBY TUB	E CORE		
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	Č C	ROUT	DRIL	L CUTTIN	NGS 👯 SAND		
Depth (m)		DE	SOIL ESCRIPTION		SAMPLETYPE	◆PID 10	D READING (ppm) 20 30 4	• 0	NOTES & COMMENTS	Depth (ft)	
0	SILT (ORGANIC graded, m	C) - silty, sandy, tra- noist, soft, black, ro	ce of clay, fine to mediots, (90 mm thick)	um grained sand, poorly						0	
1	SAND (TILL) - s mm diame roots	ilty, some fine to m	edium gravel, trace of arse grained, well grad	clay, trace of cobbles to 150 led, loose, yellowish brown, fe	9W						
-										5	
2						ED BY: T		CO	OMPLETION DEPTH: 0.7	7 - 5 m	
Ē	bo				REVIE	WED BY	: MB	C	COMPLETE: 12/08/10		
A TETRA	TECH COMPANY				DRAW	ING NO:	14101223-13	P₂	age 1 of 1		

PHASE	E 3 ENVIRONMENTAL SITE ASSESSM	MENT HOPE BAY MINING L	IMITED	PROJECT NO BOREHOLE NO.			
AEC1		DRILL: POWER AUG	SER	E14101223-AEC1-14			
HOPE	BAY						
SAMPI	PLE TYPE DISTURBED NO	RECOVERY SPT	A-CASI	A-CASING SHELBY TUBE CORE			
BACK	FILL TYPE BENTONITE PE	A GRAVEL SLOUGH	GROUT	DRILL	CUTTINGS 👯 SAND		
Depth (m)	SOII DESCRIF	- PTION	SAMPLE TYPE	▶PID READING (ppm) ◆ 10 20 30 40	NOTES &	Depth (ft)	
	SILT (ORGANIC) - silty, sandy, some clay, trac cobbles to 180 mm diameter, fine to med black, roots(220 mm thick)		•			0	
-	SAND (TILL) - some silt, some medium to coar diameter, medium to coarse grained, we	se gravel, trace of cobbles to 250 mm I graded, yellowish brown, roots				_	
-	END OF BOREHOLE (0.50 metres) Note: Stopped due to auger refusal.					_	
-						_	
_ 1						_	
-						_	
-						5	
-						_	
- 2						7 -	
É	200		REVIEWED		COMPLETION DEPTH: 0.5 m COMPLETE: 12/08/10 Page 1 of 1		

PHASE 3 ENVIRONMENTAL SITE ASSESSMENT HOPE BAY MINING L							PROJECT NO BOREHOLE NO.		
AEC1		DRILL: POWER AUGE	R		E14101223-AEC1-15				
HOPE BAY									
SAMP	PLE TYPE DISTURBED	RY SPT A-CASING S			SHELI	HELBY TUBE CORE			
BACKFILL TYPE BENTONITE PEA GRAVE			L SLOUGH	GF	ROUT	DRILL	CUTTINGS	S SAND	
Depth (m)	DES	I	◆PID READING (ppm 10 20 30 4		EADING (ppm) ◆ 20 30 40	• (NOTES & COMMENTS	Depth (ft)	
0	GRAVEL (FILL) - trace of fine to medi poorly graded, moist, dense, green states and grained (20 mm thick) SAND (TILL) - sitty, some fine to medi mm diameter, fine to medium green states and grained mm diameter. Stopped due to auger refusal note: Stopped due to auger refusal	sand, trace of clay, um gravel, trace of rained, loose, yellov	40 mm thick) , moist, soft, black, diesel odou	9,					5
2				LOCCE	יוד יעם ח		00014	DI ETION DEDTU A 7	7 -
É	200		LOGGED BY: TH REVIEWED BY: MB DRAWING NO: 14101223-15				COMPLETION DEPTH: 0.75 m COMPLETE: 12/08/10 Page 1 of 1		
A TETRA	A TECH COMPANY			DKAWII	VC= IV(): 14	+101223-15	⊥ ⊦age	LOUL	

PHASE 3 ENVIRONMENTAL SITE ASSESSMENT				HOPE BAY MINING LIMITED				PROJECT NO BOREHOLE NO.			
AEC1				DRILL: POWER AUGER					E14101223-AEC1-16		
HOPE BAY											
SAMPLE TYPE DISTURBED NO RECOVE				RY SPT	A-CASING SHE			LBY TUBE CORE			
BACKFILL TYPE BENTONITE PEA GRAVE				L SLOUGH	GROUT DR			CUTTING	S SAND		
Depth (m)	SOIL DESCRIPTION				SAMPLE TYPE	⊒d H H			NOTES & COMMENTS	Depth (ft)	
- S	coarse, moist, co	ompact, grey, diesendy, silty, some clayots, diesel odour, (ince of medium to control or medi	ol odour, (240 mi , fine grained sa 20 mm thick)	sand, trace of clay, medium to m thick) and, well graded, wet, low casional cobbles, fine to wn, diesel odour						0	
1						D BY: TH			MPLETION DEPTH: 0.7	5	
A TETRATECH COMPANY					REVIEWED BY: MB DRAWING NO: 14101223-16				COMPLETE: 12/08/10 Page 1 of 1		

PHASE	E 3 ENVIRONI	MENTAL SITE	ASSESSMENT	HOPE BAY MINING LI	MITED			PRO	IECT NO BOREHOLE	ENO.
AEC1				DRILL: POWER AUGE	:R				E14101223-AEC1-17	
HOPE	BAY									
SAMPL	E TYPE	DISTURBED	NO RECOVE	RY SPT	A-	CASING	SHEL	BY TUBE	CORE	
BACKF	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	o GI	ROUT	DRILL	CUTTING	SS SAND	
Depth (m)	_	DI	SOIL ESCRIPTION		SAMPLE TYPE	◆PID1 10	READING (ppm) 4 20 30 40	•	NOTES & COMMENTS	Depth (ft)
-	GRAVEL (FILL) diesel odd	- some fine cobble our, (180 mm thick)	es, trace of clay, fine to	coarse, moist, compact, grey,		•				0
-	yellowish	ilty, trace of clay, fi brown, few roots, o ompact, low plastio	diesel odour	, moist, loose to compact,		•				_
-										_
-	- free water, s	heen on water								-
_ 1					10000					_
-	END OF DODE	U015 // 05			•	>				_
-	Note: Stoppe	HOLE (1.25 metre d due to auger refu	as) usal.							-
- - -										5
-										7 -
	TECH COMPANY				REVIEV	D BY: TH	H MB 14101223-17	COI	MPLETION DEPTH: 0.7 MPLETE: 12/08/10 le 1 of 1	

PHASE 3 ENVIRONMENTAL SITE ASSESSMENT							
AEC1	DRILL: POWER AUGE	ER .		E14101223-AEC1-18			
HOPE BAY							
SAMPLE TYPE DISTURBED NO RECOVE	RY X SPT	A-CASING	SHELBY T	TUBE CORE			
BACKFILL TYPE BENTONITE PEA GRAVE	_ SLOUGH	GROUT	DRILL CU	TTINGS 👯 SAND			
SOIL DESCRIPTION		→ PID READIN 10 20	G (ppm) ◆ 30 40	NOTES & COMMENTS	Depth (ft)		
0 GRAVEL AND COBBLES (FILL) - some medium to coars medium to coarse, poorly graded, dense, grey, die SILT (ORGANIC) - silty, some fine grained sand, trace of roots, diesel odour, (40 mm thick)	sel odour, (50 mm thick)				0		
SAND (TILL) - silty, some clay, trace of gravel, trace of comoist, loose, brown, diesel odour	bbles to 100 mm diameter,				-		
END OF BOREHOLE (1.00 metre) Note: Stopped due to auger refusal.					5		
2		LOGGED BY: TH REVIEWED BY: MB DRAWING NO: 141012	023_18	COMPLETION DEPTH: 1 n COMPLETE: 12/08/10	7 - 1		

PHASE 3 ENVIRONMENTAL SITE ASSESSMENT	HOPE BAY MINING LIN	/ITED			PROJECT NO BORE	HOLE NO.
AEC1	DRILL: POWER AUGE	R			E14101223-AEC	I-19
HOPE BAY						
SAMPLE TYPE DISTURBED NO RECOVE	RY SPT	A-	CASING	SHEL	BY TUBE CORE	
BACKFILL TYPE BENTONITE PEA GRAVEL	. SLOUGH	G G	ROUT	DRILL	CUTTINGS 👯 SAND	
SOIL DESCRIPTION		SAMPLE TYPE	◆PID 10	READING (ppm) • 20 30 40	NOTES &	Depth (ft)
GRAVEL AND COBBLE (FILL) - trace of clay, occasional fine to coarse gravel, fine cobbles, moist, compact,	boulders to 420 mm diameter grey, (280 mm thick)	•	• • • • • • • • • • • • • • • • • • •			0
SAND (TILL) - some silt, some fine to coarse gravel, trace medium to coarse grained, moist, loose, yellowish be	of fine cobbles, trace of clay, prown	•				_
END OF BOREHOLE (0.50 metres) Note: Stopped due to auger refusal.						_
-						-
_ 1						-
-						_
_						5
-						-
2	,					7 -
ebo	F	REVIE	D BY: T VED BY:		COMPLETION DEPTH COMPLETE: 12/08/10	H: 0.5 m

PHAS	E 3 ENVIRON	MENTAL SITE A	SSESSMENT	HOPE E	BAY MINING	LIMITED)				PR	OJECT NO BOREHO	LE NO.
AEC1 DRILL: POWI HOPE BAY					POWER AUG	R AUGER E14101223-AEC1-2)
	BAY												
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-CAS	SING		SHEL	BY TUE	BE CORE	
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L IIII	SLOUGH	[0]	GROU	T		DRILL	CUTTI	INGS SAND	
Depth (m)		_	SOIL SCRIPTION			AAMPI F TYPE			EADING 20 3	i (ppm) ◀ 0 40		NOTES & COMMENTS	Depth (ft)
0	SILT (ORGANI	C) - some fine graine	ed sand, moist, loose,	black, root	ts, (80 mm thick)								0
-	SAND (TILL) - s fine to co	silty, some medium t arse grained, moist,	o coarse gravel, trace loose, yellowish brow	e of clay, oo n, few root	ccasional cobble	s,							-
1	END OF BORE Note: Stoppe	HOLE (0.73 metres	s) sal.			LOGG	· · · · · · · · · · · · · · · · · · ·					OMPLETION DEPTH: 0	5
A TETRA	2 COORDINATE OF THE PROPERTY O						WED	D BY: N NO: 14		23-20	С	COMPLETE: 12/08/10 age 1 of 1	0 111

PHASE	3 ENVIRONN	MENTAL SITE	ASSESSMENT	HOPE BAY MINING L	IMITED			PROJ	ECT NO BOREHOLE	ENO.
AEC1				DRILL: POWER AUG	ER				E14101223-AEC1-21	
HOPE E	BAY									
SAMPLE	E TYPE	DISTURBED	NO RECOVE	RY SPT	A	-CASING	SHEL	BY TUBE	CORE	
BACKFI	ILL TYPE	BENTONITE	PEA GRAVEI	L SLOUGH	0 0	ROUT	DRILL	CUTTING	S SAND	
Depth (m)		DE	SOIL ESCRIPTION		SAMPLE TYPE		READING (ppm) 4 20 30 40	•	NOTES & COMMENTS	Depth (ft)
	SILT (ORGANIC roots, dies plastic, da SAND (TILL) - sa diesel odd	ey) - some fine to me el odour ndy, clayey, trace of rk brown, diesel od	edium grained sand, transfer of gravel, fine grained solour are to medium grained,	e grained sand, trace of clay, to 130 mm diameter, moist, area of clay, moist, loose, blar sand, moist, compact, low, moist, loose, yellowish brown, moist, loose, yellowish brown	ck,					5
					LOGG	ED BY: TH	1		MPLETION DEPTH: 1.1	
ē	ba				REVIE	WED BY:	MB	CON	MPLETE: 12/08/10	
A TETRATE	ECH COMPANY				DRAW	ING NO: 1	14101223-21	Page	e 1 of 1	

PHAS	E 3 ENVIRONMENTAL SITE ASSESSMENT	HOPE BAY MINING L	LIMITED	ı	PROJECT NO BOREHOLE	E NO.
GENE	RATOR #2	DRILL: POWER AUG	GER		E14101223-AEC2-01	
HOPE	BAY					
SAMP	LE TYPE DISTURBED NO RECOV	ERY XPT	A-CASING	SHELBY	TUBE CORE	
BACK	FILL TYPE 🔲 BENTONITE 💢 PEA GRAV	EL SLOUGH	GROUT	DRILL CU	ITTINGS SAND	
Depth (m)	SOIL DESCRIPTIO		HAPPID REA 10 20	DING (ppm) ◆ 30 40	NOTES & COMMENTS	Depth (ft)
-	GRAVEL AND COBBLE (FILL) - some sand, trace of cl medium cobbles, dry, dense, grey - moist - diesel odour	ay, medium to coarse gravel,		36	8	0
-				75	•	-
-	PEAT (ORGANIC) - black, roots, diesel odour					
-						
-	SAND (TILL) - some silt, trace of clay, trace of fine to m grained, well graded, moist, loose, light brown, di	edium gravel, medium to coal esel odour	rse	200	000 •	_
_ 1	- free water					_
- - -				45	•	5
- - 2	END OF BOREHOLE (1.75 metres)		LOGGED BY: TH		COMPLETION DEPTH: 1.7	 7 - 75 m
E	2 00		REVIEWED BY: MB		COMPLETE: 12/08/06	
A TETRA	A TECH COMPANY		DRAWING NO: 141	U 122 3- 22	Page 1 of 1	

PHAS	E 3 ENVIRONMENTAL SITE ASSESSMENT	HOPE BAY MINING LI	MITED		PROJECT NO BOREHOL	E NO.
GENE	RATOR #2	DRILL: POWER AUG	ER		E14101223-AEC2-02	
HOPE	BAY					
SAMP	LE TYPE DISTURBED NO RECOV	ERY SPT	A-CASING		Y TUBE CORE	
BACK	FILL TYPE 🔲 BENTONITE 💢 PEA GRAVI	EL SLOUGH	GROUT	DRILL (CUTTINGS SAND	
Depth (m)	SOIL DESCRIPTION	V	SAMPLE TYPE	READING (ppm) ◆ 20 30 40	NOTES &	Depth (ft)
0	GRAVEL AND COBBLE (FILL) - trace of sand, trace of	clay, medium to coarse gravel	,			0
	medium cobbles, dry, dense, grey					
-						
-						
	- moist					
-						_
-						
						-
_						
-	PEAT (ORGANIC) - moist, black, roots SAND (TILL) - some silt, trace of clay, trace of fine to me	edium gravel, medium to coars	se 🕇			
-	grained, moist, loose, yellowish brown	g ,				
						_
-						
-						_
_ 1						
-						
-						_
-						
_			+ : : :			-
_	END OF BOREHOLE (1.50 metres)					5
	LIND OF BORLHOLE (1.30 Hielies)					
-						
-						
_						
-						
2		T	LOGGED BY: T	H	COMPLETION DEPTH: 1.	7 - 5 m
4	200		REVIEWED BY:		COMPLETE: 12/08/07	J 111
A TETRA	A TECH COMPANY		DRAWING NO:		Page 1 of 1	

PHASE	E 3 ENVIRONI	MENTAL SITE A	SSESSMENT	HOPE E	BAY MINING	LIMITE)			PROJ	IECT NO E	BOREHOLE	E NO.
GENE	RATOR #2			DRILL:	POWER AU	GER				E14101223-AEC2-03			
HOPE	BAY												
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-CASING		SHELB		CORE		
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L I	SLOUGH	0	GROUT		DRILL (CUTTING	S 👯 SAND		
Depth (m)		DE	SOIL SCRIPTION			L GAV	ш 🗀	D READING 20 3	G (ppm) ◆ 80 40		NOTES COMME		Depth (ft)
0	grey - moist, diesel SILT (ORGANIC few rock i	l odour C) - some sand, 5% nclusions, diesel odd	ce of medium to coal	ine granula	ar, wet, loose, bl	sional t, light				439 352 614 			5
2												7 -	
	<u> </u>					LOGO	SED BY:	TH		COI	MPLETION [DEPTH: 1.5	
2	POO!						EWED B				MPLETE: 12		
A TETRA	TECH COMPANY							: 141012	23-24		e 1 of 1		

PHAS	E 3 ENVIRONI	MENTAL SITE A	SSESSMENT	HOPE E	BAY MINING	LIMITED)					PR	ROJECTI	NO BOF	REHOLE	NO.
GENE	HASE 3 ENVIRONMENTAL SITE ASSESSMENT ENERATOR #2 OPE BAY				DRILL: POWER AUGER							E14101223-AEC2-04				
HOPE	BAY															
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-CA	SING			SHELB	Y TU	BE	CORE		
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L III	SLOUGH	0	GRO	JT			ORILL	CUTT	TINGS 👯	SAND		
Depth (m)	_	DE	SOIL SCRIPTION			I GWYO		◆PID 10	READ				NO	OTES &		Depth (ft)
0	- moist, diesel PEAT (ORGAN SAND (TILL) - s moist, loo SILT (ORGANIC - boulder END OF BORE	odour IC) - moist, loose, bloome fine to medium se, brownish yellow.	gravel, medium to co diesel odour lay, moist, loose, blaces	parse grain	ned, poorly grade		WC					918				5
2																7 -
						LOGG								TION DEF		8 m
E	900					REVIE				1222	25	-	COMPLE Page 1 of	TE: 12/08/	U/	
A TETRA	ATECH COMPANY					IUKAV	VIING	INU:	1410	1225-	20	115	-aue i oi	1		

PHAS	E 3 ENVIRONM	ENTAL SITE	ASSESSMENT	HOPE BAY MINI	NG LIMITE	D			F	PROJECT NO BOREHOLE	NO.
GENE	RATOR #2			DRILL: POWER	AUGER					E14101223-AEC2-05	
HOPE	BAY										
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY X SPT		A-CA	SING	SH	HELBY 1	TUBE CORE	
BACK	FILL TYPE	BENTONITE	PEA GRAVEI	L SLOUGH	. 0.	GRO	JT	☐ DF	RILL CU	TTINGS 🔅 SAND	
Depth (m)		DE	SOIL ESCRIPTION			SAMPLE TYPE	◆PID RE	ADING (ppr 0 30	m) ♦ 40	NOTES & COMMENTS	Depth (ft)
-	GRAVEL AND CC medium cot	DBBLE (FILL) - tr obles, damp, com	ace of clay and sand, r npact, slight diesel odo	medium to coarse gravur	vel, fine to	•					0
-	SILT (ORGANIC)	- fine gravel, san	dy, some clay, moist, le	oose, black, few roots							
-	SAND (TILL) - silt loose, brow	y, some fine to m	vel, fine to medium gra	ined, poorly graded, d	amp,	•					_
_ 1	END OF BOREH	DLE (1.20 metre	es)			•					-
- - - - -	Note: Stopped	due to auger refu	isal.				BY: TH			COMPLETION DEPTH: 1.2	5 - - m
Ē	2 bo						D BY: M			COMPLETE: 12/08/07	
A TETRA	A TECH COMPANY							101223-2	6 <u> </u>	Page 1 of 1	

PHASE	E 3 ENVIRONI	MENTAL SITE A	SSESSMENT	HOPE E	Bay Mining	LIMITED)				PF	ROJECT NO BORE	HOLE NO.
GENE	ENERATOR #2 [POWER AU	GER					E14101223-AEC2-06		
HOPE	BAY												
SAMPI	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-CAS	NG	П	SHEL	BY TL	JBE CORE	
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L M	SLOUGH	. 0 (GROU	Г		DRILL	CUT	TINGS SAND	
Depth (m)	_	DE	SOIL SCRIPTION			NAMPI HYDE		PID RI 10 2	EADING 20 3	G (ppm) 40		NOTES & COMMENTS	Depth (ft)
0	- moist SILT (ORGANIC SAND (TILL) - s brownish	c) - some sand, moi	st, black, rock inclusicel, fine to medium grains)	ons		ed,	•						5
, A	2					LOGG						COMPLETION DEPTH	
Ē	200					REVIE					(COMPLETE: 12/08/07	
A TETRA	TECH COMPANY					DRAW	/ING I	NO: 14	110122	23-27		Page 1 of 1	

GENERATOR #2 DRILL: POW					BAY MINING LIMITED PROJECT NO BOREH POWER ALIGER F14101223-AEC2						DLE NO.		
GENE	RATOR #2		DRILL:	POWER AU	GER					E14101223-AEC2-07			
HOPE	BAY												
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY X	SPT		A-CAS	SING		SHE	LBY T	TUBE CORE	
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L III	SLOUGH	. 0.	GROL	JT		DRIL	L CU	TTINGS SAND	
Depth (m)			SOIL SCRIPTION			ZAMDI H TYDE		◆PID 10	READI 20	NG (ppm) 30 40		NOTES & COMMENTS	Depth (ft)
	- moist - SILT (ORGANIC SAND (TILL) - s	C) - sandy, trace of fi	ce of clay, trace of sa 180 mm diameter, w ne to medium gravel ravel, medium to coa	, granular,	few roots		•						0
_ 1	END OF BORE	HOLE (1.00 metre)											_
2	A. BOILE	(1.00 mode)				LOGG	:FD	χ γ· T 1	H			COMPLETION DEPTH:	5
É	EDO A TECH COMPANY					REVIE	WEI	D BY:	MB	223-28		COMPLETE: 12/08/08 Page 1 of 1	1 111
A TETRA	A LECH COMPANY						VIIV	INU:	14 10 1	ZZJ-ZŎ		raue ioii	1

SAND (TILL) - sitty, trace of fine to medium ravel, trace of cobbles, wet, loose, non plastic, diesel odour END OF BOREHOLE (1.25 metres) 5_	PHASE	3 ENVIRON	MENTAL SITE A	HOPE E	BAY MINING I	LIMITED	P	PROJECT NO BOREHOLE NO.				
SAMPLE TYPE DISTURBED NO RECOVERY SPT ACASING SHELEY TUBE CORE ACKRILL TYPE BENTONTE PAGRAVEL SQUARY SQUAR	GENEF					POWER AUG	GER .			E14101223-AEC2-08		
SOIL DESCRIPTION GRAVEL AND COBBLE (FILL) - trace of sand, faces of city, medium to coarse gravel, medium to coarse catables to 250 mm dismeter, well graded day, desise, gray - PID READING (ppm) TO 20 30 40 NOTES & COMMENTS O GRAVEL AND COBBLE (FILL) - trace of sand, faces of city, medium to coarse gravel, medium to coarse catables to 250 mm dismeter, well graded day, desise, gray - Indist, dissal odour SILT (CREANING) - sandy, silty, trace of city, trace of medium gravel, most, soft, non plastic, black, dissal odour END OF BOREHOLE (1.25 metres) LOGGED BY: TH. COMPLETION DEPTH: 1.25 m. REVIEWED BY: MB. COMPLETION DEPTH: 1.20 m. REVIEWED BY: MB. COMPLETION DEPTH: 1.20 m. REVIEWED BY: MB. COMPLETION DEPTH: 1.20 m. REVIEWED BY: MB. COMPLETIC 1.20 m. Reviewed and the coarse gravel, making the coarse gravel, medium to c	HOPE I	BAY										
SOIL DESCRIPTION GRAVEL AND COBBLE (FELL) - trace of sand, trace of city, medium to coarse grave, medium to coarse cotobles to 250 mm diameter, well graded dry, dessea, grey FID READING, (ppm) 10 20 30 40 COMMENTS GRAVEL AND COBBLE (FELL) - trace of sand, trace of city, medium to coarse grave, medium to coarse cotobles to 250 mm diameter, well graded dry, dessea, grey FIN CREANING - sandy, siley, trace of city, trace of medium gravel, moist, soft, non plastic, black, diseal odour SAND (TILL) - siley, trace of fine to medium ravel, trace of cobbles, well, bose, non plastic, black diseal odour END OF BOREHOLE (1.25 metres) LOGGED BY:TH COMPLETION DEPTH: 1.25 m REVIEWED BY: MB COMPLETION DEPTH: 1.20 m REVIEWED BY: MB COM	SAMPL	E TYPE	DISTURBED	NO RECOVE	RY X	SPT	□ A	-CASING	∭ SH	IELBY T	UBE CORE	
SOIL DESCRIPTION GRAVEL AND COBBLE (PLL) - trace of sand, trace of day, medium to coarse gravel, medium to coarse cooldies to 250 mm diameter, well graded, chy, dente, grey - PRD REJOING (porn) + (10 medium to coarse cooldies to 250 mm diameter, well graded, chy, dente, grey - Mile (PROSE)			BENTONITE	PEA GRAVE	L M	SLOUGH	- C	ROUT	DR	RILL CUT	TTINGS SAND	
- moist, diesel odour SILT (CRGANIC) - sandy, silty, trace of day, trace of medium gravel, moist, soft, non plastic, black, diesel odour SAND (TILL) - silty, trace of fine to medium ravel, trace of cobbles, wet, loose, non plastic, dead odour END OF BOREHOLE (1.25 metres) LOGGED BY: TH COMPLETION DEPTH: 1.25 m REVIEWED BY: MB COMPLETE: 1208/08			DE	SOIL SCRIPTION			SAMPLE TYPE				NOTES &	Depth (ft)
SILT (CRGANIC) - sandy, silty, trace of clay, trace of medium gravel, moist, soft, non plastic, black, diesel odour SAND (TILL) - silty, trace of fine to medium ravel, trace of cobbles, wet, loose, non plastic, diesel odour END OF BOREHOLE (1.25 metres) 5_ LOGGED BY: TH REVIEWED BY: MB COMPLETION DEPTH: 1.25 m	0	GRAVEL AND to medium to	COBBLE (FILL) - tra	ce of sand, trace of c 250 mm diameter, we	lay, mediu ell graded,	m to coarse grav dry, dense, grey	el,		•			-
SAND (TILL) -sity, trace of fine to medium ravel, trace of cobbles, wet, loose, non plastic, diesel odour END OF BOREHOLE (1.25 metres) LOGGED BY: TH COMPLETION DEPTH: 1.25 m REVIEWED BY: MB COMPLETE: 12/08/08	-	- moist, diesel	odour							88		_
END OF BOREHOLE (1.25 metres) END OF BOREHOLE (1.25 metres) LOGGED BY: TH REVIEWED BY: MB COMPLETE: 12/08/08	- - _ 1	SILT (ORGANIC) - sandy, silty, trace of clay, trace of m plastic, black, diesel odour				fium gravel, moist, soft, non						-
LOGGED BY: TH REVIEWED BY: MB COMPLETE: 12/08/08	-			nedium ravel, trace o	f cobbles,	wet, loose, non	1			217		_
REVIEWED BY: MB COMPLETE: 12/08/08	- 2	END OF BORE	HOLE (1.25 metres	8)								7 -
												25 m
	A TETRA T	TECH COMPANY										

PHASE 3 ENVIRONMENTAL SITE ASSESSMENT	HOPE BAY MINING LIN	MITED	PROJEC	PROJECT NO BOREHOLE NO.				
AEC3	DRILL: HAND AUGER		E	E14101223-AEC3-01				
HOPE BAY								
SAMPLE TYPE DISTURBED NO RECOVE	RY X SPT		SHELBY TUBE	CORE				
BACKFILL TYPE BENTONITE PEA GRAVE	L SLOUGH	GROUT	DRILL CUTTINGS	SAND				
SOIL DESCRIPTION		◆PID READING (10 20 30		NOTES & COMMENTS	Depth (ft)			
SILT (ORGANIC) - silty, sandy, trace of clay, fine to medi moist, soft, black, roots, (30 mm thick) SAND (TILL) - some silt, trace of fine to medium gravel, t grained, moist, loose, yellowish brown - 200 mm thick silt (organic) layer - silty, sandy, trace of sand, well graded, moist, soft, black, roots, (30 mm sand, well graded, moist, soft, black, roots, (30 mm sand, well graded and sand, well graded s	race of clay, fine to medium grained thick)				5			
		LOGGED BY: TH		PLETION DEPTH: 1.1	m			
A TETRA TECH COMPANY		REVIEWED BY: MB DRAWING NO: 14101223	EVIEWED BY: MB					

PHAS	HASE 3 ENVIRONMENTAL SITE ASSESSMENT				HOPE BAY MINING LIMITED							PROJECT NO BOREHOLE NO.		
AEC3				DRILL: H	HAND AUGER	2							E14101223-AEC3-02	
HOPE	BAY													
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-C	ASING			SHEL	BY T	UBE CORE	
BACK	FILL TYPE	BENTONITE	PEA GRAVE	- 📗	SLOUGH	٥٠	GRO	DUT			DRILL	_ CUT	TTINGS 💢 SAND	
Depth (m)		DE	SOIL ESCRIPTION				SAIMPLE IYPE	◆PID 10	REA 20	DING (ppm) ∢ 40	•	NOTES & COMMENTS	Depth (ft)
0	SILT (ORGANIC	C) - silty, sandy, trac	ce of clay, fine to medi	ım grained	sand, well graded	l,					: :	:		0
-	SAND (TILL) - s	t, black, roots, (50 r iilty, trace of clay, tr st, loose, yellowish	mm thick) ace of fine to medium brown, (200 mm thick	gravel, fine	to medium graine	d	•							-
_	011 = (00 0 1 1 1 1	N												
-	\ moist, sof SAND (TILL) - s	t, black, roots, (40 r	ace of medium to coar			l, /	•							_
-						- 1								
-														
-	END OF DODE	1015 (0.00 mater												
	Note: Stoppe	HOLE (0.60 metre d due to auger refu	ss) sal.											
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2					Т	100		D) / =				:	OOMBI ETION DETERMINE	7 -
								BY: T ED BY					COMPLETION DEPTH: 0.6 COMPLETE: 12/08/09	m
A TETRA	TECH COMPANY							G NO.			R_31		Page 1 of 1	

PHASE 3 ENVIRONMENTAL SITE ASSESSMENT				HOPE BAY MINING	LIMITED		PROJECT NO BOREHOLE NO.				
AEC3				DRILL: HAND AUG	ER			E14101223-AEC3-03			
HOPE	BAY										
SAMP	LE TYPE	DISTURBED	NO RECOVE			CASING		BY TUBE CORE			
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	G G	ROUT	DRILL	CUTTINGS SAND			
Depth (m)		DE	SOIL ESCRIPTION		SAMPLE TYPE	◆PID 10	READING (ppm) ◆ 20 30 40	NOTES & COMMENTS	Depth (ft)		
-	SILT (ORGANIC) brown, roo	- silty, sandy, trac ts, (170 mm thick)	ce of clay, fine grained	sand, well graded, moist,	soft,				0		
-	SAND (TILL) - so grained, m	ome silt, trace of cl oist, loose, grey b	ay, trace of fine to med rown	dium gravel, fine to mediu	m				_		
-	END OF DODE!	OLE (0.50 metre							_		
-	Note: Stopped	due to auger refu	isal.						_		
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É	2				REVIEV	D BY: TI VED BY:	MB	COMPLETION DEPTH: 0.5 m COMPLETE: 12/08/09			
A TETRA	TECH COMPANY					NG NO:	14101223-32	Page 1 of 1			

PHAS	E 3 ENVIRONMENTAL SITE ASSESSMENT	HOPE BAY MINING LI	MITED	PROJECT NO BOREHOLE NO.				
AEC3		DRILL: HAND AUGEF	}		E14101223-AEC3-04			
HOPE	BAY							
SAMP	LE TYPE DISTURBED NO RECOVI	RY SPT	A-CASING	G SHELI	BY TUBE CORE			
BACK	FILL TYPE 📗 BENTONITE 📝 PEA GRAVE	L SLOUGH	GROUT	DRILL	CUTTINGS SAND			
Depth (m)	SOIL DESCRIPTION	I	SAMPLE TYPE	PID READING (ppm) ◀ 20 30 40	NOTES & COMMENTS	Depth (ft)		
0	SILT (ORGANIC) - silty, sandy, trace of clay, fine to med	ium grained sand, well graded	l,		:	0		
}	moist, soft, black, roots, (70 mm thick) SAND (TILL) - silty, trace of clay, fine to medium grained	. poorly graded, moist, loose.						
-	SAND (TILL) - silty, trace of clay, fine to medium grained yellowish brown SILT (TILL) - some fine to medium grained sand, some firm, low plastic, grey					-		
_ 1								
-	SAND (TILL) - silty, trace of clay, trace of medium grave wet, loose, yellowish brown END OF BOREHOLE (1.25 metres)	, fine to medium grained sand	•			-		
-	Note: Stopped due to auger refusal.							
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<u> </u>	<u></u>		LOGGED BY:		COMPLETION DEPTH:	.25 m		
Ē	2 00		REVIEWED E		COMPLETE: 12/08/09			
A TETRA	ATECH COMPANY		DRAWING NO	D: 14101223-33				

PHAS	HASE 3 ENVIRONMENTAL SITE ASSESSMENT				HOPE BAY MINING LIMITED							PROJECT NO BOREHOLE NO.		
AEC3			DRILL: HAND AUGER							E14101223-AEC3-05				
HOPE	BAY													
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-C	ASING		SHE	LBY T	UBE CORE		
BACK	FILL TYPE	BENTONITE	PEA GRAVE		SLOUGH	. 0.	GR	OUT		DRIL	L CUT	TINGS SAND		
Depth (m)		DI	SOIL ESCRIPTION				SAMPLE TYPE	◆PID I 10	READIN 20	G (ppm) 30 40	♦	NOTES & COMMENTS	Depth (ft)	
0	SILT (ORGANIC	C) - silty, sandy, tra	ce of clay, fine to medi	um grained	d, moist, soft, bla	ck,					:		0	
-	SAND (TILL) - s	mm thick) silty, trace of clay, to se, yellowish brow	race of fine to medium	gravel, fine	to medium grai	ned,								
		00, your	•										-	
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-	- moist to wet										:			
	- moist to wet													
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_ 1	SILT (TILL) - so	me fine to medium	grained sand, some c	lay, trace o	f fine gravel, we	t,								
-	firm, low p	plastic, grey											-	
-	END OF BORE	HOLE (1.20 metre	es)										_	
-	поте. Эторре	u due to auger reit	isai.											
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A TETRA	EDQ A TETRA TECH COMPANY			REVIEWED BY: MB DRAWING NO: 14101223-34								COMPLETE: 12/08/09 Page 1 of 1		

PHASE 3 ENVIRONMENTAL SITE ASSESSMENT				HOPE BAY MINING LIMITED					PROJECT NO BOREHOLE NO.		
INCIN	ERATOR			DRILL: POWER AUG	ER			E14101223-AEC6-01			
HOPE	BAY										
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY SPT	A	-CASING	SHEL	BY TUBE	CORE		
BACKI	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	[6 C	ROUT	DRILL	CUTTINGS	S SAND		
Depth (m)		DI	SOIL ESCRIPTION	I	SAMPLE TYPE	◆PID I	READING (ppm) • 20 30 40	•	NOTES & COMMENTS	Depth (ft)	
	medium g thick)	rained sand, fine t	o coarse, well graded,	m diameter, trace to fine to damp, compact, grey, (200 m black, many roots, (230 mm	nm ,	•				0	
-	thick)					•				_	
_	plastic, ye	llowish brown, iror	oxide mottling	ace of cobbles, damp, soft, lov	W					_	
	Note: Stoppe	HOLE (0.50 metro d due to auger refu	es) Isal.								
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						ED BY: TH			IPLETION DEPTH: 0.5	i m	
A TETRA	TECH COMPANY			-		WED BY:	<u>MB</u> 14101223-35		IPLETE: 12/08/08		

				HOPE BAY MINING LIMITED						PROJECT NO BOREHOLE NO.		
INCINI	ICINERATOR ODE DAY				POWER AU	GER				E14101223-AEC6-02		
HOPE	BAY											
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-CASIN	G	SHE	LBY TI	JBE CORE	
	FILL TYPE	BENTONITE	PEA GRAVE		SLOUGH	0 (GROUT		DRIL	L CUT	TINGS SAND	
Depth (m)			SOIL SCRIPTION			SAMPI F TYPE	1	PID READ) 20	ING (ppm) 30 40		NOTES & COMMENTS	Depth (ft)
-	GRAVEL (FILL) coarse, w - damp) - some medium an vell graded, dry, den:	d coarse cobbles to 3 se, grey	00 mm dia	meter, medium t	0	•					0
-			np, soft, black, many r n to coarse gravel, tra sh brown, iron oxides		fine to coarse	-	•					_
-							•					-
_ 1	- 10-20 mm th	nick organic layer - b	lack, iron oxide inclus	ions aroun	d layer	ı	•					-
- - - - - -	END OF BORE Note: Stoppe	HOLE (1.15 metre: d due to auger refus	s) Pal.									5
				LOGGED BY: TH REVIEWED BY: MB							COMPLETION DEPTH: COMPLETE: 12/08/08	1.15 M
A TETRA	EDO TETRA TECH COMPANY								1223-36		Page 1 of 1	

PHASE	E 3 ENVIRONI	HOPE BAY MINING LIMITED						PROJECT NO BOREHOLE NO.					
INCINE	NCINERATOR				POWER AL	JGER				E14101223-AEC6-03			
HOPE	BAY												
SAMPI	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-CASING	П	SHELBY	′ TUBE	CORE		
	FILL TYPE	BENTONITE	PEA GRAVE		SLOUGH	.0.	GROUT		DRILL C	UTTINGS	SAND		
Depth (m)			SOIL SCRIPTION				⊔ L -	READING (20 30			NOTES &		Depth (ft)
	subanguli dry, grey - damp	ar gravel, medium to	ce of sand, trace of cloorse cobbles to 23	30 mm diai	n to coarse neter, well grad	ded,	•						
- - - _ 1					obbles to 90 m ose, yellowish l	n prown,							-
2	END OF BOREL Note: Stoppe	HOLE (1.20 metres	s) al.										5
						SED BY: T EWED BY				PLETION DEF PLETF: 12/08/		m	
A TETRA	TETRA TECH COMPANY							14101223	3-37	COMPLETE: 12/08/08 Page 1 of 1			

PHASE 3 ENVIRONMENTAL SITE ASSESSMENT										PROJECT NO BOREHOLE NO.			
INCINE	CINERATOR				POWER AUG	GER					E14101223-AEC6-04		
HOPE	BAY												
SAMPI	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-CAS	ING		SHEL	3Y TUI	BE CORE	
BACKE	FILL TYPE	BENTONITE	PEA GRAVE	L III	SLOUGH	. 0.	GROU	Т		DRILL	CUTT	INGS SAND	
Depth (m)	_		SOIL SCRIPTION			OAMDI E TVDE		PID RE	EADING 0 30			NOTES & COMMENTS	Depth (ft)
	of sand, d	lry, dense, grey	ium cobbles to 140 m	m diamete	r, trace of clay, tr	ace							
- - - -	fine to me	avelly, some sand, tedium, moist, soft, lo		al cobble t	to 110 mm diame	eter,							-
- 2	Note: Stoppe	HOLE (1.00 metre, d due to auger refus	sal.										5
A TETRA	TECH COMPANY			LOGGED BY: TH REVIEWED BY: MB DRAWING NO: 14101223-3					3-38	COMPLETION DEPTH: 1 m COMPLETE: 12/08/08 Page 1 of 1			

PHASE 3 ENVIRONMENTAL SITE ASSESSMENT	HOPE BAY MINING LIN	/IITED	PROJECT NO BOREHOLE NO.			
APEC1	DRILL: HAND AUGER				E14101223-APEC1-01	
HOPE BAY						
SAMPLE TYPE DISTURBED NO RECOVE	RY SPT	A-	CASING	SHELE	BY TUBE CORE	
BACKFILL TYPE BENTONITE PEA GRAVEI	. SLOUGH	o GI	ROUT	DRILL	CUTTINGS SAND	
SOIL DESCRIPTION		SAMPLE TYPE	◆PIDR 10	EADING (ppm) ◆ 20 30 40	NOTES &	Depth (ft)
0 SILT (ORGANIC) - silty, sandy, some clay, trace of fine gr sand, well graded, moist, soft, black, roots, (60 mm	avel, fine to medium grained				:	0
moist, loose, dark brown, silt (organic) inclusions, re	oots					-
- 1 - 1 -						-
- - - - - - - 2	Ιι	OGGE	D BY: TH		COMPLETION DEPTH: 0.5	5_ - - 56 m
A TETRA TECH COMPANY	F	REVIEV	VED BY: N		COMPLETE: 12/08/09 Page 1 of 1	

PHASE 3 ENVIRONMENTAL SITE ASSESSMENT	HOPE BAY MINING L	IMITED	F	PROJECT NO BOREHOLE NO.		
APEC1	DRILL: HAND AUGER	₹		E14101223-APEC1-02		
HOPE BAY						
SAMPLE TYPE DISTURBED NO RECOVE	RY SPT	A-CASING	SHELBY 1	TUBE CORE		
BACKFILL TYPE BENTONITE PEA GRAVE	L SLOUGH	GROUT	DRILL CU	TTINGS SAND		
SOIL DESCRIPTION		SAMPLE TYPE	0 READING (ppm) ◆ 20 30 40	NOTES & COMMENTS	Depth (ft)	
SILT (ORGANIC) - sitty, sandy, some clay, trace of media medium grained sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the sand, well graded, moist, soft, blate in the site of sand, well graded, moist, soft, blate in the sand, well graded, we	um to coarse gravel, fine to ck, roots				5	
		LOGGED BY: T		COMPLETION DEPTH: 0.4	5 m	
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A TETRA TECH COMPANY		DRAWING NO:	14101773-40	Page 1 of 1		

PHAS	E 3 ENVIRON	MENTAL SITE	ASSESSMENT	HOPE B	AY MINING L	IMITED					PROJE	ECT NO BC	REHOLE	NO.
APEC	:1			DRILL:	HAND AUGE	R					Е	- 14101223-AI	PEC1-03	
HOPE	BAY													
SAMP	PLE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT	A	-CASIN	IG		HELBY		CORE		
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L 🏢	SLOUGH	[0 C	ROUT			RILL C	UTTING	S SAND		
Depth (m)			SOIL ESCRIPTION			SAMPLE TYPE		PID RE/ 0 20	ADING (pp) 30	om) ◆ 40		NOTES COMMEN		Depth (ft)
-	graded, i SAND (TILL) -	moist, soft, black, ro	ay, fine to medium gra				•							0
_	END OF BORE	HOLE (0.52 metre	es)											
-	Note: Stoppe	ed due to auger refu	sal.											
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A TETRA	EOO A TECH COMPANY								3 101223-4	41		1PLETE: 12/0 e1 of 1	0/09	

PHAS	E 3 ENVIRON	MENTAL SITE	ASSESSMENT	HOPE BAY MINING L	MITED			PRO	IECT NO BOREHOLE	E NO.
APEC	1			DRILL: HAND AUGER	₹				E14101223-APEC1-04	
HOPE	BAY									
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY SPT		-CASING	SHEL	BY TUBE	CORE	
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	6 C	ROUT	DRILL	CUTTING	S SAND	
Depth (m)		DI	SOIL ESCRIPTION		SAMPLE TYPE	◆PID I 10	READING (ppm) • 20 30 40	•	NOTES & COMMENTS	Depth (ft)
0	SILT (ORGANIC	c) - silty, sandy, soi	me clay, fine to mediur	n grained sand, well graded,						0
_	SAND (TILL) - s	i, black, roots, (70 i ilty, trace of clay, tr	ace of fine to medium	gravel, medium to coarse	-					
	grained, n	noist, loose, yellow	ish brown, roots			†				
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_	END OF BORE! Note: Stoppe	HOLE (1.15 metre d due to auger refu	es) Isal.							
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A TETRA	A TECH COMPANY						14101223-42	Pac	e 1 of 1	

PHAS	E 3 ENVIRONMENTAL SITE ASSESSMENT	HOPE BAY MINING L	IMITED			PROJI	ECT NO BOREHOLE	ENO.
APEC	1	DRILL: HAND AUGE	7			E	E14101223-APEC1-05	
HOPE	BAY							
SAMP	LE TYPE DISTURBED NO RECOV	ERY X SPT		CASING	SHELE	BY TUBE	CORE	
BACK	FILL TYPE BENTONITE PEA GRAV	EL SLOUGH	GF	ROUT	DRILL	CUTTINGS	S SAND	
Depth (m)	SOIL DESCRIPTIOI	N	SAMPLE TYPE	◆PID RE	EADING (ppm) ◆ 0 30 40	· (NOTES & COMMENTS	Depth (ft)
0	SILT (ORGANIC) - silty, sandy, trace of clay, fine to med	lium grained sand, well grade	d,					0
	moist, soft, black, roots, (50 mm thick) SAND (TILL) - silty, trace of clay, trace of fine to mediur	gravel, medium to coarse	_/					
-	grained, moist, loose, yellowish brown			• i i i i i i i i i i i i i i i i i i i				_
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-	END OF BOREHOLE (1.00 metres) Note: Stopped due to auger refusal.							-
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Ê	200		REVIEV	VED BY: M		COM	1PLETE: 12/08/09	
A TETRA	ATECH COMPANY		DRAWII	NG NO: 14	101223-43	Page	e 1 of 1	

PHASI	E 3 ENVIRON	MENTAL SITE	ASSESSMENT	HOPE B	AY MINING LI	MITED)					PF	ROJECT NO BOREHOLE	E NO.
APEC ²	1			DRILL:	HAND AUGER								E14101223-APEC1-06	
HOPE	BAY													
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-C	ASING			SHELI	BY TL	JBE CORE	
BACKI	FILL TYPE	BENTONITE	PEA GRAVE	- 🔲	SLOUGH	0	GRO	DUT			DRILL	CUT	TINGS 👯 SAND	
Depth (m)		DE	SOIL ESCRIPTION			CAMDI E TVDE	SAIMPLE LIPE	◆PID 10	REAI 20	DING (I	ppm) ◆ 40	•	NOTES & COMMENTS	Depth (ft)
0	SILT (ORGANIC	c) - silty, sandy, trac t, black, roots, (60 r	ce of clay, fine to medi	ım grained	sand, well graded	,								0
ŀ	SAND (TILL) - s	ilty, trace of clay, tr	ace of fine to medium	gravel, fine	to coarse grained				: :	: :		:		
-	moist, loo	se, yellowish brown	1	g. a. r. o.,o	to course grames		•							
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_	END OF BORE	HOLE (0.50 metre	es)											
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A TETRA	TECH COMPANY							ED BY:		11223	_11		COMPLETE: 12/08/09 Page 1 of 1	

PHASE	E 3 ENVIRONI	MENTAL SITE	ASSESSMENT	HOPE BAY MINING LI	MITED			PROJE	CT NO BOREHOLE	ENO.
APEC	5			DRILL: HAND AUGER	}			Е	14101223-APEC5-01	
HOPE	BAY									
SAMPI	LE TYPE	DISTURBED	NO RECOVE	RY SPT	A-	CASING	SHEL	BY TUBE	CORE	
BACK	FILL TYPE	BENTONITE	PEA GRAVE	L SLOUGH	o G	ROUT	DRIL	CUTTINGS	SAND	
Depth (m)		DI	SOIL ESCRIPTION		SAMPLE TYPE	◆PID 10	READING (ppm) 4		NOTES & COMMENTS	Depth (ft)
0				um grained sand, moist, soft,						0
-	END OF BORE	HOLE (0.58 metr	es)	gravel, medium to coarse ble odour	•					-
-	Note: Stoppe	d due to auger refu	ısal.							-
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2										7 -
	bo				REVIEV	D BY: TI		COM	PLETION DEPTH: 0.5 PLETE: 12/08/09 1 of 1	

PHASE	E 3 ENVIRONI	MENTAL SITE A	SSESSMENT	HOPE I	BAY MINING	G LIMITE	D				PR	OJECT NO BOREHOL	E NO.
APEC:	5			DRILL:	HAND AUG	GER						E14101223-APEC5-02	2
HOPE	BAY												
SAMPI	LE TYPE	DISTURBED	NO RECOVE	RY X	SPT		A-C	ASING	П	SHEL	BY TUE	BE CORE	
	FILL TYPE	BENTONITE	PEA GRAVE	L M	SLOUGH	. 0.	GR	OUT		DRIL	L CUTTI	INGS SAND	
Depth (m)		DE	SOIL SCRIPTION				SAMPLE TYPE		READIN 20	G (ppm) · 30 40		NOTES & COMMENTS	Depth (ft)
0	PEAT (ORGAN	IC) - mesic, wet, bla	ck, (80 mm thick)										0
1	medium p - free water - grey brown END OF BORE	ayey, trace of fine gr lastic, yellowish bro HOLE (0.75 metres d due to auger refus	3)	ine to med	ium gravel, we	et, firm,							5_
-													7 -
_ ∠	<u> </u>					LOG	GFI	BY: TI	 -			OMPLETION DEPTH: 0.	
								ED BY:				OMPLETE: 12/08/09	. •
A TETRA	TECH COMPANY							G NO:		223-46	P	age 1 of 1	

PHAS	E 3 ENVIRONI	MENTAL SITE	ASSESSMENT	HOPE E	BAY MINING LI	MITE	D					PF	ROJECT NO BOREHOLE	E NO.
APEC	5			DRILL:	HAND AUGEF	₹							E14101223-APEC5-03	
HOPE	BAY													
SAMP	LE TYPE	DISTURBED	NO RECOVE	RY 🔀	SPT		A-C	ASING			SHELE	BY TU	BE CORE	
BACK	FILL TYPE	BENTONITE	PEA GRAVE	- 1	SLOUGH	.0.	GR	OUT			DRILL	CUTT	TINGS SAND	
Depth (m)		DE	SOIL ESCRIPTION			Ļ	SAMPLE IYPE	◆PID 10	REAI 20		ppm) ◆ 40		NOTES & COMMENTS	Depth (ft)
0	SILT (ORGANIC	C) - silty, sandy, tra	ce of clay, fine to media	ım grained	sand, moist, soft,							:		0
	SILT (TILL) - cla	ts, (50 mm thick)	rained sand, trace of fi	ne gravel,	moist, firm, mediu	m / [: :		:		
-	plastic, ye	ellowish brown, roo	ts	3 ,	, , , , , , , , , , , , , , , , , , , ,		•							
-										: :		:		
-							•					:		
														_
-									: :		ļ			
-	END OF BORE	HOLE (0.55 metre	es)			_								
-	Note: Stoppe	d due to auger refu	isal.											_
												:		
-														
														-
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-														
2														7 -
								BY: T					COMPLETION DEPTH: 0.5	
Ē	bo					REVI	ΕW	ED BY	: MB			(COMPLETE: 12/08/09	
A TETRA	TECH COMPANY					DRAI.	Λ/IN	G NO:	1410	11773	_47	16	Page 1 of 1	

APPENDIX B LABORATORY ANALYTICAL RESULTS





Your Project #: E14101223 Site Location: HOPE BAY, NT

Your C.O.C. #: A154884, A154885, A154886, A154887,

A154888

Attention: MICHEL HEBERT

EBA ENGINEERING CONSULTANTS LTD. 14940-123 AVENUE EDMONTON, AB CANADA T5V 1B4

Report Date: 2012/09/06

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B272000 Received: 2012/08/13, 16:00

Sample Matrix: Soil # Samples Received: 48

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS (MeOH extract)	36	2012/08/16	2012/08/23	AB SOP-00039	CCME, EPA 8260C
BTEX/F1 by HS GC/MS (MeOH extract)	2	2012/08/16	2012/08/24	AB SOP-00039	CCME, EPA 8260C
CCME Hydrocarbons (F2-F4 in soil)	9	2012/08/16	2012/08/21	AB SOP-00040	CCME PHC-CWS
				AB SOP-00036	
CCME Hydrocarbons (F2-F4 in soil)	12	2012/08/16	2012/08/22	AB SOP-00040	CCME PHC-CWS
				AB SOP-00036	
CCME Hydrocarbons (F2-F4 in soil)	17	2012/08/16	2012/08/23	AB SOP-00040	CCME PHC-CWS
				AB SOP-00036	
Moisture	48	N/A	2012/08/17	AB SOP-00002	CCME PHC-CWS
Particle Size by Sieve (75 micron)	5	N/A	2012/08/30	AB SOP-00022	SSMA 55.4

Sample Matrix: Water # Samples Received: 12

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	9	N/A	2012/08/16	AB SOP-00005	SM 2320-B
BTEX/F1 in Water by HS GC/MS	12	N/A	2012/08/18	AB SOP-00039	CCME, EPA 8260C
Chloride by Automated Colourimetry	9	N/A	2012/08/18	AB SOP-00020	EPA 325.2
Conductivity @25C	9	N/A	2012/08/16	AB SOP-00005	SM 2510-B
CCME Hydrocarbons in Water (F2; C10-C16)	1	2012/08/16	2012/08/20	AB SOP-00040	EPA3510C/CCME PHCCWS
				AB SOP-00037	
CCME Hydrocarbons in Water (F2; C10-C16)	11	2012/08/16	2012/08/21	AB SOP-00040	EPA3510C/CCME PHCCWS
				AB SOP-00037	
Hardness	8	N/A	2012/08/21	AB WI-00065	SM 2340B
Elements by ICP - Dissolved	8	N/A	2012/08/21	AB SOP-00042	EPA 200.7
Ion Balance	8	N/A	2012/08/17	AB WI-00065	SM 1030E
Sum of cations, anions	8	N/A	2012/08/21	AB WI-00065	SM 1030E
Nitrate and Nitrite	9	N/A	2012/08/21	AB SOP-00023	SM4110B
Nitrate + Nitrite-N (calculated)	9	N/A	2012/08/21	AB SOP-00023	SM 4110-B
Nitrogen, (Nitrite, Nitrate) by IC	2	N/A	2012/08/20	AB SOP-00023	SM 4110-B
Nitrogen, (Nitrite, Nitrate) by IC	7	N/A	2012/08/21	AB SOP-00023	SM 4110-B
pH @25°C (Alkalinity titrator)	9	N/A	2012/08/16	AB SOP-00005	SM 4500-H+B
Sulphate by Automated Colourimetry	9	N/A	2012/08/18	AB SOP-00018	EPA 375.4
Total Dissolved Solids (Calculated)	8	N/A	2012/08/21	AB WI-00065	SM 1030E



Your Project #: E14101223 Site Location: HOPE BAY, NT

Your C.O.C. #: A154884, A154885, A154886, A154887,

A154888

Attention: MICHEL HEBERT EBA ENGINEERING CONSULTANTS LTD. 14940-123 AVENUE EDMONTON, AB CANADA T5V 1B4

Report Date: 2012/09/06

CERTIFICATE OF ANALYSIS -2-

Encryption Key

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

Anna Gordon, Project Manager Email: AGordon@maxxam.ca Phone# (403) 291-3077

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Maxxam Job #: B272000 Report Date: 2012/09/06

EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		EE8483	EE8484	EE8485	EE8486		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		13:50	13:45	14:00	14:00		
COC Number		A154884	A154884	A154884	A154884		
	UNITS	AEC1-2	AEC1-3	AEC1-4	AEC1-5	RDL	QC Batch
		@ 0.25-0.5M	@ 0.25-0.5M	@ 0.25-0.5M	@ 0.25-0.5M		
		© 0.20 0.0M	@ 0.20 0.0W	© 0120 010111	© 0.20 0.0M		
		© 0.20 0.0M	© 0.20 0.0m	© 0120 010111	© 0.20 0.0W	_	
Physical Properties		© 0.20 0.0M	6 0.20 0.5m	0.0120 0.0111	© 0.25 0.5M		
Physical Properties Moisture	%	11	9.1	14	10	0.30	6090864

Maxxam ID		EE8487	EE8488	EE8489	EE8490		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		14:10	14:10	14:20	14:20		
COC Number		A154884	A154884	A154884	A154884		
	UNITS	AEC1-6	AEC1-7	AEC1-11	AEC1-12	RDL	QC Batch
	1 1	@ 0.2-0.4M	@ 0.2-0.4M	@ 0.25-0.5M	@ 0.25-0.5M		
Physical Properties							

	EE8491	EE8492	EE8493	EE8494		
	2012/08/11	2012/08/11	2012/08/11	2012/08/11		
	13:40	08:30	08:35	08:40		
	A154884	A154884	A154884	A154884		
UNITS	AEC1-3	AEC2-1	AEC2-1	AEC2-2	RDL	QC Batch
	@ 0.5-0.75M	@ 0.75-1M	@ 1.5-1.75M	@ 0.75-1M		
%	8.8	17	11	10	0.30	6090864
%	36	N/A	N/A	N/A	0.20	6116609
%	64	N/A	N/A	N/A	0.20	6116609
%	COARSE	N/A	N/A	N/A	0.20	6116609
	% %	2012/08/11 13:40 A154884 UNITS AEC1-3 @ 0.5-0.75M % 8.8 % 36 % 64	2012/08/11 2012/08/11 13:40 08:30 A154884 A154884 A154884 UNITS AEC1-3 AEC2-1 @ 0.75-1M % 8.8 17 % 36 N/A % 64 N/A	2012/08/11 2012/08/11 2012/08/11 13:40 08:30 08:35	2012/08/11 2012/08/11 2012/08/11 2012/08/11 13:40 08:30 08:35 08:40	2012/08/11 2012/08/11 2012/08/11 08:30 08:35 08:40 A154884

N/A = Not Applicable RDL = Reportable Detection Limit



Maxxam Job #: B272000 Report Date: 2012/09/06

EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

RESULTS OF CHEMICAL ANALYSES OF SOIL

2012/08/11	2012/08/11	2012/08/11	0010100111		
		2012/00/11	2012/08/11		
08:50	09:00	09:10	09:20		
A154885	A154885	A154885	A154885		
S AEC2-3	AEC2-4	AEC2-5	AEC2-6	RDL	QC Batch
@ 1.25-1.5	@ 0.5-0.7M	@ 0.75-1M	@ 0.75-1M		
15	3.8	8.9	11	0.30	6090864
N/A	N/A	N/A	39	0.20	6116609
N/A	N/A	N/A	61	0.20	6116609
N/A	N/A	N/A	COARSE	0.20	6116609
	A154885 FS AEC2-3 @ 1.25-1.5 15 N/A N/A	A154885 A154885 FS AEC2-3 AEC2-4 @ 1.25-1.5 @ 0.5-0.7M 15 3.8 N/A N/A N/A N/A N/A	A154885 A154885 A154885 AEC2-3 AEC2-4 AEC2-5 @ 1.25-1.5 @ 0.5-0.7M @ 0.75-1M 15 3.8 8.9 N/A N/A N/A N/A N/A N/A N/A	A154885 A154885 A154885 A154885 AEC2-3 AEC2-4 AEC2-5 AEC2-6 @ 1.25-1.5 @ 0.5-0.7M @ 0.75-1M @ 0.75-1M 15 3.8 8.9 11 N/A N/A N/A N/A 39 N/A N/A N/A N/A 61	A154885 A154885 A154885 A154885 A154885 AEC2-3 AEC2-4 AEC2-5 AEC2-6 RDL @ 1.25-1.5 @ 0.5-0.7M @ 0.75-1M @ 0.75-1M 15 3.8 8.9 11 0.30 N/A N/A N/A N/A 39 0.20 N/A N/A N/A N/A 61 0.20

Maxxam ID		EE8516	EE8517	EE8518		EE8519		
Sampling Date		2012/08/11	2012/08/11	2012/08/11		2012/08/11		
		09:30	09:40	12:10		12:20		
COC Number		A154885	A154885	A154885		A154885		
	UNITS	AEC2-7	AEC2-8	AEC3-1	QC Batch	AEC3-2	RDL	QC Batch
		@ 0.75-1M	@ 0.75-1M	@ 0.75-1M		@ 0.25-0.5M		

Physical Properties								
Moisture	%	11	18	12	6090864	19	0.30	6090874

RDL = Reportable Detection Limit

Maxxam ID		EE8520	EE8521	EE8522	EE8523		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		12:30	12:40	12:50	09:50		
COC Number		A154885	A154885	A154885	A154885		
	UNITS	AEC3-3	AEC3-4	AEC3-5	AEC6-1	RDL	QC Batch
		@ 0.25-0.5M	@ 0.75-1M	@ 0.75-1M	@ 0.25-0.5		
Physical Properties							
Moisture	%	14	9.0	10	21	0.30	6090874
Sieve - Pan	%	25	N/A	N/A	N/A	0.20	6116609
Sieve - #200 (>0.075mm)	%	75	N/A	N/A	N/A	0.20	6116609
Grain Size	%	COARSE	Ν/Δ	N/A	N/A		6116609

N/A = Not Applicable RDL = Reportable Detection Limit



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		EE8524	EE8573	EE8574	EE8575		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		10:00	10:10	10:20	11:00		
COC Number		A154886	A154886	A154886	A154886		
	UNITS	AEC6-2	AEC6-3	AEC6-4	APEC1-1	RDL	QC Batch
		@ 0.75-1M	@ 0.75-1M	@ 0.75-1M	@ 0.25-0.5M		
Physical Properties							
Physical Properties Moisture	%	14	14	26	31	0.30	6090874

Maxxam ID		EE8576	EE8577	EE8578	EE8579		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		11:10	11:20	11:30	11:40		
COC Number		A154886	A154886	A154886	A154886		
	UNITS	APEC1-2	APEC1-3	APEC1-4	APEC1-5	RDL	QC Batch
		@ 0.25-0.4M	@ 0.25-0.5M	@ 0.5-0.75M	@ 0.75-1M		
Physical Properties							
Moisture	%	66	12	11	11	0.30	6090874
Sieve - Pan	%	N/A	N/A	39	N/A	0.20	6116609
Sieve - #200 (>0.075mm)	%	N/A	N/A	61	N/A	0.20	6116609
Grain Size	%	N/A	N/A	COARSE	N/A	0.20	6116609

Moisture	%	12	41	12	11	0.30	6090874
Physical Properties	0,			10		0.00	0000074
			1				
			1 @ 0.3-0.5M	3 @ 0.3-0.5M	5 @ 0-0.15M		
		@ 0.25-0.5M	LAND FARM	LAND FARM	LAND FARM		
	UNITS	APEC1-6	INSIDE	INSIDE	INSIDE	RDL	QC Batch
COC Number		A154886	A154886	A154886	A154886		
		12:00	10:30	10:40	10:50		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
Maxxam ID		EE8580	EE8581	EE8582	EE8583		



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		EE8584	EE8721		EE8722	EE8769		
Sampling Date		2012/08/11	2012/08/11		2012/08/11	2012/08/11		
		13:00	13:10		13:00	14:30		
COC Number		A154887	A154887		A154887	A154888		
	UNITS	APEC5-1	APEC5-2	QC Batch	APEC5-3	AEC1-13	RDL	QC Batch
		@ 0.25-0.5M	@ 0.5-0.75M		@ 0.25-0.5M	@ 0.5-0.75M		
Physical Properties								
Moisture	%	12	13	6090874	25	6.6	0.30	6091444
Sieve - Pan	%	N/A	56	6116609	N/A	N/A	0.20	N/A
Sieve - #200 (>0.075mm)	%	N/A	44	6116609	N/A	N/A	0.20	N/A
Grain Size	%	N/A	FINE	6116609	N/A	N/A	0.20	N/A
N/A = Not Applicable								

Maxxam ID		EE8770	EE8771	EE8772	EE8773		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
-		14:30	14:40	14:40	14:50		
COC Number		A154888	A154888	A154888	A154888		
	UNITS	AEC1-14	AEC1-15	AEC1-16	AEC1-17	RDL	QC Batch
		@ 0.25-0.5M	@ 0.5-0.75M	@ 0.5-0.75M	@ 0.75-1M		
				_			
Physical Properties							
Physical Properties Moisture	%	6.3	11	8.8	11	0.30	6091444

	EE9774	EE9775	EE9776	EE0777		
						1
		1				
\longrightarrow						
	A154888	A154888	A154888	A154888		
UNITS	AEC1-18	AEC1-19	AEC1-20	AEC1-21	RDL	QC Batch
	@ 0.75-1M	@ 0.25-0.5M	@ 0.5-0.75M	@ 0.75-1M		
%	12	7.3	6.8	13	0.30	6091444
		•	•			•
		@ 0.75-1M	2012/08/11 2012/08/11 14:50 15:00 A154888 A154888 UNITS AEC1-18 AEC1-19 @ 0.75-1M @ 0.25-0.5M	2012/08/11 2012/08/11 2012/08/11 14:50 15:00 15:00 A154888	2012/08/11 2012/08/11 2012/08/11 2012/08/11 14:50 15:00 15:10 15:10	2012/08/11 2012/08/11 2012/08/11 2012/08/11 15:00 15:10



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		EE8483	EE8484	EE8486	EE8488		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		13:50	13:45	14:00	14:10		
COC Number		A154884	A154884	A154884	A154884		
	UNITS	AEC1-2	AEC1-3	AEC1-5	AEC1-7	RDL	QC Batch
		@ 0.25-0.5M	@ 0.25-0.5M	@ 0.25-0.5M	@ 0.2-0.4M		
Fort Bot Hoods and an			1	1	1		1
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	88	<10	<10	10	6100111
F3 (C16-C34 Hydrocarbons)	mg/kg	15	38	<10	17	10	6100111
F4 (C34-C50 Hydrocarbons)	mg/kg	<10	<10	<10	<10	10	6100111
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	N/A	6100111
Surrogate Recovery (%)							
O-TERPHENYL (sur.)	%	107	96	94	90	N/A	6100111

RDL = Reportable Detection Limit

Maxxam ID		EE8491	EE8492	EE8493	EE8494		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		13:40	08:30	08:35	08:40		
COC Number		A154884	A154884	A154884	A154884		
	UNITS	AEC1-3	AEC2-1	AEC2-1	AEC2-2	RDL	QC Batch
		@ 0.5-0.75M	@ 0.75-1M	@ 1.5-1.75M	@ 0.75-1M		
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	16	11000	6000	<10	10	6100111
F3 (C16-C34 Hydrocarbons)	mg/kg	<10	1700	680	<10	10	6100111
F4 (C34-C50 Hydrocarbons)	mg/kg	<10	14	<10	<10	10	6100111
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	N/A	6100111
Surrogate Recovery (%)							
O-TERPHENYL (sur.)	%	88	92	91	95	N/A	6100111

N/A = Not Applicable



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

PETROLEUM HYDROCARBONS (CCME)

1		@ 1.25-1.5	@ 0.5-0.7M	@ 0.75-1M	@ 0.75-1M		
	UNITS	AEC2-3	AEC2-4	AEC2-5	AEC2-6	RDL	QC Batch
COC Number		A154885	A154885	A154885	A154885		
		08:50	09:00	09:10	09:20		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
Maxxam ID		EE8495	EE8513	EE8514	EE8515		

Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	4100	1800	<10	<10	10	6100111
F3 (C16-C34 Hydrocarbons)	mg/kg	800	600	<10	<10	10	6100111
F4 (C34-C50 Hydrocarbons)	mg/kg	28	<10	<10	17	10	6100111
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	N/A	6100111
Surrogate Recovery (%)							
O-TERPHENYL (sur.)	%	87	91	92	98	N/A	6100111

N/A = Not Applicable

RDL = Reportable Detection Limit

		@ 0.75-1M	@ 0.75-1M	@ 0.75-1M		@ 0.25-0.5M		
	UNITS	AEC2-7	AEC2-8	AEC3-1	QC Batch	AEC3-3	RDL	QC Batch
COC Number		A154885	A154885	A154885		A154885		
		09:30	09:40	12:10		12:30		
Sampling Date		2012/08/11	2012/08/11	2012/08/11		2012/08/11		
Maxxam ID		EE8516	EE8517	EE8518		EE8520		

Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	41	7600	<10	6100111	<10	10	6108077
F3 (C16-C34 Hydrocarbons)	mg/kg	<10	1500	65	6100111	74	10	6108077
F4 (C34-C50 Hydrocarbons)	mg/kg	<10	50	16	6100111	28	10	6108077
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	6100111	Yes	N/A	6108077
Surrogate Recovery (%)								
O-TERPHENYL (sur.)	%	89	91	93	6100111	104	N/A	6108077

N/A = Not Applicable



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		EE8522	EE8524	EE8574	EE8575		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		12:50	10:00	10:20	11:00		
COC Number		A154885	A154886	A154886	A154886		
	UNITS	AEC3-5	AEC6-2	AEC6-4	APEC1-1	RDL	QC Batch
		@ 0.75-1M	@ 0.75-1M	@ 0.75-1M	@ 0.25-0.5M		
,	•				_		•

Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	10	6108077
F3 (C16-C34 Hydrocarbons)	mg/kg	18	27	190	280	10	6108077
F4 (C34-C50 Hydrocarbons)	mg/kg	<10	<10	60	150	10	6108077
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	N/A	6108077
Surrogate Recovery (%)							
O-TERPHENYL (sur.)	%	98	89	101	98	N/A	6108077

N/A = Not Applicable

RDL = Reportable Detection Limit

Maxxam ID		EE8577	EE8578		EE8580		EE8581		
Sampling Date		2012/08/11	2012/08/11		2012/08/11		2012/08/11		
		11:20	11:30		12:00		10:30		
COC Number		A154886	A154886		A154886		A154886		
	UNITS	APEC1-3	APEC1-4	RDL	APEC1-6	RDL	INSIDE	RDL	QC Batch
		@ 0.25-0.5M	@ 0.5-0.75M		@ 0.25-0.5M		LAND FARM		
							1 @ 0.3-0.5M		
Ext. Pet. Hydrocarbon									

Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	10	<10	10	47000	10	6108077
F3 (C16-C34 Hydrocarbons)	mg/kg	<10	10	10	<10	10	9600	10	6108077
F4 (C34-C50 Hydrocarbons)	mg/kg	<10	<10	10	<20 (1)	20	230	10	6108077
Reached Baseline at C50	mg/kg	Yes	Yes	N/A	Yes	N/A	Yes	N/A	6108077
Surrogate Recovery (%)									
O-TERPHENYL (sur.)	%	94	107	N/A	102	N/A	72	N/A	6108077

N/A = Not Applicable

RDL = Reportable Detection Limit

(1) Detection limit raised due to interferent.



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

PETROLEUM HYDROCARBONS (CCME)

	EE8582	EE8583	EE8584	EE8721		
	2012/08/11	2012/08/11	2012/08/11	2012/08/11		
	10:40	10:50	13:00	13:10		
	A154886	A154886	A154887	A154887		
UNITS	INSIDE	INSIDE	APEC5-1	APEC5-2	RDL	QC Batch
	LAND FARM	LAND FARM	@ 0.25-0.5M	@ 0.5-0.75M		
	3 @ 0.3-0.5M	5 @ 0-0.15M				
	UNITS	2012/08/11 10:40 A154886 UNITS INSIDE LAND FARM	2012/08/11 2012/08/11 10:40 10:50 A154886 A154886 UNITS INSIDE LAND FARM LAND FARM	2012/08/11 2012/08/11 2012/08/11 10:40 10:50 13:00 A154886 A154886 A154887 UNITS INSIDE LAND FARM LAND FARM @ 0.25-0.5M	2012/08/11 2012/08/11 2012/08/11 2012/08/11 10:40 10:50 13:00 13:10	2012/08/11 2012/08/11 2012/08/11 2012/08/11 10:40 10:50 13:00 13:10

Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	2700	2700	<10	<10	10	6108077
F3 (C16-C34 Hydrocarbons)	mg/kg	1400	2100	28	120	10	6108077
F4 (C34-C50 Hydrocarbons)	mg/kg	27	76	<10	33	10	6108077
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	N/A	6108077
Surrogate Recovery (%)							
O-TERPHENYL (sur.)	%	91	86	91	86	N/A	6108077

N/A = Not Applicable

RDL = Reportable Detection Limit

	UNITS	APEC5-3 @ 0.25-0.5M	AEC1-13 @ 0.5-0.75M	AEC1-14 @ 0,25-0.5M	QC Batch	AEC1-15 @ 0.5-0.75M	RDL	QC Batch
COC Number		A154887	A154888	A154888		A154888		
		13:00	14:30	14:30		14:40		
Sampling Date		2012/08/11	2012/08/11	2012/08/11		2012/08/11		
Maxxam ID		EE8722	EE8769	EE8770		EE8771		

Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	6108077	<10	10	6100111
F3 (C16-C34 Hydrocarbons)	mg/kg	180	48	83	6108077	67	10	6100111
F4 (C34-C50 Hydrocarbons)	mg/kg	52	13	23	6108077	46	10	6100111
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	6108077	Yes	N/A	6100111
Surrogate Recovery (%)								
O-TERPHENYL (sur.)	%	85	90	93	6108077	106	N/A	6100111

N/A = Not Applicable RDL = Reportable Detection Limit



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		EE8772	EE8773	EE8774	EE8775		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		14:40	14:50	14:50	15:00		
COC Number		A154888	A154888	A154888	A154888		
	UNITS	AEC1-16	AEC1-17	AEC1-18	AEC1-19	RDL	QC Batch
		@ 0.5-0.75M	@ 0.75-1M	@ 0.75-1M	@ 0.25-0.5M		

Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	16	<10	<10	<10	10	6100111
F3 (C16-C34 Hydrocarbons)	mg/kg	<10	<10	31	74	10	6100111
F4 (C34-C50 Hydrocarbons)	mg/kg	<10	<10	<10	11	10	6100111
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	N/A	6100111
Surrogate Recovery (%)							
O-TERPHENYL (sur.)	%	101	101	96	100	N/A	6100111

N/A = Not Applicable

RDL = Reportable Detection Limit

Maxxam ID		EE8776	EE8777		
Sampling Date		2012/08/11	2012/08/11		
		15:00	15:10		
COC Number		A154888	A154888		
	UNITS	AEC1-20	AEC1-21	RDL	QC Batch
		@ 0.5-0.75M	@ 0.75-1M		

Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	10	6108077
F3 (C16-C34 Hydrocarbons)	mg/kg	22	78	10	6108077
F4 (C34-C50 Hydrocarbons)	mg/kg	<10	23	10	6108077
Reached Baseline at C50	mg/kg	Yes	Yes	N/A	6108077
Surrogate Recovery (%)					
O-TERPHENYL (sur.)	%	85	94	N/A	6108077

N/A = Not Applicable



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID Sampling Date		EE8483 2012/08/11	EE8484 2012/08/11	EE8486 2012/08/11	EE8488 2012/08/11		
Sampania Land		13:50	13:45	14:00	14:10		
COC Number		A154884	A154884	A154884	A154884		
	UNITS	AEC1-2	AEC1-3	AEC1-5	AEC1-7	RDL	QC Batch
		@ 0.25-0.5M	@ 0.25-0.5M	@ 0.25-0.5M	@ 0.2-0.4M		

Volatiles							
voiatiles							
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	6098991
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	6098991
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	6098991
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	6098991
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	6098991
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	6098991
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	12	6098991
(C6-C10)	mg/kg	<12	<12	<12	<12	12	6098991
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	106	99	86	109	N/A	6098991
4-BROMOFLUOROBENZENE (sur.)	%	99	109	90	102	N/A	6098991
D10-ETHYLBENZENE (sur.)	%	97	96	85	103	N/A	6098991
D4-1,2-DICHLOROETHANE (sur.)	%	91	84	73	87	N/A	6098991

N/A = Not Applicable



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (SOIL)

	UNITS	AEC1-3 @ 0.5-0.75M	AEC2-1 @ 0.75-1M	AEC2-1 @ 1.5-1.75M	AEC2-2 @ 0.75-1M	RDL	QC Batch
COC Number		A154884	A154884	A154884	A154884		
		13:40	08:30	08:35	08:40		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
Maxxam ID		EE8491	EE8492	EE8493	EE8494		

			1		1		
Volatiles							
Benzene	mg/kg	<0.0050	0.034	0.087	<0.0050	0.0050	6098991
Toluene	mg/kg	<0.020	2.0	1.8	<0.020	0.020	6098991
Ethylbenzene	mg/kg	<0.010	7.3	9.1	<0.010	0.010	6098991
Xylenes (Total)	mg/kg	<0.040	100	55	<0.040	0.040	6098991
m & p-Xylene	mg/kg	<0.040	59	34	<0.040	0.040	6098991
o-Xylene	mg/kg	<0.020	41	21	<0.020	0.020	6098991
F1 (C6-C10) - BTEX	mg/kg	<12	5600	3000	<12	12	6098991
(C6-C10)	mg/kg	<12	5800	3100	<12	12	6098991
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	105	87	95	106	N/A	6098991
4-BROMOFLUOROBENZENE (sur.)	%	103	83	107	102	N/A	6098991
D10-ETHYLBENZENE (sur.)	%	98	88	101	103	N/A	6098991
D4-1,2-DICHLOROETHANE (sur.)	%	85	74	78	90	N/A	6098991
	-						

N/A = Not Applicable



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (SOIL)

	UNITS	AEC2-3 @ 1.25-1.5	RDL	AEC2-4 @ 0.5-0.7M	RDL	AEC2-5 @ 0.75-1M	RDL	QC Batch
COC Number		A154885		A154885		A154885		
		08:50		09:00		09:10		
Sampling Date		2012/08/11		2012/08/11		2012/08/11		
Maxxam ID		EE8495		EE8513		EE8514		

Volatiles								
Benzene	mg/kg	0.077	0.0050	<0.0050	0.0050	0.0090	0.0050	6098991
Toluene	mg/kg	0.59	0.020	<0.020	0.020	0.11	0.020	6098991
Ethylbenzene	mg/kg	2.8	0.010	<0.012 (1)	0.012	0.032	0.010	6098991
Xylenes (Total)	mg/kg	35	0.040	<0.040	0.040	0.16	0.040	6098991
m & p-Xylene	mg/kg	23	0.040	<0.040	0.040	0.10	0.040	6098991
o-Xylene	mg/kg	12	0.020	<0.020	0.020	0.062	0.020	6098991
F1 (C6-C10) - BTEX	mg/kg	500	12	150	12	<12	12	6098991
(C6-C10)	mg/kg	530	12	150	12	<12	12	6098991
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	100	N/A	104	N/A	108	N/A	6098991
4-BROMOFLUOROBENZENE (sur.)	%	92	N/A	100	N/A	93	N/A	6098991
D10-ETHYLBENZENE (sur.)	%	110	N/A	118	N/A	107	N/A	6098991
D4-1,2-DICHLOROETHANE (sur.)	%	65	N/A	72	N/A	73	N/A	6098991

N/A = Not Applicable

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



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		EE8515 2012/08/11	EE8516 2012/08/11	EE8517 2012/08/11	EE8518 2012/08/11		
Sampling Date		09:20	09:30	09:40	12:10		
COC Number		A154885	A154885	A154885	A154885		
	UNITS	AEC2-6	AEC2-7	AEC2-8	AEC3-1	RDL	QC Batch
		@ 0.75-1M	@ 0.75-1M	@ 0.75-1M	@ 0.75-1M		

			l			1	
Volatiles							
Benzene	mg/kg	<0.0050	<0.0050	0.13	<0.0050	0.0050	6098991
Toluene	mg/kg	<0.020	<0.020	4.3	<0.020	0.020	6098991
Ethylbenzene	mg/kg	<0.010	0.013	3.9	<0.010	0.010	6098991
Xylenes (Total)	mg/kg	<0.040	0.079	34	<0.040	0.040	6098991
m & p-Xylene	mg/kg	<0.040	0.050	22	<0.040	0.040	6098991
o-Xylene	mg/kg	<0.020	0.029	12	<0.020	0.020	6098991
F1 (C6-C10) - BTEX	mg/kg	<12	<12	630	<12	12	6098991
(C6-C10)	mg/kg	<12	<12	670	<12	12	6098991
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	100	103	103	99	N/A	6098991
4-BROMOFLUOROBENZENE (sur.)	%	92	90	91	92	N/A	6098991
D10-ETHYLBENZENE (sur.)	%	103	104	95	103	N/A	6098991
D4-1,2-DICHLOROETHANE (sur.)	%	75	74	76	71	N/A	6098991

N/A = Not Applicable



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (SOIL)

		@ 0.25-0.5M	@ 0.75-1M	@ 0.75-1M	@ 0.75-1M		
	UNITS	AEC3-3	AEC3-5	AEC6-2	AEC6-4	RDL	QC Batch
COC Number		A154885	A154885	A154886	A154886		
		12:30	12:50	10:00	10:20		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
Maxxam ID		EE8520	EE8522	EE8524	EE8574		

			1			1	1
Volatiles							
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	6098991
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	6098991
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	6098991
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	6098991
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	6098991
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	6098991
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	12	6098991
(C6-C10)	mg/kg	<12	<12	<12	<12	12	6098991
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	103	106	107	87	N/A	6098991
4-BROMOFLUOROBENZENE (sur.)	%	102	93	90	75	N/A	6098991
D10-ETHYLBENZENE (sur.)	%	98	105	100	79	N/A	6098991
D4-1,2-DICHLOROETHANE (sur.)	%	78	78	77	74	N/A	6098991

N/A = Not Applicable



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (SOIL)

		@ 0.25-0.5M		@ 0.25-0.5M	@ 0.5-0.75M		
	UNITS	APEC1-1	QC Batch	APEC1-3	APEC1-4	RDL	QC Batch
COC Number		A154886		A154886	A154886		
		11:00		11:20	11:30		
Sampling Date		2012/08/11		2012/08/11	2012/08/11		
Maxxam ID		EE8575		EE8577	EE8578		

Volatiles							
Benzene	mg/kg	<0.0050	6098991	<0.0050	<0.0050	0.0050	6098994
Toluene	mg/kg	<0.020	6098991	<0.020	<0.020	0.020	6098994
Ethylbenzene	mg/kg	<0.010	6098991	<0.010	<0.010	0.010	6098994
Xylenes (Total)	mg/kg	<0.040	6098991	<0.040	<0.040	0.040	6098994
m & p-Xylene	mg/kg	<0.040	6098991	<0.040	<0.040	0.040	6098994
o-Xylene	mg/kg	<0.020	6098991	<0.020	<0.020	0.020	6098994
F1 (C6-C10) - BTEX	mg/kg	<12	6098991	<12	<12	12	6098994
(C6-C10)	mg/kg	<12	6098991	<12	<12	12	6098994
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	96	6098991	108	110	N/A	6098994
4-BROMOFLUOROBENZENE (sur.)	%	83	6098991	97	126	N/A	6098994
D10-ETHYLBENZENE (sur.)	%	88	6098991	86	87	N/A	6098994
D4-1,2-DICHLOROETHANE (sur.)	%	79	6098991	117	130	N/A	6098994
	•						

N/A = Not Applicable RDL = Reportable Detection Limit



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		EE8580	EE8581	EE8582	EE8583		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		12:00	10:30	10:40	10:50		
COC Number		A154886	A154886	A154886	A154886		
	UNITS	APEC1-6	INSIDE	INSIDE	INSIDE	RDL	QC Batch
		@ 0.25-0.5M	LAND FARM	LAND FARM	LAND FARM		
			1 @ 0.3-0.5M	3 @ 0.3-0.5M	5 @ 0-0.15M		
Volatiles							
Benzene	mg/kg	<0.0050	0.33	<0.0050	<0.0050	0.0050	6098994

Volatiles							
Benzene	mg/kg	<0.0050	0.33	<0.0050	<0.0050	0.0050	6098994
Toluene	mg/kg	<0.020	25	<0.020	0.045	0.020	6098994
Ethylbenzene	mg/kg	<0.010	17	<0.010	0.014	0.010	6098994
Xylenes (Total)	mg/kg	<0.040	140	<0.040	<0.040	0.040	6098994
m & p-Xylene	mg/kg	<0.040	73	<0.040	<0.040	0.040	6098994
o-Xylene	mg/kg	<0.020	68	<0.020	<0.020	0.020	6098994
F1 (C6-C10) - BTEX	mg/kg	<12	5100	76	<12	12	6098994
(C6-C10)	mg/kg	<12	5300	76	<12	12	6098994
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	105	115	97	97	N/A	6098994
4-BROMOFLUOROBENZENE (sur.)	%	104	93	106	104	N/A	6098994
D10-ETHYLBENZENE (sur.)	%	85	83	79	96	N/A	6098994
D4-1,2-DICHLOROETHANE (sur.)	%	117	127	100	126	N/A	6098994

N/A = Not Applicable RDL = Reportable Detection Limit



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (SOIL)

		@ 0.25-0.5M	@ 0.5-0.75M	@ 0.25-0.5M	@ 0.5-0.75M		
	UNITS	APEC5-1	APEC5-2	APEC5-3	AEC1-13	RDL	QC Batch
COC Number		A154887	A154887	A154887	A154888		
		13:00	13:10	13:00	14:30		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
Maxxam ID		EE8584	EE8721	EE8722	EE8769		

Volatiles							
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	6098994
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	6098994
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	6098994
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	6098994
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	6098994
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	6098994
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	12	6098994
(C6-C10)	mg/kg	<12	<12	<12	<12	12	6098994
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	100	86	97	90	N/A	6098994
4-BROMOFLUOROBENZENE (sur.)	%	98	97	94	90	N/A	6098994
D10-ETHYLBENZENE (sur.)	%	85	83	82	95	N/A	6098994
D4-1,2-DICHLOROETHANE (sur.)	%	108	99	112	81	N/A	6098994

N/A = Not Applicable



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		EE8770	EE8771	EE8772	EE8773		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		14:30	14:40	14:40	14:50		
COC Number		A154888	A154888	A154888	A154888		
	UNITS	AEC1-14	AEC1-15	AEC1-16	AEC1-17	RDL	QC Batch
		@ 0.25-0.5M	@ 0.5-0.75M	@ 0.5-0.75M	@ 0.75-1M		

Volatiles							
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	6098994
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	6098994
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	6098994
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	6098994
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	6098994
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	6098994
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	12	6098994
(C6-C10)	mg/kg	<12	<12	<12	<12	12	6098994
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	100	100	100	108	N/A	6098994
4-BROMOFLUOROBENZENE (sur.)	%	102	113	96	97	N/A	6098994
D10-ETHYLBENZENE (sur.)	%	87	83	93	88	N/A	6098994
D4-1,2-DICHLOROETHANE (sur.)	%	105	107	113	116	N/A	6098994
						-	

N/A = Not Applicable



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		EE8774	EE8775	EE8776	EE8777		
Sampling Date		2012/08/11	2012/08/11	2012/08/11	2012/08/11		
		14:50	15:00	15:00	15:10		
COC Number		A154888	A154888	A154888	A154888		
	UNITS	AEC1-18	AEC1-19	AEC1-20	AEC1-21	RDL	QC Batch
		@ 0.75-1M	@ 0.25-0.5M	@ 0.5-0.75M	@ 0.75-1M		

			1	1		1	1
Volatiles							
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	6098994
Toluene	mg/kg	<0.020	<0.020	<0.020	0.35	0.020	6098994
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	6098994
Xylenes (Total)	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	6098994
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	6098994
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	6098994
F1 (C6-C10) - BTEX	mg/kg	<12	<12	<12	<12	12	6098994
(C6-C10)	mg/kg	<12	<12	<12	<12	12	6098994
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	101	102	96	97	N/A	6098994
4-BROMOFLUOROBENZENE (sur.)	%	85	102	100	101	N/A	6098994
D10-ETHYLBENZENE (sur.)	%	83	90	92	85	N/A	6098994
D4-1,2-DICHLOROETHANE (sur.)	%	97	108	112	109	N/A	6098994

N/A = Not Applicable



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		EE8758		EE8760		EE8763		
Sampling Date		2012/08/12		2012/08/12		2012/08/12		
		09:00		09:30		10:00		
COC Number		A154887		A154887		A154887		
	UNITS	GW-1 BOSTON	RDL	GW-3 BOSTON	RDL	GW-5 BOSTON	RDL	QC Batch

Calculated Parameters								
Anion Sum	meq/L	36	N/A	29	N/A	110	N/A	6085516
Cation Sum	meq/L	36	N/A	28	N/A	95	N/A	6085516
Hardness (CaCO3)	mg/L	1500	0.50	1200	0.50	2900	0.50	6085502
Ion Balance	N/A	0.99	0.010	0.97	0.010	0.86	0.010	6085505
Dissolved Nitrate (NO3)	mg/L	2.1	0.066	83	0.66	0.49	0.13	6085549
Nitrate plus Nitrite (N)	mg/L	0.47	0.015	19	0.15	0.11	0.030	6085574
Dissolved Nitrite (NO2)	mg/L	<0.049	0.049	0.18	0.099	<0.099	0.099	6085549
Total Dissolved Solids	mg/L	2000	10	1700	10	5700	10	6085577
Misc. Inorganics								
Conductivity	uS/cm	3800	1.0	3000	1.0	11000	1.0	6087222
рН	N/A	7.46	N/A	7.21	N/A	6.76	N/A	6087225
Anions								
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	6087215
Alkalinity (Total as CaCO3)	mg/L	54	0.50	24	0.50	180	0.50	6087215
Bicarbonate (HCO3)	mg/L	66	0.50	29	0.50	220	0.50	6087215
Carbonate (CO3)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	6087215
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	6087215
Dissolved Sulphate (SO4)	mg/L	200	1.0	510 (1)	5.0	310 (1)	2.0	6094857
Dissolved Chloride (CI)	mg/L	1100 (1)	10	590 (1)	5.0	3600 (1)	25	6094856
Nutrients								
Dissolved Nitrite (N)	mg/L	<0.015 (2)	0.015	0.054 (3)	0.030	<0.030 (4)	0.030	6097798
Dissolved Nitrate (N)	mg/L	0.47 (5)	0.015	19 (6)	0.15	0.11 (4)	0.030	6097798

RDL = Reportable Detection Limit

- (1) Detection limits raised due to dilution to bring analyte within the calibrated range.
- (2) Detection limits raised due to matrix interference.

Sample was analyzed after holding time expired.

(3) Sample was analyzed after holding time expired.

Detection limits raised due to sample matrix.

(4) Sample was analyzed after holding time expired.

Detection limits raised due to matrix interference.

- (5) Sample was analyzed after holding time expired. Detection limits raised due to matrix interference.
- (6) Sample was analyzed after holding time expired. Detection limits raised due to dilution to bring analyte within the calibrated range.



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		EE8765			EE8766		EE8767		
Sampling Date		2012/08/12			2012/08/12		2012/08/12		
, 3		11:20			11:40		13:30		
COC Number		A154887			A154887		A154887		
	UNITS	PW-2	RDI	QC Batch	PW-5	RDL	W-1	RDL	QC Batch
	UNITS		INDL	ac Dateii	1 44-2	INDL	44-1	INDL	QC Datch
	ONITS	1 44-2	INDL	QO Daton	1 44-5	INDL	VV-1	INDL	QC Dateil
Calculated Parameters	ONITS	1 W-Z	INDE	QO Batem	1 W-3		VV-1	INDL	QC Batch

Calculated Parameters									
Anion Sum	meq/L	100	N/A	6085516	N/A	N/A	55	N/A	6086211
Cation Sum	meq/L	91	N/A	6085516	N/A	N/A	50	N/A	6086211
Hardness (CaCO3)	mg/L	3300	0.50	6086209	N/A	0.50	1100	0.50	6086209
Ion Balance	N/A	0.90	0.010	6085505	N/A	0.010	0.92	0.010	6086210
Dissolved Nitrate (NO3)	mg/L	2.0	0.13	6085549	<0.066	0.066	0.11	0.066	6085549
Nitrate plus Nitrite (N)	mg/L	0.45	0.030	6085574	<0.015	0.015	0.025	0.015	6086212
Dissolved Nitrite (NO2)	mg/L	<0.099	0.099	6085549	<0.049	0.049	<0.049	0.049	6085549
Total Dissolved Solids	mg/L	5400	10	6085577	N/A	10	3000	10	6086213
Misc. Inorganics									
Conductivity	uS/cm	8900	1.0	6087222	8600	1.0	5200	1.0	6087222
рН	N/A	6.77	N/A	6087225	6.96	N/A	7.82	N/A	6087225
Anions									
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	6087215	<0.50	0.50	<0.50	0.50	6087215
Alkalinity (Total as CaCO3)	mg/L	38	0.50	6087215	75	0.50	520	0.50	6087215
Bicarbonate (HCO3)	mg/L	46	0.50	6087215	91	0.50	640	0.50	6087215
Carbonate (CO3)	mg/L	<0.50	0.50	6087215	<0.50	0.50	<0.50	0.50	6087215
Hydroxide (OH)	mg/L	<0.50	0.50	6087215	<0.50	0.50	<0.50	0.50	6087215
Dissolved Sulphate (SO4)	mg/L	1000 (1)	10	6094857	98 (2)	10	540 (1)	5.0	6094857
Dissolved Chloride (CI)	mg/L	2800 (1)	20	6094856	3200 (1)	50	1200 (1)	10	6094856
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.030 (3)	0.030	6097798	<0.015 (4)	0.015	<0.015 (3)	0.015	6097798
Dissolved Nitrate (N)	mg/L	0.45 (3)	0.030	6097798	<0.015 (4)	0.015	0.025 (3)	0.015	6097798

N/A = Not Applicable

RDL = Reportable Detection Limit

- (1) Detection limits raised due to dilution to bring analyte within the calibrated range.
- (2) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly(3) Sample was analyzed after holding time expired.

Detection limits raised due to matrix interference.

(4) Sample was analyzed after holding time expired.

Detection limits raised due to insufficient sample volume.



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		EE8768		EE8778		EE8779		
Sampling Date		2012/08/12		2012/08/12		2012/08/12		
		14:00		10:10		10:20		
COC Number	LINUTO	A154888	BBI	A154888	201	A154888	DD1	00 D-1-1
	UNITS	W-3	RDL	SEEP SAMPLE 1 (SS1)	RDL	SEEP SAMPLE 2 (SS2)	RDL	QC Batch
				OAWII EE 1 (001)		3AWI LL 2 (332)		<u> </u>
Calculated Parameters								
Anion Sum	meq/L	20	N/A	29	N/A	22	N/A	6086211
Cation Sum	meq/L	19	N/A	30	N/A	24	N/A	6086211
Hardness (CaCO3)	mg/L	470	0.50	1300	0.50	1000	0.50	6086209
Ion Balance	N/A	0.93	0.010	1.1	0.010	1.1	0.010	6086210
Dissolved Nitrate (NO3)	mg/L	0.018	0.013	160	0.066	0.035	0.013	6085549
Nitrate plus Nitrite (N)	mg/L	0.0040	0.0030	36	0.015	0.0080	0.0030	6086212
Dissolved Nitrite (NO2)	mg/L	<0.0099	0.0099	0.039	0.0099	<0.0099	0.0099	6085549
Total Dissolved Solids	mg/L	1100	10	1800	10	1300	10	6086213
Misc. Inorganics								
Conductivity	uS/cm	2100	1.0	3000	1.0	2400	1.0	6087222
рН	N/A	6.84	N/A	7.19	N/A	7.11	N/A	6087225
Anions								
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	6087215
Alkalinity (Total as CaCO3)	mg/L	200	0.50	24	0.50	17	0.50	6087215
Bicarbonate (HCO3)	mg/L	250	0.50	29	0.50	21	0.50	6087215
Carbonate (CO3)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	6087215
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	6087215
Dissolved Sulphate (SO4)	mg/L	190	1.0	470 (1)	5.0	260 (1)	2.0	6094857
Dissolved Chloride (CI)	mg/L	430 (1)	5.0	560 (1)	5.0	580 (1)	5.0	6094856
Nutrients								
Dissolved Nitrite (N)	mg/L	<0.0030 (2)	0.0030	0.012 (2)	0.0030	<0.0030 (2)	0.0030	6097798

0.0030

0.015

36 (3)

0.0030

0.0080 (2)

6097798

RDL = Reportable Detection Limit

Dissolved Nitrate (N)

(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

0.0040 (2)

mg/L

(2) Sample was analyzed after holding time expired.
(3) Sample was analyzed after holding time expired.
Detection limits raised due to dilution to bring analyte within the calibrated range.



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		EE8758		EE8759	EE8760	EE8761		
Sampling Date		2012/08/12		2012/08/12	2012/08/12	2012/08/12		
		09:00		09:15	09:30	09:45		
COC Number		A154887		A154887	A154887	A154887		
	UNITS	GW-1 BOSTON	RDL	GW-2 BOSTON	GW-3 BOSTON	GW-4 BOSTON	RDL	QC Batch

Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.30 (1)	0.30	<0.80 (1)	<0.80 (1)	<0.80 (1)	0.80	6090795
Surrogate Recovery (%)								
O-TERPHENYL (sur.)	%	110	N/A	104	108	92	N/A	6090795

N/A = Not Applicable

RDL = Reportable Detection Limit

(1) Detection limit raised based on sample volume used for analysis

·					•			
	UNITS	GW-5 BOSTON	RDL	PW-1	RDL	PW-2	RDL	QC Batch
COC Number		A154887		A154887		A154887		
		10:00		11:00		11:20		
Sampling Date		2012/08/12		2012/08/12		2012/08/12		
Maxxam ID		EE8763		EE8764		EE8765		

Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.30 (1)	0.30	<0.50 (1)	0.50	<0.30 (1)	0.30	6090795
Surrogate Recovery (%)								
O-TERPHENYL (sur.)	%	89	N/A	91	N/A	92	N/A	6090795

N/A = Not Applicable

RDL = Reportable Detection Limit

(1) Detection limit raised based on sample volume used for analysis

Maxxam ID		EE8766		EE8767	EE8768	EE8778		
Sampling Date		2012/08/12		2012/08/12	2012/08/12	2012/08/12		
		11:40		13:30	14:00	10:10		
COC Number		A154887		A154887	A154888	A154888		
	UNITS	PW-5	RDL	W-1	W-3	SEEP	RDL	QC Batch
						SAMPLE 1 (SS1)		
				·				·

Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.40 (1)	0.40	<0.30 (1)	<0.30 (1)	<0.30 (1)	0.30	6090795
Surrogate Recovery (%)								
O-TERPHENYL (sur.)	%	110	N/A	102	107	114	N/A	6090795

N/A = Not Applicable

RDL = Reportable Detection Limit

(1) Detection limit raised based on sample volume used for analysis



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

PETROLEUM HYDROCARBONS (CCME)

	UNITS	SEEP SAMPLE 2 (SS2)	RDL	QC Batch
COC Number		A154888		
		10:20		
Sampling Date		2012/08/12		
Maxxam ID		EE8779		

Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	mg/L	<0.30 (1)	0.30	6090795
Surrogate Recovery (%)				
O-TERPHENYL (sur.)	%	109	N/A	6090795

N/A = Not Applicable

RDL = Reportable Detection Limit

(1) Detection limit raised based on sample volume used for analysis



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		EE8758	EE8760		EE8763		
Sampling Date		2012/08/12	2012/08/12		2012/08/12		
		09:00	09:30		10:00		
COC Number		A154887	A154887		A154887		
	UNITS	GW-1 BOSTON	GW-3 BOSTON	RDL	GW-5 BOSTON	RDL	QC Batch

Elements							
Dissolved Calcium (Ca)	mg/L	400	340	0.30	390	0.30	6086248
Dissolved Iron (Fe)	mg/L	0.22	0.53	0.060	0.71	0.060	6086248
Dissolved Magnesium (Mg)	mg/L	120	76	0.20	480 (1)	1.0	6086248
Dissolved Manganese (Mn)	mg/L	1.4	0.94	0.0040	2.5	0.0040	6086248
Dissolved Potassium (K)	mg/L	9.7	30	0.30	44	0.30	6086248
Dissolved Sodium (Na)	mg/L	130	100	0.50	810 (1)	2.5	6086248

RDL = Reportable Detection Limit

(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		EE8765		EE8767		EE8768		
Sampling Date		2012/08/12		2012/08/12		2012/08/12		
		11:20		13:30		14:00		
COC Number		A154887		A154887		A154888		
	UNITS	PW-2	RDL	W-1	RDL	W-3	RDL	QC Batch

Elements								
Dissolved Calcium (Ca)	mg/L	520 (1)	1.5	140	0.30	59	0.30	6086248
Dissolved Iron (Fe)	mg/L	0.52	0.060	0.36	0.060	0.31	0.060	6086248
Dissolved Magnesium (Mg)	mg/L	480	0.20	190	0.20	77	0.20	6086248
Dissolved Manganese (Mn)	mg/L	10	0.0040	0.45	0.0040	0.92	0.0040	6086248
Dissolved Potassium (K)	mg/L	20	0.30	54	0.30	25	0.30	6086248
Dissolved Sodium (Na)	mg/L	560 (1)	2.5	610 (1)	2.5	210	0.50	6086248

⁽¹⁾ Detection limits raised due to dilution to bring analyte within the calibrated range.



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

		SAMPLE 1 (SS1)	SAMPLE 2 (SS2)		
	UNITS	SEEP	SEEP	RDL	QC Batch
COC Number		A154888	A154888		
		10:10	10:20		
Sampling Date		2012/08/12	2012/08/12		
Maxxam ID		EE8778	EE8779		

Elements					
Dissolved Calcium (Ca)	mg/L	380	280	0.30	6086248
Dissolved Iron (Fe)	mg/L	0.17	0.45	0.060	6086248
Dissolved Magnesium (Mg)	mg/L	83	80	0.20	6086248
Dissolved Manganese (Mn)	mg/L	0.41	0.20	0.0040	6086248
Dissolved Potassium (K)	mg/L	29	2.5	0.30	6086248
Dissolved Sodium (Na)	mg/L	86	76	0.50	6086248



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		EE8758	EE8759	EE8760	EE8761		
Sampling Date		2012/08/12	2012/08/12	2012/08/12	2012/08/12		
		09:00	09:15	09:30	09:45		
COC Number		A154887	A154887	A154887	A154887		
	UNITS	GW-1 BOSTON	GW-2 BOSTON	GW-3 BOSTON	GW-4 BOSTON	RDL	QC Batch

Volatiles							
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	6091836
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	6091836
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	6091836
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	6091836
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	6091836
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	6091836
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	6091836
(C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	6091836
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	102	96	89	103	N/A	6091836
4-BROMOFLUOROBENZENE (sur.)	%	98	86	77	88	N/A	6091836
D4-1,2-DICHLOROETHANE (sur.)	%	122	112	103	114	N/A	6091836

N/A = Not Applicable RDL = Reportable Detection Limit



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		EE8763	EE8764	EE8765	EE8766		
Sampling Date		2012/08/12	2012/08/12	2012/08/12	2012/08/12		
		10:00	11:00	11:20	11:40		
COC Number		A154887	A154887	A154887	A154887		
	UNITS	GW-5 BOSTON	PW-1	PW-2	PW-5	RDL	QC Batch

Volatiles							
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	6091836
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	6091836
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	6091836
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	6091836
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	6091836
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	6091836
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	6091836
(C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	6091836
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	104	95	103	102	N/A	6091836
4-BROMOFLUOROBENZENE (sur.)	%	94	89	102	104	N/A	6091836
D4-1,2-DICHLOROETHANE (sur.)	%	120	112	114	116	N/A	6091836

N/A = Not Applicable RDL = Reportable Detection Limit



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

VOLATILE ORGANICS BY GC-MS (WATER)

				SAMPLE 1 (SS1)	SAMPLE 2 (SS2)		
	UNITS	W-1	W-3	SEEP	SEEP	RDL	QC Batch
COC Number		A154887	A154888	A154888	A154888		
		13:30	14:00	10:10	10:20		
Sampling Date		2012/08/12	2012/08/12	2012/08/12	2012/08/12		
Maxxam ID		EE8767	EE8768	EE8778	EE8779		

Volatiles							
Benzene	mg/L	0.091	<0.00040	<0.00040	<0.00040	0.00040	6091836
Toluene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	0.00040	6091836
Ethylbenzene	mg/L	0.0075	<0.00040	<0.00040	<0.00040	0.00040	6091836
o-Xylene	mg/L	0.012	<0.00040	<0.00040	<0.00040	0.00040	6091836
m & p-Xylene	mg/L	0.021	<0.00080	<0.00080	<0.00080	0.00080	6091836
Xylenes (Total)	mg/L	0.034	<0.00080	<0.00080	<0.00080	0.00080	6091836
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	6091836
(C6-C10)	mg/L	0.12	<0.10	<0.10	<0.10	0.10	6091836
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	94	96	102	108	N/A	6091836
4-BROMOFLUOROBENZENE (sur.)	%	82	94	99	89	N/A	6091836
D4-1,2-DICHLOROETHANE (sur.)	%	107	116	112	124	N/A	6091836

N/A = Not Applicable



EBA ENGINEERING CONSULTANTS LTD.

Client Project #: E14101223 Site Location: HOPE BAY, NT

Sampler Initials: MH

General Comments

Sample EE8763-01: Cation anion balance investigated, data quality confirmed.

Results relate only to the items tested.



Attention: MICHEL HEBERT Client Project #: E14101223

P.O. #:

Site Location: HOPE BAY, NT

Quality Assurance Report Maxxam Job Number: CB272000

QA/QC			Date				
Batch			Analyzed				
Num Init	QC Type	Parameter	yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
6086248 MAP	Matrix Spike	Dissolved Calcium (Ca)	2012/08/21		99	%	80 - 120
		Dissolved Iron (Fe)	2012/08/21		96	%	80 - 120
		Dissolved Magnesium (Mg)	2012/08/21		92	%	80 - 120
		Dissolved Manganese (Mn)	2012/08/21		93	%	80 - 120
		Dissolved Potassium (K)	2012/08/21		92	%	80 - 120
		Dissolved Sodium (Na)	2012/08/21		90	%	80 - 120
	Spiked Blank	Dissolved Calcium (Ca)	2012/08/21		104	%	80 - 120
		Dissolved Iron (Fe)	2012/08/21		101	%	80 - 120
		Dissolved Magnesium (Mg)	2012/08/21		97	%	80 - 120
		Dissolved Manganese (Mn)	2012/08/21		97	%	80 - 120
		Dissolved Potassium (K)	2012/08/21		97	%	80 - 120
		Dissolved Sodium (Na)	2012/08/21		94	%	80 - 120
	Method Blank	Dissolved Calcium (Ca)	2012/08/21	< 0.30		mg/L	
		Dissolved Iron (Fe)	2012/08/21	< 0.060		mg/L	
		Dissolved Magnesium (Mg)	2012/08/21	< 0.20		mg/L	
		Dissolved Manganese (Mn)	2012/08/21	< 0.0040		mg/L	
		Dissolved Potassium (K)	2012/08/21	< 0.30		mg/L	
		Dissolved Sodium (Na)	2012/08/21	< 0.50		mg/L	
6087215 JLD	Spiked Blank	Alkalinity (Total as CaCO3)	2012/08/16		98	%	80 - 120
	Method Blank	Alkalinity (PP as CaCO3)	2012/08/16	< 0.50		mg/L	
		Alkalinity (Total as CaCO3)	2012/08/16	< 0.50		mg/L	
		Bicarbonate (HCO3)	2012/08/16	< 0.50		mg/L	
		Carbonate (CO3)	2012/08/16	< 0.50		mg/L	
		Hydroxide (OH)	2012/08/16	< 0.50		mg/L	
	RPD	Alkalinity (PP as CaCO3)	2012/08/16	9.2		%	20
		Alkalinity (Total as CaCO3)	2012/08/16	0.8		%	20
		Bicarbonate (HCO3)	2012/08/16	0.3		%	20
		Carbonate (CO3)	2012/08/16	9.2		%	20
		Hydroxide (OH)	2012/08/16	NC		%	20
6087222 JLD	Spiked Blank	Conductivity	2012/08/16		101	%	90 - 110
	Method Blank	Conductivity	2012/08/16	<1.0		uS/cm	
	RPD	Conductivity	2012/08/16	0		%	20
6087225 JLD	Spiked Blank	pH	2012/08/16	-	100	%	97 - 102
	RPD	pH	2012/08/16	0.8		%	5
6090795 LQ	Matrix Spike	O-TERPHENYL (sur.)	2012/08/20		98	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/08/20		103	%	50 - 130
	Spiked Blank	O-TERPHENYL (sur.)	2012/08/20		110	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/08/20		112	%	70 - 130
	Method Blank	O-TERPHENYL (sur.)	2012/08/20		109	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2012/08/20	< 0.10		mg/L	
6090864 KSA	Method Blank	Moisture	2012/08/17	< 0.30		%	
	RPD [EE8494-01]	Moisture	2012/08/17	5.0		%	20
6090874 KSA	Method Blank	Moisture	2012/08/17	< 0.30		%	
	RPD [EE8580-01]	Moisture	2012/08/17	7.9		%	20
6091444 KSA	Method Blank	Moisture	2012/08/17	<0.30		%	
200	RPD [EE8773-01]	Moisture	2012/08/17	10.8		%	20
6091836 WZ0	Matrix Spike	1,4-Difluorobenzene (sur.)	2012/08/18	10.0	104	%	70 - 130
	manix opino	4-BROMOFLUOROBENZENE (sur.)	2012/08/18		107	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2012/08/18		111	%	70 - 130
		Benzene (3ul.)	2012/08/18		107	%	70 - 130
		Toluene	2012/08/18		107	%	70 - 130
		Ethylbenzene	2012/08/18		111	%	70 - 130
		o-Xylene	2012/08/18		112	%	70 - 130
		m & p-Xylene	2012/08/18		114	%	70 - 130
		(C6-C10)	2012/08/18		96	%	70 - 130
		(55 510)	2012/00/10		55	,0	. 0 100



Attention: MICHEL HEBERT Client Project #: E14101223

P.O. #:

Site Location: HOPE BAY, NT

Quality Assurance Report (Continued)

Maxxam Job Number: CB272000

QA/QC			Date				
Batch		_	Analyzed		_		0011
Num Init	QC Type	Parameter	yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
6091836 WZ0	Spiked Blank	1,4-Difluorobenzene (sur.)	2012/08/18		85	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2012/08/18		84	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2012/08/18		92	%	70 - 130
		Benzene	2012/08/18		95	%	70 - 130
		Toluene	2012/08/18		92	%	70 - 130
		Ethylbenzene	2012/08/18		96	%	70 - 130
		o-Xylene	2012/08/18		97	%	70 - 130
		m & p-Xylene	2012/08/18		101	%	70 - 130
		(C6-C10)	2012/08/18		84	%	70 - 130
	Method Blank	1,4-Difluorobenzene (sur.)	2012/08/17		95	%	70 - 130
		4-BROMOFLUOROBENZENE (sur.)	2012/08/17		89	%	70 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2012/08/17		105	%	70 - 130
		Benzene	2012/08/17	< 0.00040		mg/L	
		Toluene	2012/08/17	< 0.00040		mg/L	
		Ethylbenzene	2012/08/17	< 0.00040		mg/L	
		o-Xylene	2012/08/17	< 0.00040		mg/L	
		m & p-Xylene	2012/08/17	<0.00080		mg/L	
		Xylenes (Total)	2012/08/17	<0.00080		mg/L	
		F1 (C6-C10) - BTEX	2012/08/17	<0.10		mg/L	
		(C6-C10)	2012/08/17	<0.10		mg/L	
	RPD	Benzene	2012/08/17	NC		%	40
	I I D	Toluene	2012/08/17	3.5		%	40
		Ethylbenzene	2012/08/17	NC		%	40
		o-Xylene	2012/08/17	NC		%	40
		m & p-Xylene	2012/08/17	NC		%	40
		Xylenes (Total)	2012/08/17	NC		%	40
		F1 (C6-C10) - BTEX	2012/08/17	NC NC		% %	40
		,		NC NC		%	_
60040E6 DV6	Matrix Chiles	(C6-C10)	2012/08/17	NC	100	% %	40
6094856 RK6	Matrix Spike	Dissolved Chloride (CI)	2012/08/18		100		80 - 120
	Spiked Blank	Dissolved Chloride (CI)	2012/08/18	4.0	99	%	80 - 120
	Method Blank	Dissolved Chloride (CI)	2012/08/18	<1.0		mg/L	00
0004057 DV0	RPD	Dissolved Chloride (CI)	2012/08/18	NC	NO	%	20
6094857 RK6	Matrix Spike	Dissolved Sulphate (SO4)	2012/08/18		NC	%	80 - 120
	Spiked Blank	Dissolved Sulphate (SO4)	2012/08/18		99	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2012/08/18	<1.0		mg/L	
-	RPD	Dissolved Sulphate (SO4)	2012/08/18	7.0		%	20
6097798 APW	Matrix Spike						
	[EE8758-01]	Dissolved Nitrite (N)	2012/08/21		110	%	80 - 120
		Dissolved Nitrate (N)	2012/08/21		98	%	80 - 120
	Spiked Blank	Dissolved Nitrite (N)	2012/08/20		106	%	90 - 110
		Dissolved Nitrate (N)	2012/08/20		102	%	90 - 110
	Method Blank	Dissolved Nitrite (N)	2012/08/20	< 0.0030		mg/L	
		Dissolved Nitrate (N)	2012/08/20	< 0.0030		mg/L	
	RPD [EE8758-01]	Dissolved Nitrite (N)	2012/08/21	NC		%	20
		Dissolved Nitrate (N)	2012/08/21	9.0		%	20
6098991 MJ0	Matrix Spike	•					
	[EE8483-01]	1,4-Difluorobenzene (sur.)	2012/08/23		110	%	60 - 140
	-	4-BROMOFLUOROBENZENE (sur.)	2012/08/23		107	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2012/08/23		105	%	60 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2012/08/23		90	%	60 - 140
		Benzene	2012/08/23		86	%	60 - 140
		Toluene	2012/08/23		94	%	60 - 140
		Ethylbenzene	2012/08/23		99	%	60 - 140
		m & p-Xylene	2012/08/23		107	%	60 - 140
		o-Xylene	2012/08/23		107	% %	60 - 140
		O Aylono	2012/00/23		100	/0	00 - 140



Attention: MICHEL HEBERT Client Project #: E14101223

P.O. #:

Site Location: HOPE BAY, NT

Quality Assurance Report (Continued)

Maxxam Job Number: CB272000

QA/QC			Date				
Batch			Analyzed				
Num Init	QC Type	Parameter	yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
6098991 MJ0	Matrix Spike						
	[EE8483-01]	(C6-C10)	2012/08/23		86	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene (sur.)	2012/08/23		110	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2012/08/23		108	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2012/08/23		109	%	60 - 130
		D4-1,2-DICHLOROETHANÉ (sur.)	2012/08/23		93	%	60 - 140
		Benzene	2012/08/23		84	%	60 - 140
		Toluene	2012/08/23		89	%	60 - 140
		Ethylbenzene	2012/08/23		97	%	60 - 140
		m & p-Xylene	2012/08/23		100	%	60 - 140
		o-Xylene	2012/08/23		94	%	60 - 140
		(C6-C10)	2012/08/23		97	%	60 - 140
	Method Blank	1,4-Difluorobenzene (sur.)	2012/08/23		101	%	60 - 140
	Wictioa Blank	4-BROMOFLUOROBENZENE (sur.)	2012/08/23		98	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2012/08/23		103	%	60 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2012/08/23		86	%	60 - 140
		Benzene	2012/08/23	< 0.0050	00	mg/kg	00 - 140
		Toluene	2012/08/23	<0.000		mg/kg	
		Ethylbenzene	2012/08/23	<0.010		mg/kg	
		Xylenes (Total)	2012/08/23	<0.040		mg/kg	
		m & p-Xylene	2012/08/23	<0.040		mg/kg	
		o-Xylene	2012/08/23	< 0.020		mg/kg	
		F1 (C6-C10) - BTEX	2012/08/23	<12		mg/kg	
	DDD [EE0400 04]	(C6-C10)	2012/08/23	<12		mg/kg	50
	RPD [EE8483-01]	Benzene	2012/08/23	NC		%	50
		Toluene	2012/08/23	NC		%	50
		Ethylbenzene	2012/08/23	NC		%	50
		Xylenes (Total)	2012/08/23	NC		%	50
		m & p-Xylene	2012/08/23	NC		%	50
		o-Xylene	2012/08/23	NC		%	50
		F1 (C6-C10) - BTEX	2012/08/23	NC		%	50
		(C6-C10)	2012/08/23	NC		%	50
6098994 RSU	Matrix Spike						
	[EE8770-01]	1,4-Difluorobenzene (sur.)	2012/08/23		102	%	60 - 140
		4-BROMOFLUOROBENZENE (sur.)	2012/08/23		99	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2012/08/23		91	%	60 - 130
		D4-1,2-DICHLOROETHANE (sur.)	2012/08/23		103	%	60 - 140
		Benzene	2012/08/23		89	%	60 - 140
		Toluene	2012/08/23		91	%	60 - 140
		Ethylbenzene	2012/08/23		85	%	60 - 140
		m & p-Xylene	2012/08/23		79	%	60 - 140
		o-Xylene	2012/08/23		87	%	60 - 140
		(C6-C10)	2012/08/23		115	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene (sur.)	2012/08/23		101	%	60 - 140
	•	4-BROMOFLUOROBENZENE (sur.)	2012/08/23		101	%	60 - 140
		D10-ETHYLBENZENE (sur.)	2012/08/23		106	%	60 - 130
		D4-1,2-DICHLOROETHANÉ (sur.)	2012/08/23		111	%	60 - 140
		Benzene	2012/08/23		103	%	60 - 140
		Toluene	2012/08/23		100	%	60 - 140
		Ethylbenzene	2012/08/23		105	%	60 - 140
		m & p-Xylene	2012/08/23		98	%	60 - 140
		o-Xylene	2012/08/23		97	%	60 - 140
		(C6-C10)	2012/08/23		76	%	60 - 140
	Method Blank	1,4-Difluorobenzene (sur.)	2012/08/23		99	%	60 - 140
Ì	MOTIOG BIGIN	4-BROMOFLUOROBENZENE (sur.)	2012/08/23		96	%	60 - 140
			20.2/00/20			, ,	33 110



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Quality Assurance Report (Continued)

Maxxam Job Number: CB272000

QA/QC			Date				
Batch			Analyzed				
Num Init	QC Type	Parameter	yyyy/mm/dd	Value	Recovery	UNITS	QC Limit
6098994 RSU	Method Blank	D10-ETHYLBENZENE (sur.)	2012/08/23		93	%	60 - 13
		D4-1,2-DICHLOROETHANE (sur.)	2012/08/23		101	%	60 - 14
		Benzene	2012/08/23	< 0.0050		mg/kg	
		Toluene	2012/08/23	< 0.020		mg/kg	
		Ethylbenzene	2012/08/23	< 0.010		mg/kg	
		Xylenes (Total)	2012/08/23	< 0.040		mg/kg	
		m & p-Xylene	2012/08/23	< 0.040		mg/kg	
		o-Xylene	2012/08/23	< 0.020		mg/kg	
		F1 (C6-C10) - BTEX	2012/08/23	<12		mg/kg	
		(C6-C10)	2012/08/23	<12		mg/kg	
	RPD [EE8770-01]	Benzene	2012/08/23	NC		%	ţ
		Toluene	2012/08/23	NC		%	5
		Ethylbenzene	2012/08/23	NC		%	Ę
		Xylenes (Total)	2012/08/23	NC		%	Ę
		m & p-Xylene	2012/08/23	NC		%	Į
		o-Xvlene	2012/08/23	NC		%	Ę
		F1 (C6-C10) - BTEX	2012/08/23	NC		%	Ę
		(C6-C10)	2012/08/23	NC		%	
3100111 LQ	Matrix Spike	(,					
	[EE8771-01]	O-TERPHENYL (sur.)	2012/08/21		93	%	50 - 13
	[=====	F2 (C10-C16 Hydrocarbons)	2012/08/21		93	%	50 - 1
		F3 (C16-C34 Hydrocarbons)	2012/08/21		98	%	50 - 1
		F4 (C34-C50 Hydrocarbons)	2012/08/21		96	%	50 - 13
	Spiked Blank	O-TERPHENYL (sur.)	2012/08/21		82	%	50 - 13
	Opinou Biarin	F2 (C10-C16 Hydrocarbons)	2012/08/21		91	%	70 - 13
		F3 (C16-C34 Hydrocarbons)	2012/08/21		98	%	70 - 13
		F4 (C34-C50 Hydrocarbons)	2012/08/21		99	%	70 - 13
	Method Blank	O-TERPHENYL (sur.)	2012/08/21		92	%	50 - 13
	Wethou Blank	F2 (C10-C16 Hydrocarbons)	2012/08/21	<10	32	mg/kg	00 10
		F3 (C16-C34 Hydrocarbons)	2012/08/21	<10		mg/kg	
		F4 (C34-C50 Hydrocarbons)	2012/08/21	<10		mg/kg	
	RPD [EE8771-01]	F2 (C10-C16 Hydrocarbons)	2012/08/21	NC		//////////////////////////////////////	į
	IN D [LLOTT 1-01]	F3 (C16-C34 Hydrocarbons)	2012/08/21	36.5		%	į
		F4 (C34-C50 Hydrocarbons)	2012/08/21	NC		%	į
6108077 LQ	Spiked Blank	O-TERPHENYL (sur.)	2012/08/22	140	88	%	50 - 13
JIOOOTT LQ	орікса Біалік	F2 (C10-C16 Hydrocarbons)	2012/08/22		98	%	70 - 13
		F3 (C16-C34 Hydrocarbons)	2012/08/22		98	%	70 - 13
		F4 (C34-C50 Hydrocarbons)	2012/08/22		94	%	70 - 13
	Method Blank	O-TERPHENYL (sur.)	2012/08/22		94	%	50 - 13
	METHOU DIATIK	F2 (C10-C16 Hydrocarbons)	2012/08/22	<10	94	mg/kg	30 - 1
		F3 (C16-C34 Hydrocarbons)	2012/08/22	<10		mg/kg	
		F4 (C34-C50 Hydrocarbons)	2012/08/22			0 0	
2116600 VII	OC Standard	,		<10	100	mg/kg %	07 4
3116609 YU	QC Standard	Sieve - Pan	2012/08/30		100 99	% %	97 - 10
	DDD	Sieve - #200 (>0.075mm)	2012/08/30	20.2	99		92 - 10
	RPD	Sieve - Pan	2012/08/30	22.3		%	3
		Sieve - #200 (>0.075mm)	2012/08/30	10.7		%	

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



Attention: MICHEL HEBERT Client Project #: E14101223

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Site Location: HOPE BAY, NT

Quality Assurance Report (Continued)

Maxxam Job Number: CB272000

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

Maxxam

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Site Location	HOPE Bay, NT				ds ət		(AT1)					□VOCs □BTEX FI:F4 □ Turb □ F DOC	Regulated Metals (ccmE/Atr)	Total ⊡ Dissolve					1	
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	Sample ID	Depth	Matrix GW / SW	Date/Time	Sampled	BTEX	Requiated	Salinity	Assessment ICP Metals	Basic		□BIEX F1. □VOCS. □BIEX F1-F2 □BIEX F1. □ Routine Water □ Turb □ □ TOC □ DOC	Total Dissolved	Mercury					HOLD - Do not Analyze	# of Containers Submitted
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Invoice To: C/	O Report Address	Report To:	Same as Invoice	Report Distribution (E-Mail):	Page:	
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* APECI-5	0.75+0 Si			and the state of t	ARRIVED AT DEL	POT: 6
9 APECI-6	0.25 to 500					6
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11 Incide Land Garan 3	0.3 to 50	1 12/08/11 10:40	100	Fig. 1. St. 1. St. 2. St. 1. St. 2. St. 1. St. 2. S	WAR TO F	1 6
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Sampled By: MH /TH		****		or pac		H	Regulated Metals (CCME / AT1)		Assessment ICP Metals Basic Class II Landfill		SOON	□BTEX F1-F4	□ dunt □	DOC	Regulated Metals	ទី	Total □ Dissolvec				1			50	Do not Analyze	omit
SERVICE RUSH (Con	tact lab to rese	erve)		erse t		٤l	sls (:	CP Meta				'n		Rec	Į.	Total			li				6	Ana	Sut
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REGULAR (5	to / Days)			ις.	F1-F4	75 1	g .	4	lass		E	E	e e			8									Po	ıtair
	Depth	Matrix	Date/Time S		×	()	ria;		Assessment Basic Class		mag (EX	DBTEX F1-F2	W Routine	၁၀	<u>_</u>	No.	5									Š
Sample ID	(unit)	3W / SW Soll	YY/MM/DD	24:00	BTEX	Sie	Reg	Sallnity 4	ASS Bas		18	8	7		Total	Dissolved	Mercury								HOLD	# of Containers Submitted
1 W-3		<i>em</i>	12/08/12	14:00			12			8	X		×	- 16 - 16 - 16			1.000 m 1.76 m 1.00 m									3
2 AEC1-13	0.5 to 0.75m	انع	2/08/17	14:30				2 11	3		2 12-	15 Her	25.00		25 T	i i i i i i i i i i i i i i i i i i i		1 1		1	1			,		2
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5 AECI-16	2.2m			14:40	ŀ	T			8			100	11177	900	110	9							1		abla	2
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8 AEC1-19	0.25 to	Soil	12/00/11	2	11		-					3,29	12 (2)	9197 2019 1019	i i i i Lineta	and the	7.1		h in	100	201	2				2
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11 See Sample (SSI)		SW	12/08/12	10:10				Ī								eren er en				0						3
12 Seep Sample 2 (552)	-			10300			8	324			80 m / C Wa - 18 - 18 W	100 104	1	75 - 14 - 14 - 14 - 14 - 14 - 14 - 14 - 1	9.7		999), 51 Y									3
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	SERVICE REQUESTED: RUSH (Con Data Required:		eserve)	See remea for package a pacific	F1-F4	(75 micron)	Regulated Metals (CCME / AT1)	4	Assessment ICP Metals	Class II Landfill		F) DVOCe	i.	C Boutine Water D To	-000 D			/ D Total D									Do not Analyze	# of Containers Submitted
	Sample ID	Depth (unit)	Matrix GW / SV Soil	Date/Time Sampled YY/MM/DD 24:00	7.	Sleve (7	Regulat	Sallnity	Assess	Basic C		DETEXE	CENTER FIFE	D Bout	E TOC	Total	Dissolved	Mercury									HOLD -	# of Co
1	AECZ-3	1.25%	50:(12/08/11 8:90	X									111	1	111												2
2	AEC2-4	0.5 to	50:1	W/88/1 9:00	X				18			1	1		217	111	{ 14 }											2
3	AGC2-5	0.75to	551	12/08/11 9:10	X											5												2
4	AEC2-6	0.754s	Soil	12/08/11 9:20	X							110															1	2
5	AECA-7	0.75 to	50:1	12/08/11 9:30	X							1 1 1						140										2
6	AECZ-8	0.75 to	50:1	13/08/N 9:40											134			17							40	m	7	a
7	AEC3-1	D.有心/m	Soil	1286/11 12:00	1												1,	- 11				П			VP.	7	1	2
8	AEC3-2	0,25 40		12/08/11 12:24						n.		71		W	Hi.	15					9 17	DE	TO		17	10	X:	2
9	A6C3-3	0.95 to 0.5m		D/08/11 12:90	7					180	- N	Ti	1	ill		1		10		1 1		C12.742.00			1	П	1	2
10	AEC3-4	135m	Soil	12/08/11 (2:40		П						1					1.		1	411	13	2014			1		X	2
11	A6C3-3 A6C3-4 A6C3-5	0.75%		2/08/11 /25/90								10			1	7	179			NO	1	2,0	1	\top	+	H		2
12	AECG-1	0.50	50:1	12/00/1 9:50	1	П						1				C.		11	7	EMI	10	74	-		1		X	2
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N/1 2 1/2 2 200			777, Fax: (403) 735-2240, Toll free: (800) 386-72 7100: Fax: (760) 450-4187: Toll free: (877) 465-		Chain of Custo	dy		
Maxxam		samana viica.com	TOO PER (PER) HOW TOP OF HOW (UT) HOW	****		Page: 3	of	5
Company: Invoice To; C/O Report Ad	<u>.</u>	Report To:	Samo as bivoice	Report Distribution (E-Mail):		REGULATO	RY GUIDEL	LINES:
Contact: (ac Pa	ge }	Same	as	(. mae as		CCME		
Contact: Address: Por: Por: Por: Por: Por: Por: Por: Por	, ,	Page	1 PC:	Same as		Other:	ited Drinking	
Contact #s: Ph: Colt		Ph.	Celt	10		5	pec. G	۴_
All samples are held for 60 calendar days after sample receipt, unless spor	fied otherwise		SOIL	WATER	Other A	nalysis		7
Project #/ Name: [14/0/223		apaciffes	E	DVOCs DBTEX F1-F4 etTurbF DOC: case Arry TotalDlsspivec				
Site Location: Hope Bay, NI		fr align	×	WOCs BTEX F1:8 Turb Furb DC: Luated Met				to de
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1 ACC6-2 1.	200	12/00/11 10:00 X						12
2 AEC6-3 0.7	to Soil	108/11 10HO						Xa
3 AECG-4 0.75	60 C'	13/08/11 10:20 X						2
4 40001 1 0.25		DAMIN Nigo X						2
10000 0 025	in Soil	12/08/11 11:10					m	x 2
6 APECI-3 036	0 0.1	12/08/11 11:20 X				119	1	12
APEC1-4 051	m Soil	12/08/11 11:30 ×		Territorio de la composición dela composición de la composición de la composición de la composición de la composición dela composición dela composición dela composición de la composición de la composición de la composición de la composición dela composición de la composición dela composición dela composición dela composición dela composición dela composición dela compos		111	411	1)2
8 10011-6	10 6.1	13/08/11 H:40			A STORETON AND	ormore.	+	x2
· APECI-60 200	0 -01	12/08/11 12:00 X		48 111 11 10 11 12 13 15 1	ARRIVED AL	JEPU1:	++	2
10 Inside Land Goran 8.3		13/08/11 1013/0 X		11 11 11 11 11 11 11 11 11 11 11 11 11	A\$3 13 2	012		2
"Inside Land form 3 031	Sil	12/08/11 (0:300 X			1		++-	2
12 Inside Land Farm 5 011	in Soil	12/08711 10/90 X			TEMP: DD		++	2
Please indicate Filtere	-	Lod 60111 In ollin 1		737 11 753 45 45 45 153		+++		5/0
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Mich Meles		12/08/13		ocelved By: Date:	Time; Ma	Octorn Job # 6	32720	00
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Special Instructions:			# of Jars Used & Not Lai	b Coffments: , /		Seal	20: 1 3277733	
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Marva	m	508	0 19st St. NE, T2E 8P8. Ph: 8331 - 48 Street, T6B 2R4. Ph														Ch	ain o	f Cu	stoc	ly					
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Project // Name: FI4101223 Site Location: Hope Buy, A	7		ods at			(CCME / AT1)				111	DRIEX F1-F4	D		Regulated Metals	ATT)	☐ Total ☐ Dissplved										70
Quote #: Sampled By: PH-TH			packag			CME		als	_	DVOCs	TEX	□ Torb	ပ္	latec	CIME /	0									26	21890
Приси	Contact lab to re				•			Met	ll log	9	Ö		Doc □	nge	9	otai									Analyze	Submitted
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REGULA	AR (5 to 7 Days)		Sac	F1-F4	5 ml	8	4	men	Class II Landfill	E.	F	ine l	(1)		. pg					1				1	Do	Containers
Sample ID	Depth	Matrix GW / SV	Date/Time Sampled	BTEXF	Steve (7	Regulated	Sallnity	Assessment ICP Metals	Basic C	BTEX F	EBTEX F1-F2	Routine Water	UTOC.	191	Dissolved	Mercury									HOLD.	
	(unit)	Soli	YY/MMUD 24'00	1	Sie	Re	Sa	As	š	4	Þ	E'	ń	Total	Ö	Me	-		1	_	_		-	+	일	\$ 0
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APECS-2	050	500	DIONA 13:10					4	444	1	41	17		iii					1						-	8
· APECS-3	0.2510		12/08/11 13:20	×			_	4		1	1		1	14												2
Gw-1 Boston		GW	以紛風 950							St.	X	×	1			10								بما	n.	3
5 Gw-2 Boston	-	GW	12/16/10 9:15							*	X	X.											X	1	10	1
6 GW-3 Boston	_	GW	12/05/12 9:30							师	X	×				1							1	1	MX	2
16W-4 Boston		GW	12/08/10-9:45							湿	X	×		1	733										1	1
8 GW-5 Boston	_	GW	W/04/10_ 10-00							*	X	X		133					ADR	EVE	DA	TD	EPO	C:		245
9 PW-1	_ ^	GW	126812 Ileo		. 1					18k	X	×							XIU.			no	47			2
10 PW-2	_	GW	11:20		1.00					畿	X	×			- 1					Ub	1:	-	مُر.			3
11 PW-5		SW	1266/12 11:40							銮	X	X							-	100	K	A	K		Т	3
12 W-1	7	ew	12/06/12 13:30	,						您	1	x							11	MP	U		7	T	T	3
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Special Instructions:

of Jars Used & Not Submitted

Chain of Custody

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Company:	/O Report Address		Report	Report To:				Same as Invoice					Report Distribution (E-Mail):											REGULATORY GUIDELINES:				
Company,											Sawe as Page I											AT1						
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Contact #s: Ph	Cel:		Ph:		-	-	u	Cel	t							-						5	;te	SR	cit	ic		
All samples are held for 60 calender days after sample reo	elot, unless specified oth	erwise.		1				SO	IL.				V	VATI	B	_	Т			Ot	her A					T	T	
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Sample ID	(unit)	GW / SV Soll	YY/MM/DD	24:00	BTEX	Sle	Neg S	Ass	Bas		潛	100	個	E.Toc	Total7	Dissolved	Mercury								0	HOLD - Do not Analyze	# of Containers Submitted	
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Maxxam Analytics International Corporation o/a Maxxam Analytics

APPENDIX C EBA'S GENERAL CONDITIONS



GENERAL CONDITIONS

GEO-ENVIRONMENTAL REPORT

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's Client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

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2.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

3.0 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.

4.0 INFORMATION PROVIDED TO EBA BY OTHERS

During the performance of the work and the preparation of the report, EBA may rely on information provided by persons other than the Client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.