GOVERNMENT OF YUKON
DEPARTMENT OF COMMUNITY SERVICES

HYDROGEOLOGICAL ASSESSMENT
DEEP CREEK WASTE DISPOSAL FACILITY

REPORT

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ISSUED FOR USE
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EXECUTIVE SUMMARY

The Government of Yukon (Department of Community Services) engaged EBA Engineering Consultants Ltd. to install a groundwater monitoring well network, undertake a groundwater monitoring event and prepare a hydrogeological assessment of the Deep Creek Waste Disposal Facility.

EBA directed and supervised the drilling and installation of three monitoring wells in September 2010 and undertook a groundwater monitoring event in November 2010. This report has been prepared in accordance with the agreed scope of work and present conclusions and recommendations based on the hydrogeological conditions encountered during the fall 2010 field works.

The following conclusions are made based on the findings of the hydrogeological assessment:

- Three monitoring wells DC-MW01, DC-MW02 and DC-MW03 were installed in September 2010 in areas north and south of the waste disposal facility to establish a groundwater monitoring network at the Site. All monitoring wells were completed in till with a slotted section at the well bottom to allow groundwater entry;
- Based on groundwater elevation data, monitoring wells DC-MW02 and DC-MW03 appear to be down-gradient of the Site and DC-MW01 up-gradient; however, additional groundwater elevation data are necessary to identify potential seasonal changes and confirm the conceptual hydrogeological model;
- No monitoring or sampling of groundwater is believed to have been conducted at the Site prior to the fall 2010 field program;
- The conceptual hydrogeological model indicates that there is a degree of recharge to the Silt Till Aquifer from the Bedrock Aquifer. Groundwater flow downgradient of the site is expected to be predominately to the southeast towards Deep Creek where groundwater would be expected to discharge, although this cannot be confirmed without the installation of additional wells;
- Analysis of the rising head hydraulic response test results show that the geometric mean of the hydraulic conductivity of the till is about 4×10^{-6} m/s and the estimated average linear groundwater velocity is 0.6 m/year.
- Concentrations of sulphate at monitoring wells DC-MW01 and DC-MW03 exceed the CSR-Aquatic Water criteria;
- Concentrations of magnesium and manganese at monitoring wells DC-MW01, DC-MW02 and DC-MW03 exceed the CSR-Drinking Water (aesthetic) criteria;
- The concentration of iron at monitoring well DC-MW03 exceeds the CSR-Drinking Water (aesthetic) standard;
- The concentrations of uranium at monitoring well DC-MW01 exceeds the CSR-Drinking Water standard;
- All other analytes were below the applicable guideline criteria;
- Extractable petroleum hydrocarbon concentrations (LEPHw and HEPH) in all monitoring wells were below the laboratory Method Detection Limit (MDL) of 0.1 mg/L with the exception of the LEPHw

concentration at the MDL detected in DC-MW01. This detection was below the applicable guideline value for Aquatic Water of 0.5 mg/L;

- PAH and VOC concentrations were below the laboratory MDLs in all wells other than for detectable concentrations of xylenes at DC-MW01. The detectable concentration of Total Xylene was below the applicable guideline value for the CSR-Drinking Water guideline;
- Ammonia, an indicator of landfill leachate contamination, was detected in all monitoring wells. The concentration at the inferred upgradient monitoring well DC-MW01 were four times higher than that reported at downgradient well DC-MW02 and six times higher than downgradient well DC-MW03.
- A review of groundwater monitoring results indicates groundwater at monitoring wells DC-MW01 and DC-MW03 has potentially been impacted by contaminants sourced from landfilling operations. DC-MW02 has also potentially been impacted, although if impacted, to a significantly lesser extent than the other two wells.
- To more definitively assess impact on groundwater quality from the landfill and confirm the conceptual hydrogeological model, additional monitoring wells may be required to be installed to assess groundwater quality.

The following recommendations are made based on the findings of this 2010 Hydrogeological Assessment report:

- As required by the Site's Waste Disposal Facility Permit, future monitoring programs should be completed once during the spring freshet when the most significant groundwater recharge occurs and once in late summer;
- A site inspection be undertaken by a qualified hydrogeologist prior to the next sample round to identify a suitable location to obtain up and down gradient samples from Deep Creek;
- DC-MW01, DC-MW02 and DC-MW03 should be surveyed by a professional surveyor for location and elevation prior to the next monitoring round. Elevations from the top of the PVC casing and from ground level immediately adjacent to the well should be reported;
- Following the survey of the monitoring wells and the next round of sampling in 2011, data should be reviewed by a qualified hydrogeologist and the need for additional up-gradient and downgradient monitoring wells assessed;

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1.0 INTRODUCTION

1.1 BACKGROUND

EBA Engineering Consultants Ltd., A Tetra Tech Company (EBA) have been retained by the Government of Yukon (YTG), Department of Community Services, to design and install a groundwater monitoring network, undertake a groundwater monitoring event and prepare a Hydrogeological Assessment Report at the Deep Creek Waste Disposal Facility (the "Site").

These works have been performed in accordance with the approved scope of work detailed in EBA's proposal (Doc. Ref. PW23101317) dated February 2010, accepted by YTG on May 8, 2010 and additional works detailed in EBA's Technical Memo dated April 29, 2010 accepted by YTG on June 21, 2010.

1.2 PURPOSE AND OBJECTIVES

The purpose of this study is to assess the impact of waste disposal at the Site upon local groundwater quality.

The specific objectives of this study were to:

- Design and install a monitoring well network sufficient to provide an assessment of the Site's impact on groundwater quality;
- Assess groundwater quality against relevant Yukon water quality standards;
- Recommend further works to be completed to more comprehensively assess impact to groundwater quality as appropriate.

1.3 SCOPE AND SEQUENCE OF WORK

The following scope of work was proposed to develop the conceptual hydrogeological model for the site. This work was performed in accordance with the Site's Waste Disposal Facility Permit (Permit No: 80-009, Effective January 1, 2010 to December 31, 2011), relevant Environment Yukon Protocols and in accordance with the Yukon Environmental & Socioeconomic Assessment Act (YESAA) Decision Document issued for the Site (YESAA File Number: 2008-0270). A copy of the current Waste Disposal Facility Permit is provided in Appendix B.

In summary, the proposed scope of work included a desktop study, followed by a field investigation program consisting of the installation of a groundwater monitoring network, water level monitoring, aquifer testing, groundwater sampling and analysis from the monitoring well network, followed by interpretation of results to provide a comprehensive Hydrogeological Assessment Report detailing the impact to groundwater quality and risk to downgradient receptors. This work was undertaken in general conformance with relevant Yukon Contaminated Sites Regulation (YCSR) protocols.

To complete the scope of work, EBA completed the following tasks:

- Background data collation and review;
- Installation of a monitoring well network;
- Development of monitoring wells;
- Sampling and testing of groundwater;
- Aquifer testing (hydraulic conductivity);
- Data review and interpretation of results;
- Reporting.

Table 1-1 summarizes the tasks and sequence of events to arrive at this report.

Table 1-1: Site Assessment and Task Sequence

Date	Activity
8 May 2010	EBA formally appointed by YTG to undertake the work.
29 June 2010	Site inspection by Adam Seeley and Breanne Waggot of EBA
10-12 September 2010	Groundwater monitoring wells installed by Donjeck Drilling under the supervision of EBA
15 November 2010	Groundwater monitoring event and slug testing of monitoring wells undertaken by EBA
12 January 2011	Issued For Review Report_01 Issued to YG
24 February 2011	Issued For Review Report_02 Issued to YG

1.4 QUALIFICATIONS OF ASSESSORS

Mr. Adam Seeley, M.Hyd. conducted the initial site inspection, coordinated and supervised drilling works, and prepared this assessment report. Mr. Seeley is a Hydrogeologist with EBA's Whitehorse Environment Group, with 9 years experience in the environmental and hydrogeological fields and has been involved in groundwater monitoring and reporting programs at over 50 sites in Australia and Yukon, Canada.

Ms Breanne Waggott, B.Sc. conducted a site inspection, supervised drilling works, and assisted in the preparation of this assessment report. Ms. Waggott is a Junior Hydrogeologist with EBA's Whitehorse Environmental Group, with 1 years experience in the environmental hydrogeology field. Throughout her time at EBA she has assisted multiple field and desktop based hydrogeological assessments.

Ms. Tamra Reynolds, M.Sc. reviewed this report. Ms. Reynolds is a Senior Contaminant Hydrogeologist with EBA's Whitehorse Environment Group, with 15 years of experience in the environmental and hydrogeological fields. She has conducted over 100 Environmental Site Assessments, hydrogeological evaluations, and remediations at sites across Canada including Yukon.

1.5 AUTHORIZATION

Written authorization and a signed contract to proceed with the works detailed in EBA's proposal (Doc. Ref. PW23101317) dated February 2010 were received from Bill Brown via email on May 19, 2010.

EBA received verbal authorization from Government of Yukon, Department of Community Services on June 21, 2010 to proceed with the additional assessment work outlined in EBA's Technical Memo dated April 29, 2010. A Change Order signed by both Mr. Marc Perreault, a Director at the Yukon Government, and an EBA representative authorising additional tasks to complete water sampling and hydrogeological assessments at the project site was received by EBA on July 9, 2010.

2.0 SITE DESCRIPTION AND HISTORY

2.1 LOCATION OF STUDY AREA

Deep Creek Waste Disposal Facility (WDF) is located 40 km north of Whitehorse on Deposition #105E03-059, just off the Deep Creek Road at a latitude of 61° 04' 56" N and longitude of 135° 13' 46" W. The Deep Creek community is located approximately 1.5 km to the southeast of the site.

Lake Laberge and Deep Creek are the nearest major water bodies to the site, located 1.2 km east and 0.5 km south of the Deep Creek WDF, respectively. The site location and surrounding features are shown in Figure 1.

The Site is located at an elevation of 695 meters above sea level (masl) on flat terrain. In general, the terrain slopes gently to the south towards Deep Creek and southeast towards Lake Laberge. Photo 1 shows a view of the site with burned waste evident in the foreground and waste oils, white goods, general household items and construction materials in the background.

2.2 SITE HISTORY

The Deep Creek WDF opened in the late 1980's when a community solid waste facility to the southeast was closed and decommissioned. The use of the site prior to waste disposal is unknown. The facility is owned and maintained by the Government of Yukon and used by the surrounding local residents with occasional use by Whitehorse citizens. The site is maintained by a site supervisor, although historically the site was operated by local residents and contractors potentially resulting in the uncontrolled deposition of waste. Access is currently controlled by a locked gate with electrical and wire fences around the operational perimeter.

Photograph 1: Deep Creek Waste Disposal Facility – June 2010 (view west)

Historically, recyclable material was taken to Whitehorse for deposit refund by local residents, whilst domestic waste was placed in excavated trenches and periodically burned, then covered. Construction material and grubbing waste was stockpiled and periodically burned . The site is now classed as a modified transfer station meaning that construction and demolition waste and/or animal carcasses are permanently disposed of on the site with all other material removed from the site for recycling or disposal at an alternative location.

Copies of site plans dated July 2002 and September 2004 were provided to EBA and are also included in the Site's Solid Waste Management Plan (SWMP) (Access, et al, 2003). These plans show the historical extent of domestic garbage burial and the ash disposal trench, both on the southern half of the site.

Waste observed on site during the June 2010 visit included tires, washers, driers, fridges, freezers, car bodies, construction material and grubbing waste, household waste, batteries, fuel drums, waste oil, paint, and above ground storage tanks. Burning of wood and debris appeared to have recently taken place within an open pit on the western site boundary, in contradiction to the current permit requirements. Tires, appliances, metals and hazardous waste appear to still be stored in the locations shown in the 2002 and 2004 site plans. A site plan showing the historical and present locations of buried and stockpiled waste is provided in Figure 2.

The SWMP details the wastes historically received which included: domestic waste and commercial wastes, construction and demolition waste, derelict vehicles, white metal appliances, land clearing and yard waste, grubbing waste, waste oil, batteries, tires, and household hazardous waste.

Waste is currently segregated and stockpiled on site, with chemical waste and recyclables being stored and periodically removed. Putrescible domestic waste, which had previously been burnt and buried at the site,

is now collected at the Deep Creek Transfer Station and transported to Whitehorse Landfill (Peter Zurachenko pers. comm.).

The SWMP details a procedure for the formally routine practice of burning, compaction and covering of waste. The covering of waste was undertaken periodically to limit water infiltration, reduce scatter from animals and wind and to reduce odour. Waste was compacted using tracked machines and covered with 100 mm of fill and clean organic material, clean land clearing material or soils excavated from the disposal trenches. The preferred cover material was native silty sands and clay silts sourced from disposal trenches which are typically low in permeability limiting infiltration of water. There is not believed to be a final lining or capping of these deposition areas with engineered low permeability material.

It is noted that prior to the current managed segregation of waste streams, there is the potential that hazardous items such as batteries, waste oil, and other chemical waste may have been buried with general domestic waste. There is anecdotal evidence of military waste being disposed of at the facility (Jason Doucet pers. comm.).

3.0 METHODOLOGY

3.1 HYDROGEOLOGICAL ASSESSMENT

The hydrogeological assessment methodology involved an assessment of existing information and an inspection of the landfill site and surrounding area on June 29, 2010.

This component included the following tasks:

- Collation of background information;
- Assessment of the available groundwater data, bore logs and related hydrogeological information;
- Development of a Conceptual Hydrogeological Model.

3.1.1 Data Sources

Data used to complete the hydrogeological assessment was obtained from the following sources:

- Site inspections;
- Topographic and Geological maps;
- EBA internal database search and review of past EBA assessment reports and maps;
- Operational permits issued by Environment Yukon for the Deep Creek WDF site;
- Review of the Deep Creek Solid Waste Management Plan (June 2003);
- Environment Canada Climate Normals (1971 – 2000) (http://www.climate.weatheroffice.gc.ca/climate_normals/index_e.html);
- Yukon Water Well Registry, Department of Environment, Government of Yukon (http://www.environmentyukon.gov.yk.ca/pdf/YukonWaterWellsSummary.pdf)

- Contaminated Site Registry records at Yukon Environment; and,
- Interview with Yukon Government - Community Operator Supervisors.

3.1.2 Site inspection

A site inspection was undertaken by EBA personnel on June 29, 2010. The purpose of this visit was to review the site location, layout and types of waste, confirm the expected geology and topography, to note aspects of geological and hydrogeological significance and to ascertain drill rig access for the proposed groundwater monitoring well locations.

3.1.3 Background Geological Information

Geological information was obtained through site visits, review of topographic and geological maps (from the Canadian and Yukon Geological Survey's) and geotechnical reports and maps. Additional subsurface information was gathered through an internal database search of EBA records for boreholes, test pits, monitoring wells, and soil tests completed at or in the vicinity of each site.

3.1.4 Contaminant Sites Registry

Since 2002, when the Contaminated Site Regulation came into effect, Environment Yukon has been maintaining records of documented spills and reported contaminated sites throughout Yukon. This database is known as the Contaminated Site Registry. A request was made to Environment Yukon for a Contaminated Sites Registry search at the Deep Creek Waste Disposal Facility. Environment Yukon reported to EBA that the registry does not contain a record of any documented spills or contaminated sites within the site boundary or nearby vicinity. It is noted that there remains a possibility of unreported or un-assessed contamination sources within the vicinity of the Site. Spills documented prior to 2001 can be found through a request from Access to Information & Protection of Privacy Act (ATIP). Such a search was not within the scope of this project.

3.1.5 Interviews with Waste Disposal Facility Personnel

EBA representatives met with Yukon Government Community Operations Supervisors Mr. Peter Zurachenko and Mr. Jason Doucet on June 23, 2010 to discuss information pertaining to the Deep Creek Waste Disposal Facility. Information obtained from this interview included:

- Brief site history;
- Historical waste deposition inventory and anecdotal information;
- Most up to date site plans;
- Special waste deposition/storage areas.

3.1.6 Review of Waste Disposal Facility Permit and Waste Management Plan

The Site's Waste Disposal Facility Permit (Permit No: 80-009) and Solid Waste Management Plan were reviewed and used in conjunction with relevant background information to assess accepted and potential waste streams, to aid in the assessment of potential contaminant transport mechanisms, to confirm

monitoring requirements and develop a monitoring network in compliance with the permit. A summary of the main requirements of the permit in regards to this hydrogeological assessment are outlined in Table 3-1.

Table 3-1: Summary of Current Permit Groundwater Monitoring Requirements

Site	Waste Disposal Facility Permit No.	Solid Waste Management Plan	Permit Requires Groundwater Monitoring	Permit Specifies Groundwater Analysis List	Monitoring Schedule
Deep Creek Waste Disposal Facility	80-009	Yes (Access, et al, 2003)	Yes	Yes	Twice per year (Spring and late Summer)

3.1.7 Review of Environment Yukon Information

EBA representatives visited the Yukon Department of Environment on June 18, 2010 to conduct a review of information pertaining to the Deep Creek Landfill site. Information provided by Yukon Department of Environment (Matthew Nefstead, Contaminated Sites Analyst) for review included:

- Current waste disposal facility permits (which included accepted waste streams and acceptance of special waste);
- Historical site reports, site plans, site inspection reports;
- Recorded spills on sites or neighboring contaminated sites; and,
- Other miscellaneous information related to each site.

3.1.8 Review of EBA Internal Database

EBA retains a database of previous reports, which was reviewed for information pertaining to the Deep Creek Waste Disposal Facility. Relevant information was used to assess geological and hydrogeological conditions and assist in the determination of potential drill sites.

Borehole logs and geochemical analytical data was reviewed from four water supply wells approximately 10 km to the south at the Ta'an Kwach'an Property installed in similar geological formations to those found at the Site.

3.2 FIELD INVESTIGATIONS

3.2.1 Scope of Field Investigations

The scope of the hydrogeological assessment field investigation was as follows:

- Adam Seeley (EBA) and Breanne Waggot (EBA) conducted an inspection of the Deep Creek Waste Disposal Facility on June 29, 2010;

- Three onsite groundwater wells were drilled by Donjeck Drilling under the supervision of EBA from September 10 to 12, 2010. Wells were developed immediately following the completion of the well installation;
- The three onsite groundwater wells were sampled by EBA on November 15, 2010. The water levels at each location were measured prior to purging and sampling and physiochemical parameters were tested at each monitoring well during sampling. Groundwater samples were sent to analytical laboratories accredited as conforming to ISO/IEC 17025 for analysis;
- Slug tests were conducted on the three monitoring wells on the November 15, 2010 in order to estimate the hydraulic conductivity of the aquifer; and,
- Field and laboratory results were summarized interpreted and are presented in this report.

3.2.2 Groundwater Monitoring Well Network

Three (3) groundwater monitoring wells were proposed to be installed at the Site to assess potential groundwater contamination sourced from the waste disposal facility. DC-MW01 was targeted to characterize up-gradient groundwater conditions while DC-MW02 and DC-MW03 were aimed to assess any impact to the groundwater quality sourced from the landfill. The three monitoring wells were installed in September 2010 under the direction of EBA to establish a groundwater monitoring network.

Locations of the monitoring wells were selected based on aerial photography, review of geological and topographical information, review of site history and a site inspection. A site plan showing the approximate monitoring well locations and key site features is provided in Figure 2. Note that these wells have not been surveyed for location and are only approximate.

The drilling and monitoring well installation was completed by Donjeck Drilling of Whitehorse, Yukon under the direction of EBA on September 10, 11 and 12, 2010. All wells were initially advanced to between 15 m and 18 m using Solid Flight Augers (SFA). Permafrost was not encountered in any borehole during drilling. Due to each borehole collapsing to around 11 m below ground level (bgl) following the withdrawal of the SFA, each borehole was re-drilled with Hollow Flight Augers (HFA) to allow the installation of the PVC monitoring well.

Grab samples of the drill cuttings from the auger flights were collected on regular intervals to log the sediments. The borehole logs indicating observed lithology and monitoring well completion details are included in Appendix C, with a summary of well completion details presented in Table 3-2. Groundwater was encountered in all wells approximately 13 m below grade in a silty clay aquifer. The lithology encountered was similar at all three locations and consistent with the mapped lithological interpretations. Each borehole profile generally consisted of silt with minor layers of fine-grained sand (inferred to be till) to the maximum depth investigated (18.3 m).

Monitoring wells were installed in all three drilled boreholes. Installation details are included on the borehole logs in Appendix C. Typical completion details are:

- All wells were completed in clayey silt;
- All three wells were drilled and screens placed aiming to intersect the water table;

- Monitoring wells were completed with 50 mm Schedule 40 PVC pipes;
- A 3 m long well screen (0.010-slot) was installed with the intent that the observed groundwater table would be approximately 1 m below the top of the well screen;
- A solid un-slotted PVC pipe was installed above the well screen to about 0.9 m above grade;
- A silica sand pack was placed in the annulus between the well screen and the borehole wall. The sand pack was extended from the base of the borehole to about 0.6 m above the well screen;
- Approximately 0.6 m of bentonite was placed in the annulus above the sand pack. The annulus was then filled with cuttings to around 1.0 m bgl.
- A surface seal consisting of 0.6 m of bentonite below 0.4 m of concrete was then installed to bring the borehole to ground level and limit surface water infiltration.
- Each well was capped with a PVC end-cap and the well PVC-standpipe protected and secured with a lockable steel protective casing.
- Each well was developed immediately following installation by removing a minimum of 3 well volumes using a dedicated disposable bailer. Development logs are provided in Appendix D.

Table 3-2: Well Construction Details

Well ID	Drilled Depth (m bg)	Aquifer Unit Monitored	Casing Diameter (mm)	Screened Interval (m bg)	Filter Pack Interval(m bg)
DC-MW01	12.2	Till (Clayey silt with fine sand)	50	9.1 - 12.2	8.5 – 12.2
DC-MW02	14.5	Till (Clayey silt with fine sand, minor gravel)	50	11.5 - 14.5	10.8 – 14.5
DC-MW03	16.1	Till (Clayey silt)	50	11.6 - 16.1	11.0 - 16.1

Following the installation and survey of the three monitoring wells, groundwater flow was determined to be in a generally south to south easterly direction and the requirement to have one upgradient and two downgradient wells was deemed to have been complied with and no further wells were required.

3.2.3 Monitoring Well Surveying

EBA surveyed the vertical elevation of the top of the well PVC standpipe at each of the well locations on September 11, 2010. Elevations were surveyed relative to a local benchmark assigned an elevation of 100 m. The monitoring wells were not surveyed for location, although the location of each well was recorded using a hand held GPS device. As the GPS locations obtained have an error of 10 – 15 m associated with them, it is recommended by EBA that all wells are surveyed for location and elevation by a

professional surveyor prior to the next monitoring round. This will allow the wells to be geo-referenced and more accurate site plans to be prepared aiding future planning and assessment works.

Table 3-3 presents GPS locations, survey data and water level measurements for each monitoring well.

Table 3-3: Well Survey and Water Level Data

Well ID	GPS Location (UTM)[1]	Top of PVC Casing Elevation (m)	Standing Water Level (m b TOC) 11/15/2010	Groundwater Elevation (m) 11/15/2010
DC-MW01	04867611N 6772098E	100.681	8.75	91.93
DC-MW02	0487605N 6771922E	101.344	9.497	91.85
DC-MW-03	0487680N 6771951E	100.177	8.445	91.73

[1]GPS locations may include an error of up to 10 – 15 m

3.2.4 Groundwater Monitoring Event

Groundwater monitoring wells DC-MW01, DC-MW02 and DC-MW03 were sampled by EBA on November 15, 2010 using methods in accordance with Contaminated Sites Regulation Protocol No. 7: Groundwater Monitoring Well Installation and Sampling. Wells were sampled approximately two months after the completion of drilling, installation and development, allowing sufficient recovery of the water levels, and to allow for the groundwater in the monitoring well to reach equilibrium with the aquifer.

Prior to sampling, the standing water level (SWL) was measured in each well, using an electric measuring tape. Each well was purged by removing three well volumes using a dedicated disposal bailer prior to a sample being obtained. During purging, physio-chemical parameters (pH, temperature, EC and DO) were measured and recorded. Groundwater Purge and Sampling Field Sheets are presented in Appendix E.

Each sample bottle was labeled with the location ID, project number and date. Sample containers and appropriate preservatives for each suite of tests were provided by the primary laboratory. Samples for dissolved metals analysis were field filtered using new, clean 0.45 µm filters and preserved with nitric acid. All samples were stored in coolers containing ice-bricks and delivered to the analytical laboratories (Exova and Maxxam) under Chain of Custody and within appropriate holding times. Both laboratories are certified by the Canadian Association for Laboratory Accreditation and are accredited as conforming to ISO/IEC 17025 for analysis.

3.2.5 Rising Head Hydraulic Response Tests

Rising head tests were undertaken at each monitoring well to estimate the hydraulic conductivity of the aquifer at the specific well location. The rising head test was performed by quickly removing 2 liters of water from the well using 50.8 mm diameter dedicated polyethylene bailers. The recovery response in the well was then monitored closely using the water level sounder until the water level had recovered to at

least 80% of its static water level. In addition to the manual data, a Solinst Levelogger® was deployed in the well to automatically record the water level data at one second intervals.

The Levelogger installed in DC-MW03 was damaged and/or faulty and the data recorded during the test could not be downloaded for analysis. The recovery of the well was too quick for the manual data obtained to be meaningfully interpreted. The lithology encountered in all three wells was similar and it is considered that the hydraulic conductivity results calculated from DC-MW01 and DC-MW02 are representative of the local area.

3.3 LABORATORY TESTING

The laboratory testing completed for the submitted groundwater samples collected on November 15, 2010 is summarized in Table 3-4. This analysis list is in compliance with the requirements of the Site's Waste Disposal Facility Permit (Permit No 80-009).

Table 3-4: Laboratory Testing Program – September 2010

Sample ID	Ca, Mg, Na, K, Cl, SO4, NO3, NO2, PO4	Dissolved Metals, Hg, Hardness	Alkalinity, CO3, HCO3, pH, TDS, NH3, DOC	VOCs, COD, TKN, EPHw10-19	VHw6-10, BTEX, PAHs
DC-MW01	✓	✓	✓	✓	✓
DC-MW02	✓	✓	✓	✓	✓
DC-MW03	✓	✓	✓	✓	✓

3.4 QUALITY CONTROL/QUALITY ASSURANCE

This section describes the Quality Assurance (QA) and Quality Control (QC) procedures undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results.

A Relative Percent Difference (RPD) data validation spreadsheet is provided in Table 2. Data validation is summarized in Table 3-5.

Table 3-5: Review of Sample QA/QC

QA/QC Aspect	Evidence and Evaluation
Data Representativeness	
Sample integrity	All samples were received by the laboratory within appropriate holding times
Background Samples	DC-MW01 is considered to be hydraulically up gradient of the Site and the groundwater samples from this location can be considered to be representative of background conditions.

Table 3-5: Review of Sample QA/QC

QA/QC Aspect	Evidence and Evaluation
Field Procedures	Monitoring wells were developed and sampled using dedicated hand bailers. All equipment that was used in multiple wells was decontaminated using a three stage wash procedure (detergent, tap water, distilled water).
Calibration of Field Equipment	Calibration of field equipment was undertaken prior to each day of field work.
Data Precision and Accuracy	
Blind Duplicates	One blind duplicate sample was collected from DC-MW03 during the November 2010 groundwater monitoring event. Of the 40 analyte pairs tested, RPD values could not be calculated for 16 pairs as either one or both values were below the laboratory method detection limit (MDL). Of the remaining analyte pairs tested, 2 analytes (mercury and zinc) exceeded the RPD acceptance criteria of +/-30%. These exceedences are considered to be generally minor and related to the poor reproducibility of the analytical methods at low analyte concentrations. RPD calculations are presented in Table 2.
Split Duplicates	One split duplicate sample was collected from DC-MW03 during the November 2010 groundwater monitoring event and sent to Maxxam Laboratories.
	Of the 43 analytes tested, RPD values could not be calculated for 25 pairs as either one or both values were below the laboratory MDL. Of the remaining analyte pairs tested, 6 analytes (copper, manganese, mercury, molybdenum, uranium, zinc) exceeded the RPD criteria of +/- 30%. These exceedences are considered to be generally minor and related to the poor reproducibility of the analytical methods at low analyte concentrations. RPD calculations are presented in Table 2.
Trip Blanks	One trip blank was collected during the September 2010 groundwater monitoring event and placed on hold at the laboratory. Following the receipt and interpretation of results it was not considered necessary to undertake any analysis on this sample.
Laboratory Internal QA/QC	Laboratory internal QA/QC is detailed within the primary and secondary laboratories reports (Appendix F). Overall, both labs showed acceptable testing frequency and results for method blanks, laboratory duplicates and matrix spikes. Maxxam (secondary laboratory) noted minor exceedences for a spike recovery for lithium and RPD for nitrate. These are considered to be minor QC issues and do not impact the validity of the entire data set.

Table 3-5: Review of Sample QA/QC

QA/QC Aspect	Evidence and Evaluation
Holding Times	Holding times for samples were in conformance with applicable ASTM and laboratory requirements.
Laboratory Detection Limit	Laboratory reports indicate that the method detection limits were lower than the respective assessment criteria.
Completeness of test program	The scope of work undertaken was generally consistent with that required to characterize the site and meet the study objective.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection or analysis process for groundwater and therefore, the data set used as the basis for the groundwater assessment is considered valid and complete.

3.5 Application of Applicable Water Quality Standards

The *Contaminated Sites Regulation (CSR) (Environment Act)* provides standards for the assessment and remediation of contaminated sites in Yukon. The water quality standards applying to the assessment of groundwater contamination in Yukon are those specified in Schedule 3 of the CSR. The four types of water uses outlined in the CSR, the relevant water quality standards and their applicability to the assessment are presented in Table 3-6.

Table 3-6: Applicable Water Quality Standards

Water Use	Applicable Water Quality Standard	Applicable Plume Radius (km)	Applicability to Assessment
Aquatic Life	Schedule 3 – Contaminated Sites Regulation (O.I.C. 2002/171)	1	Applicable
Drinking Water	Schedule 3 – Contaminated Sites Regulation (O.I.C. 2002/171)	1.5	Applicable
Irrigation	Schedule 3 – Contaminated Sites Regulation (O.I.C. 2002/171)	1.5	Not Applicable
Livestock	Schedule 3 – Contaminated Sites Regulation (O.I.C. 2002/171)	1.5	Not Applicable

Figure 5 shows the applicable plume radius for each of the water uses around the site. The following presents an assessment of the applicability of each water use detailed above to this assessment.

Aquatic Life

Potential downgradient Aquatic Life receptors have been identified as Lake Laberge 1.2 km east and Deep Creek roughly 0.5 km to the south of the site. Given the potential for the groundwater to pollute these receiving waters, this water use is considered to be **applicable**.

Drinking Water

A review of the Yukon Water Well Registry by EBA on December 14, 2010 shows eight wells in the Deep Creek / Lake Laberge area that could potentially be used for drinking water. It is noted that this database is not complete and it is likely that there are more wells than that recorded on the registry in the local vicinity. Based on a review of Google Earth images (2004), the nearest domestic developments to the Site are located in the Deep Creek community, which range in distance from 1 km to the east up to around 1.5 km to the south-east of the Site. Since 2004, domestic development may have moved closer to the WDF.

While specific locations are not provided for each well on the database, it is assumed that at least one well is located within the allotted distances for drinking water use (1.5 km), therefore this water use is considered to be **applicable.**

Irrigation

The Yukon Water Well Registry compiled by the Department of the Environment was reviewed by EBA on December 14, 2010. The registry does not list any of the eight wells in the Deep Creek / Lake Laberge area as being for irrigation use. It is noted that this database is not a complete record of all wells drilled and it is possible that there are irrigation wells in the local vicinity not captured on the registry.

Figure 5 shows that there are no areas within 1.5 km of the site identified for irrigation/agricultural use by the Yukon Government Mining and Lands Viewer, which was viewed on 10 February 2011. Therefore, it is considered that there is very little likelihood of this water use being realized downgradient and the water use is considered **not applicable**.

Livestock

The Yukon Water Well Registry compiled by the Department of the Environment was review by EBA on December 14, 2010. The registry does not list any of the eight wells in the Deep Creek / Lake Laberge area as being for Livestock use. It is noted that this database is not a complete record of all wells drilled and it is possible that there are Livestock wells in the local vicinity not captured on the registry.

Figure 7 shows that there are no areas within 1.5 km of the site identified for livestock/agricultural use by the Yukon Government Mining and Lands Viewer, which was viewed on 10 February 2011. Therefore, it is considered that there is very little likelihood of this water use being realized downgradient and the water use is considered **not applicable**.

4.0 CONCEPTUAL HYDROGEOLOGICAL MODEL

4.1 SETTING

The Site is located approximately 40 km north of the downtown Whitehorse, approximately 500 m east of the Klondike Highway. The residential development of Deep Creek is approximately 1.5 km to the south-east of the site. The site is roughly rectangular with a length of approximately 150 m and a width approximately 120 m. A site plan is presented in Figure 2.

On a regional scale, the land generally slopes to the east towards Lake Laberge. The Site is generally flat, with a rise in elevation of several meters from west (693 m asl) to east (698 m asl). Local topographical elevation contours are shown on Figure 1. Immediately to the northwest and east of the Site, the land rises moderately to an elevation of around 720 m asl. Directly to the north of the Site is a valley rising gently to an elevation of around 720 m asl. Immediately to the south of the Site, there is a slight topographical high with terrain gently rising to around 700 m asl. To the southwest the elevation gently slopes towards Deep Creek and to the southeast, the elevation slopes towards Lake Laberge.

All vegetation has been removed from the active disposal, burial and storage areas of the Site. The area surrounding the Site has a medium to heavy cover of native spruce and poplar trees. There has been minimal disturbance of the natural land surface within the site boundary. Other than general flattening and shallow excavations, there has been no works that have dramatically altered the local topography.

4.2 CLIMATE

Climatic data is not recorded in the Deep Creek area. Data from Whitehorse airport (the closest weather station, 40 km south of Deep Creek), indicates 267 mm of annual precipitation with the majority of precipitation falling as rain between May and October. The average annual temperature at the Whitehorse airport is -0.7°C with the warmest average monthly temperature being July (14.1°C), and the coldest month generally being January with an average temperature of -17.7 °C (Environment Canada, Whitehorse Airport 1971 to 2000). From this information it can be concluded that groundwater recharge through surface water infiltration will be highest from May to October.

4.3 GEOLOGY AND HYDROGEOLOGY

4.3.1 Geological Framework

Figure 3 illustrates the regional surface geology (Geological Survey of Canada, 1985). The southern Yukon, including the Deep Creek area, has undergone several episodes of glaciation, the most recent being the Quaternary McConnell glaciation. Figure 3 shows the various glacial features and glacial sediment types that are present in the Deep Creek WDF region.

The surficial materials at the site are primarily of glacial origin consisting predominantly of fine grained morainal till. Surficial sediments surrounding the site vary from morainal tills, glacial fluvial and alluvial morainal deposits.

Underlying the glacial sediments at the site is bedrock described as the Laberge Group, consisting of Jurassic interbedded siltstone, sandstone and mudstone with minor volcanics[1,2]. Sedimentary members of this group were observed in the immediate surroundings of the landfill site outcropping to the west, north and east of the site. Outcrops are of higher elevation (approximately 10 m) than the SWF and are heavily fractured. Heavy fracturing is generally present in the shallow bedrock as a result of frost shattering. Various types of volcanic and sedimentary rocks are mapped around the Deep Creek area. Bedrock to the west of the site consists of Cretaceous volcanic rock with Mesozoic acidic intrusions[1,2].

[1] Canada Department of Mines and Technical Surveys. Geological Survey of Canada. 1957. Geological Map of Yukon Territory.
[2] Natural Resources Canada. Geological Survey of Canada. 2008. Bedrock Geology Whitehorse (105D) Yukon.

In can be assumed that during the McConnell glaciation as the glaciers advanced sediment in the Deep Creek area was eroded and various glacier features were created in the surficial materials and the bedrock. During the retreat of the glaciers sediment in the form of till was deposited, specifically in areas of low elevation such as the Deep Creek SWF.

Cross-section A-A', shown as Figure 4, illustrates the interpreted conceptual geological and hydrogeological model of the landfill area.

4.3.2 Principal Aquifers

As shown in Figure 4, within the immediate site vicinity and towards Lake Laberge, groundwater occurs within the till, and it is interpreted to extend into the adjacent bedrock. Upgradient and downgradient of the site, the bedrock outcrops and it is assumed that groundwater would be found in this aquifer alone. For the purpose of this report, these units have been named the Bedrock Aquifer and Silt Till Aquifer for ease of reference.

To the south of the site groundwater is expected to be found in the surficial till, fluvial and alluvial deposits.

The principal aquifers in the local region between the site and Deep Creek / Lake Laberge and their type are summarized in Table 4-1.

Table 4-1: Principal Aquifers

Aquifer Name	Location	Aquifer Type	Comment
Bedrock Aquifer	• Underlying and surrounding the site	Fractured rock	• Potentially the main aquifer between the site and Lake Laberge • Outcrops between the site and Lake Laberge • Outcrops indicate that bedrock is highly fractured
Silt Till Aquifer	• Mapped underlying and to the west of the site	Intergranular, porous media	• Unconfined, water table aquifer • Potential local confinement in areas • Underlies the site
Surficial Till/Alluvial/Glaciofluvial Aquifer	• Mapped to the south and west of the site	Intergranular, porous media	• Unconfined, water table aquifer • Potential local confinement in areas • To the south and south east of the site

4.4 GROUNDWATER FLOW SYSTEMS

Groundwater occurrence and flow can generally be described by a series of interconnected flow systems on a regional, intermediate and local scale with flow from areas of recharge to areas of discharge.

4.4.1 Regional and Intermediate Groundwater Flow

Figure 5 shows the site to be located on the southern edge of the catchment draining east towards Lake Laberge and consequently, groundwater flow is expected to be in this direction on a regional scale.

Major regional groundwater flow is expected to be in the bedrock aquifer with intermediate flow occurring in the bedrock aquifer and the overlying till, fluvial and alluvial aquifers. Groundwater recharge to the bedrock aquifer is expected to be primarily through infiltration of rainfall in outcrop areas and through vertical and horizontal leakage from overlying and adjacent aquifers.

4.4.2 Local Groundwater Flow

Local groundwater flow in the vicinity of the Site is expected to be towards Deep Creek to the south or Lake Laberge to the east. Recharge to the Bedrock Aquifer would occur to the west, north and east of the site where bedrock outcrops and is highly fractured. Recharge to the Silt Till Aquifer would occur through infiltration of surface water and lateral inflow from the Bedrock Aquifer. To the east of the site, there may be a component of flow from the Silt Till Aquifer to the Bedrock Aquifer. The flux of water into the Bedrock would be highly dependant upon the degree and interconnectivity of fractures at depth. Deep Creek, to the south of the site, is at an elevation approximately 10 to 20 m below the groundwater elevation at the site. There is the strong potential that groundwater that passes beneath the Site travels in a south/south-easterly direction through the surficial sedimentary aquifers and discharges to Deep Creek.

4.4.3 Groundwater Elevations, Flow Direction, Gradient

Each groundwater monitoring well was completed with the screen installed across the interval where the moisture content of the formation appeared to be transitioning from moist to wet/saturated. Groundwater elevations were measured in each monitoring well during the November 2010 sampling program. At each well the groundwater elevation, post completion, rose above the screened interval and above that logged as being wet/saturated. This indicates either that the well screens were installed below the water table or that there may be a degree of confinement of the aquifer.

There were no definitively identified confining layers noted on the drill logs, although the drilling method (auguring) was not conducive to noting thin potential confining layers. Logs at DC-MW02 and DC-MW03 noted a firm layer approximately 0.5 to 1 m thick immediately above the saturated material inferred to be the top of the aquifer. The firm layer at both wells was also noted to have a lower moisture content than the overlying material.

EBA used the groundwater depth data from November 2010 and well survey elevation information from September 2010 to calculate the groundwater elevation at each monitoring well. The water level measurements and groundwater elevations as of November 15, 2010 are presented in Table 3-3. Figure 6 shows the groundwater elevations and inferred groundwater contours from November 15, 2010.

The groundwater elevation contours indicate flow to the southeast. This flow direction has more of an easterly component to it than that determined at the completion of the drilling program where flow was determined to be to the south-south east. The slight difference in direction is considered due to the disturbed groundwater elevations after drilling works coming to equilibrium in the weeks following.

The flow contours presented in Figure 6 indicate that groundwater is moving towards the outcropping bedrock and is potentially moving from the Silt Till Aquifer into the Bedrock Aquifer. This is consistent with the expected flow direction towards Lake Laberge and Deep Creek as well as the interpreted local groundwater flow direction discussed in Section 4.4.2. Using the data presented in Figure 6, the horizontal hydraulic gradient is approximately 0.0019 m/m towards the southeast.

Given that the inferred groundwater flow direction from the November 2010 monitoring round shows a significant component of easterly flow, following surveying of the monitoring wells, the completion of the 2011 groundwater monitoring events and interpretation of the results, the need for an additional groundwater well on the eastern boundary of the site to assess groundwater quality downgradient of the current construction and demolition stockpile area, hazardous waste area and waste transfer station should be investigated.

4.5 RISING HEAD TEST RESULTS

EBA analyzed two rising head test results (one each for DC-MW01 and DC-MW02) using Hvorslev (1951) and Bouwer & Rice (1976) analysis methods implemented in the AquiferTest™ (ver. 3.0) software. As discussed in Section 3.2.5, there was no data available for interpretation from DC-MW03. The Bouwer & Rice analysis was determined to fit the data better than the Hvorslev analysis and has been used to estimate the hydraulic conductivity of the site.

The hydraulic conductivity testing results and the plots are attached in Appendix G.

The estimated hydraulic conductivities for each well using the two analysis methods are presented in Table 4-2.

Table 4-2: Estimated Hydraulic Conductivity

Monitoring Well ID	Hvorslev (m/s)	Bouwer & Rice (m/s)	Hydrogeological Unit	Geometric mean Hydraulic Conductivity
	Logger Data	Logger Data		
DC-MW01	4.8E-06	6.8E-06	Till	3.8E-06
DC-MW02	2.5E-06	2.1E-06	Till	
DC-MW03	Data logger faulty – no data obtained for analysis			

As shown in Table 4-2, the estimated hydraulic conductivity using the Bouwer and Rice method ranged from 2.1×10^{-6} to 6.8×10^{-6} m/s, with a geometric mean of 3.8×10^{-6} m/s.

4.6 ESTIMATED AVERAGE LINEAR GROUNDWATER VELOCITY

As described above, the geometric mean hydraulic conductivity of the aquifer at the two locations measured is $3.8\text{x}10^{-6}$ m/s and the observed hydraulic gradient across the property was 0.0019 m/m towards the southeast. Average linear groundwater velocity is calculated using the following equation:

$$V = (K\, i) / n$$

Where: V : is groundwater velocity in metres per second (m/s);

K : is hydraulic conductivity in metres per second (m/s);

i : is horizontal hydraulic gradient in metres/metres (m/m); and,

n : is porosity (%).

This results in an estimated average groundwater velocity of approximately 0.6 m per year, assuming a porosity of the silt till of 0.4. However, the groundwater may travel much faster through permeable bedrock fractures, depending on the degree of fracture interconnectivity.

4.7 POTENTIAL FOR CONTAMINATION OF GROUNDWATER AND TRANSPORT MECHANISMS

The following identified potential sources of groundwater contamination are based on site history and inspection, anecdotal information and processes governing the generation and transport of leachate in landfills. Potential sources identified include:

- Leachate sourced from the former garbage disposal trenches and other decomposable matter present in construction materials, grubbing waste and other miscellaneous material (e.g. treated wood, plant matter). These contaminants include heavy metals, nutrients (NH_3, NO_3), organic hydrocarbons (fuels, PAHs, chlorinated hydrocarbons) and salts;
- Petroleum hydrocarbons and other organic compounds from stockpiled vehicles;
- Leakage and spillage of hydrocarbons from onsite storage areas;
- There were no off-site sources of pollution identified during the site inspection or the review of the site history which could be considered to have impacted upon the groundwater flowing beneath the site.

The main pathways for the transport of contaminants from the sources identified above to groundwater and downgradient receptors are:

- Percolation of leachate from waste deposits and other identified contaminants through underlying soils to the Silt Till Aquifer.
- Transport of contaminants within the Silt Till Aquifer and Bedrock Aquifer towards downgradient discharge locations.

5.0 GROUNDWATER IMPACT ASSESSMENT

5.1 REVIEW OF GROUNDWATER CHEMISTRY

One round of groundwater sampling was conducted as discussed in section 3.2.3. Copies of original laboratory reports and Chain of Custody documentation are included in Appendix F. Tabulated laboratory results are presented in Table 1. Table 5-1 summarizes some of the key water quality results from lab testing that can indicate impact to groundwater from landfilling activities.

Table 5-1: Key Groundwater Chemistry Results

Monitoring Well ID	TDS (mg/L)	Ammonia (mg/L)	Sulphate (mg/L)	HEPH (mg/L)	LEPHw (mg/L)	Total Xylene (mg/L)	Uranium (mg/L)
DC-MW01	4,060	0.32	2,090	< 0.1	0.1	0.004	0.0764
DC-MW02	814	0.08	268	< 0.1	< 0.1	< 0.001	0.0021
DC-MW03	3,540	0.05	1,710	<0.1	< 0.1	< 0.001	0.0049
TKC Admin Well*	1,260	-	647	-	-	-	0.00883
TKC Community Well#	130	0.01	10	-	-	-	<0.0005
Horse Creek Well#	1,080	0.097	714	-	-	-	0.0009

samples analyzed in October 2003 * samples analyzed in September 2001

Table 5-2 details analytes which exceed the most stringent CSR Schedule 3 criteria for each of the applicable Water Uses. Laboratory test results from groundwater samples collected during November 2010 have been used in assessing against criteria values. Table 1 presents all laboratory analytical results and compares all results against applicable guidelines.

Table 5-2: Groundwater Results Exceeding Most Stringent CSR Schedule 3 Criteria[1]

Parameter	Guideline Value	Water Use	Well ID		
			DC-MW01	DC-MW02	DC-MW03
Sulphate	500	Drinking Water (aesthetic)	**2090**	NE	**1,710**
Magnesium	100	Drinking Water (aesthetic)	**560**	**114**	**480**
Iron	0.3	Drinking Water (aesthetic)	NE	NE	**1.5**
Uranium	20	Drinking Water	**76.4**	**NE**	**NE**
Manganese	0.05	Drinking Water (aesthetic)	**0.491**	**0.158**	**0.09**

[1]All results in mg/L NE – Guideline Value Not Exceeded

A discussion of key groundwater parameters that potentially indicate impact of the aquifer from the waste disposal facility and exceedences of relevant water quality guideline criteria are presented below. Due to the inferred background monitoring well potentially being impacted by landfilling operations, data from several wells to the south in the Ta'an Kwach'an Property, screened in bedrock and sand aquifers, have been used for comparative purposes.

Total Dissolved Solids

Total Dissolved Solids (TDS) can indicate groundwater contamination from a waste disposal facility, with dissolved constituents of the degradation of organic waste (typically NO3, NH3, Na, K, Mg, Ca, SO4, Cl, HCO3) contributing to an increase in TDS concentration. The TDS of the monitoring wells ranged from 814 mg/L (DC-MW02) to 4060 mg/L (DC-MW01) across the site. DC-MW01, which is inferred to be an upgradient well, reported a concentration over 3000 mg/L higher than DC-MW02.

The conceptual hydrogeological model indicates that there is a component of lateral flow from the Bedrock Aquifer into the Silt Till Aquifer. The high concentration at DC-MW01 is unlikely to be due solely to recharge of high TDS groundwater from the bedrock, given that a review of TDS concentrations of two nearby wells screened in the bedrock showed concentrations of around 1000 to 1400 mg/L. It is considered likely, given there is no identified sources of contamination other than the landfill, that the elevated TDS at DC-MW01 and DC-MW03 is linked to landfilling operations. Whilst not identified during the site history or inspection, there is a possibility of historical dumping of waste to the north of the landfill which has impacted the upgradient groundwater quality. Alternatively, there may be mounding of leachate beneath the landfill area or lateral movement of high TDS leachate in the unsaturated zone, along low permeability layers of the formation. Whilst low permeability layers were not logged during drilling works, this drilling method is not conducive to observing thin layers in a formation.

While there was no information available to EBA on groundwater quality in the Silt Till Aquifer, the reported TDS concentration at DC-MW02 (814 mg/L) is in line with that expected, given the concentrations reported at the wells at the Ta'an Kwach'an Property (130 mg/L to 1260 mg/L). The TDS concentration reported at both the upgradient well (DC-MW01) and downgradient well (DC-MW03) indicates impact from the landfill given the low concentrations reported at DC-MW02 and at nearby drinking water supply wells.

Ammonia

Ammonia is a typical constituent of landfill leachate and an indicator of contamination sourced from a landfill.

The concentrations of ammonia reported at all three wells were below the applicable guideline criteria.

Ammonia concentrations in two local drinking water wells at the Ta'an Kwach'an Property are reported at 0.097 mg/L (bedrock) and 0.01 mg/L (sand).The concentration at background well DC-MW01 (0.32 mg/L) appears elevated when compared to downgradient wells DC-MW02 (0.08 mg/L) and DC-MW03 (0.05 mg/L) and in comparison to the concentrations at the drinking water wells at the Ta'an Kwach'an Property which would be considered to be un-impacted.

Although DC-MW01 is inferred to be upgradient of the landfill, elevated ammonia concentrations indicate contamination of the groundwater at this location sourced from landfilling operations.

Sulphate

Sulphate concentrations appear elevated at DC-MW01 and DC-MW03 when compared to the concentrations reported at DC-MW02 and inferred natural background concentrations in nearby local

wells at the Ta'an Kwach'an Property (which range from 10 mg/L to 647 mg/L). Sulphate concentrations are typically elevated in landfill leachate, indicating impact from landfill operations at these two locations.

The concentrations reported at DC-MW01 and DC-MW03 exceed the criteria for Aquatic Life and Aesthetic Drinking Water. Given that it appears that the concentrations are higher than background and most likely sourced from the landfill, this contamination precludes these water uses at these locations.

Metals

Most metals, including mercury, cadmium and arsenic reported relatively consistent concentrations across the site.

Iron was reported below the laboratory MDL (0.005 mg/L) at DC-MW01 and DC-MW02, whilst was considerably higher at DC-MW03 (1.5 mg/L). The concentration at DC-MW03 exceeds the applicable aesthetic Drinking Water guideline criteria. Iron is reported at concentrations up to 11.3 mg/L in nearby drinking water supply wells at the Ta'an Kwach'an Property, although given the direction of groundwater flow (shown in Figure 6) the higher iron concentration is potentially sourced from the cars, white-goods, old fuel tanks and other miscellaneous metal items stockpiled on the north-west corner of the site.

Uranium was detected in DC-MW01 at a concentration in excess of the criteria for Drinking Water Use. The reported concentrations are considered to be naturally occurring, with uranium detected in groundwater in two nearby drinking water wells, as well as at several other locations in Yukon (Champagne, Copper Ridge). Uranium in groundwater is often sourced from magmatic rock. The bedrock mapped in the region is described as being constituted of multiple rock types, including volcanic, and the presence of uranium in the till aquifer indicates a component of recharge to the till aquifer beneath the site from the bedrock.

Manganese was detected in all monitoring wells at concentrations ranging from 0.09 mg/L (DC-MW03) to 0.491 mg/L (DC-MW01). These concentrations were above the applicable guideline criteria for aesthetic Drinking Water. These concentrations are considered to be background concentrations given that concentrations in water supply wells in the nearby vicinity report manganese at concentrations from < 0.002 mg/L to 0.465 mg/L.

Magnesium exceeds the applicable aesthetic Drinking Water guideline criteria in all wells on site. Concentrations at DC-MW01 and DC-MW03 appear elevated when compared to the concentrations reported at DC-MW02 and inferred natural background concentrations in nearby local wells (which range from 1.2 mg/L to 87.9 mg/L). Magnesium concentrations can become elevated in landfill leachate, indicating impact from landfill operations at these two locations.

Organics

LEPHw, Total Xylene, (m & p) Xylene and (o) Xylene were reported at concentrations above the laboratory MDL at DC-MW01 but below the applicable water use criteria.

Detections of these analytes indicate impact from landfilling operations, given they are not compounds that are typically considered to be found naturally in groundwater.

5.2 INTERPRETATION OF GROUNDWATER CHEMISTRY

A comparison of groundwater chemistry for major ions for each well is displayed in the Schoeller Plot (Figure 7) and Piper Diagram (Figure 8). Stiff Diagrams provide a plot of major ions that can be easily interpreted in terms of relative percentages of cations and anions. Stiff Diagrams for each of the sample locations are presented in plan format as Figure 9, as an aid to interpretation of the spatial distribution of groundwater chemistry.

Groundwater from DC-MW01 and DC-MW03 can be characterized as magnesium-sulphate type waters, whilst DC-MW02 can be characterized as high magnesium-bicarbonate groundwater. The Piper Plot and Stiff diagrams indicate that DC-MW01 and DC-MW03 have similar chemistry whilst DC-MW02 displays different chemical compositions. It is notable that DC-MW01, inferred to be located upgradient of the landfill area, exhibits similar chemistry to the downgradient location DC-MW03. This is confirmed by the Schoeller diagram in Figure 7, with relative proportions of major ions in each well almost matching each other. Both wells exhibit elevated TDS and sulphate when compared to DC-MW02 and local drinking water TDS concentrations and DC-MW01 reported an elevated ammonia concentration, suggesting both wells have been impacted by leachate sourced from the landfill.

Uranium, believed to be sourced from the Bedrock Aquifer, was detected in all wells, which indicates a component of recharge to the Silt Till Aquifer from the Bedrock Aquifer.

Heavy metals (including mercury, cadmium and arsenic) concentrations in groundwater are considered to be background given the consistent concentration reported across the site.

The Stiff diagram presented for DC-MW02 shows that this well exhibits a different chemical composition to DC-MW01 and DC-MW03 which may indicate a lesser degree of impact from contaminants sourced from the landfill operations.

Whilst the chemistry of DC-MW01 is indicative of contamination sourced from a landfill, the inferred groundwater flow direction shown in Figure 6 suggests there exists the potential for an upgradient source of the elevated parameters discussed in Section 5.1 . This source could potentially be unidentified buried waste or may be the natural chemical composition of groundwater inferred to be recharging the Silt Till Aquifer from the Bedrock Aquifer.

The source of the elevated parameters in DC-MW01 and the need for further investigation into their source be re-assessed following surveying of monitoring wells, the completion of the 2011 groundwater monitoring events and the interpretation of results. This investigation should include the physical inspection of the area upgradient of the landfill for former waste burial areas and potentially include installation of additional up and down gradient monitoring wells.

6.0 CONCLUSIONS

The field work for the 2010 Monitoring Well Program at the Deep Creek Waste Disposal Facility was completed between May 8, 2010 and November 15, 2010. The current water sampling network includes three groundwater monitoring wells.

The following conclusions are made based on the findings of the 2010 hydrogeological assessment:

- Three monitoring wells DC-MW01, DC-MW02 and DC-MW03 were installed in September 2010 in areas north and south of the waste disposal facility to establish a groundwater monitoring network at the Site. All monitoring wells were completed in till with a slotted section at the well bottom to allow groundwater entry;
- Based on groundwater elevation data, monitoring wells DC-MW02 and DC-MW03 appear to be down-gradient of the Site and DC-MW01 up-gradient; however, additional groundwater elevation data are necessary to identify potential seasonal changes and confirm the conceptual hydrogeological model;
- No monitoring or sampling of groundwater is believed to have been conducted at the Site prior to the fall 2010 field program;
- The conceptual hydrogeological model indicates that there is a degree of recharge to the Silt Till Aquifer from the Bedrock Aquifer. Groundwater flow downgradient of the site is expected to be predominately to the southeast towards Deep Creek where groundwater would be expected to discharge, although this cannot be confirmed without the installation of additional wells;
- Analysis of the rising head hydraulic response test results show that the geometric mean of the hydraulic conductivity of the till is about 4×10^{-6} m/s and the estimated average linear groundwater velocity is 0.6 m/year.
- Concentrations of sulphate at monitoring wells DC-MW01 and DC-MW03 exceed the CSR-Aquatic Water criteria;
- Concentrations of magnesium and manganese at monitoring wells DC-MW01, DC-MW02 and DC-MW03 exceed the CSR-Drinking Water (aesthetic) criteria;
- The concentration of iron at monitoring well DC-MW03 exceeds the CSR-Drinking Water (aesthetic) standard;
- The concentrations of uranium at monitoring well DC-MW01 exceeds the CSR-Drinking Water standard;
- All other analytes were below the applicable guideline criteria;
- Extractable petroleum hydrocarbon concentrations (LEPHw and HEPH) in all monitoring wells were below the laboratory Method Detection Limit (MDL) of 0.1 mg/L with the exception of the LEPHw concentration at the MDL detected in DC-MW01. This detection was below the applicable guideline value for Aquatic Water of 0.5 mg/L;
- PAH and VOC concentrations were below the laboratory MDLs in all wells other than for detectable concentrations of xylenes at DC-MW01. The detectable concentration of Total Xylene was below the applicable guideline value for the CSR-Drinking Water guideline;
- Ammonia, an indicator of landfill leachate contamination, was detected in all monitoring wells. The concentration at the inferred upgradient monitoring well DC-MW01 were four times higher than that reported at downgradient well DC-MW02 and six times higher than downgradient well DC-MW03.
- A review of groundwater monitoring results indicates groundwater at monitoring wells DC-MW01 and DC-MW03 has potentially been impacted by contaminants sourced from landfilling operations.

DC-MW02 has also potentially been impacted, although if impacted, to a significantly lesser extent than the other two wells.

- To more definitively assess impact on groundwater quality from the landfill and confirm the conceptual hydrogeological model, additional monitoring wells may be required to be installed to assess groundwater quality.

7.0 RECOMMENDATIONS

The following recommendations are made based on the findings of the 2010 hydrogeological assessment:

- As required by the Site's Waste Disposal Facility Permit, future monitoring programs should be completed once during the spring freshet when the most significant groundwater recharge occurs and once in late summer,
- A site inspection be undertaken by a qualified hydrogeologist prior to the next sample round to identify a suitable location to obtain up and down gradient samples from Deep Creek.
- DC-MW01, DC-MW02 and DC-MW03 should be surveyed by a professional surveyor for location and elevation prior to the next monitoring round. Elevations from the top of the PVC casing and from ground level immediately adjacent to the well should be reported.
- Following the survey of the monitoring wells and the next round of sampling in 2011, data should be reviewed by a qualified hydrogeologist and the need for additional up-gradient and downgradient monitoring wells assessed.

8.0 CLOSURE

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

Sincerely,
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TABLES

					LocCode	DC-MW01	DC-MW02	DC-MW03	DC-MW03	DC-MW03
					Field_ID	DC-MW01	DC-MW02	DC-MW03	DC-QC02	DC-QC03
					SampleCode	774941-1	774941-2	774941-3	774941-5	B0B2367_2010/11/17_DC-QC03
					Sampled_Date-Time	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010
					Lab_Report_Number	1388991	1388991	1388991	1388991	B0B2367
Method_Type	**ChemName**	**Units**	**EQL**	**CSR Schedule 3 - Aquativ Water**	**CSR Schedule 6 - Drinking Water**					
ESDAT Combined Compounds	Trihalomethanes	mg/L			**0.1**	<0.004[#2]	<0.004[#2]	<0.004[#2]	-	-
	Xylene Total	µg/L			**300**	4[#1]	<2[#2]	<2[#2]	-	-
Extractable Petroleum Hydrocarbons - Water	HEPH	µg/L	100			<100	<100	<100	-	-
	LEPHw	µg/L	100	500		100	<100	<100	-	-
Inorganic Nonmetallic Parameters	Ammonia as N	µg/L	10			320	80	50	40	-
	Dissolved Organic Carbon	mg/L	0.5			14.2	5.7	4	-	-
	Kjeldahl Nitrogen Total	mg/L	0.06			2.1	0.58	0.71	-	-
	Nitrate (as N)	mg/L	0.01	400	**10**	-	-	-	<0.01	<0.02
	Ortho phosphate (as P)	mg/L	0.01			0.09	0.08	0.09	-	-
	Phosphorus	mg/L	0.05			9.31	2.45	0.96	-	-
Metals Dissolved	Sulphur as S	mg/L	0.2			660	78.2	553	572	717
Misc. Inorganics	Hardness as CaCO3 (Filtered	mg/L	0.5			-	-	-	-	2,540
Nutrients	Ammonia	mg/L	0.005	1.31		-	-	-	-	0.089
	Nitrogen (Total Oxidised)	mg/L	0.02	400	**10**	-	-	-	-	<0.02
Physical and Aggregate Properties	Total Solids	µg/L	5000			4,060,000	814,000	3,540,000	-	-
Polycyclic Aromatic Hydrocarbons - Water	Acridine	mg/L	0.00005	0.0005		<0.00005	<0.00005	<0.00005	-	-
	Acenaphthene	µg/L	0.1	60		<0.1	<0.1	<0.1	-	-
	Acenaphthylene	µg/L	0.1			<0.1	<0.1	<0.1	-	-
	Anthracene	µg/L	0.1	1		<0.1	<0.1	<0.1	-	-
	Benz(a)anthracene	µg/L	0.01	1		<0.01	<0.01	<0.01	-	-
	Benzo(a) pyrene	µg/L	0.01	0.1	**0.01**	<0.01	<0.01	<0.01	-	-
	Benzo(b)fluoranthene	µg/L	0.01			<0.01	<0.01	<0.01	-	-
	Benzo(g,h,i)perylene	µg/L	0.1			<0.1	<0.1	<0.1	-	-
	Benzo(k)fluoranthene	µg/L	0.02			<0.02	<0.02	<0.02	-	-
	Chrysene	µg/L	0.1			<0.1	<0.1	<0.1	-	-
	Dibenz(a,h)anthracene	µg/L	0.01			<0.01	<0.01	<0.01	-	-
	Fluoranthene	µg/L	0.1	2		<0.1	<0.1	<0.1	-	-
	Fluorene	µg/L	0.1	120		<0.1	<0.1	<0.1	-	-
	Indeno(1,2,3-c,d)pyrene	µg/L	0.1			<0.1	<0.1	<0.1	-	-
	Naphthalene	µg/L	0.1	10		<0.1	<0.1	<0.1	-	-
	Phenanthrene	µg/L	0.1	3		<0.1	<0.1	<0.1	-	-
	Pyrene	µg/L	0.02	0.2		<0.02	<0.02	<0.02	-	-
	Quinoline	µg/L	3.4	34		<3.4	<3.4	<3.4	-	-
Routine Water	Alkalinity (Bicarbonate)	mg/L	5			640	530	700	-	-
	Alkalinity (Carbonate)	mg/L	6			<6	<6	<6	-	-
	Alkalinity (Hydroxide) as CaC	µg/L	5000			<5,000	<5,000	<5,000	-	-
	Alkalinity (total) as CaCO3	mg/L	5			529	438	579	-	-
	Calcium	mg/L	0.1			142	53.4	200	207	224
	Chloride	mg/L	0.02		**250**	15.4	5.89	10.3	-	-
	Magnesium	mg/L	0.1		**100**	**560**	**114**	**454**	**459**	**480**
	Nitrogen (Total Oxidised)	mg/L	0.01	400	**10**	<0.07	<0.01	<0.07	-	-
	Phosphorus	mg/L	0.01			0.02	0.01	0.01	<0.01	-
	Potassium	mg/L	0.1			4.8	2.3	3.3	3.5	3.78
	Silicon	µg/L	50			5,630	6,610	6,730	6,750	8,100
	Sodium	mg/L	0.1		**200**	98.3	32	52	56.8	60.8
	Sulphate	mg/L	0.05	1000	**500**	**2,090**	268	**1,710**	-	-
	Hardness as CaCO3	mg/L	5			2,660	603	2,370	2,410	-
Trace Metals Dissolved	Aluminium	mg/L	0.005		**0.2**	<0.005	<0.005	<0.005	<0.005	<0.003
	Antimony	mg/L	0.0002	0.2	**0.006**	0.0006	<0.0002	<0.0002	<0.0002	<0.0005
	Arsenic	mg/L	0.0002	0.05	**0.01**	0.0091	0.0077	0.0092	0.0082	0.0086
	Barium	mg/L	0.001	10	**1**	0.023	0.039	0.011	0.012	0.013
	Beryllium	mg/L	0.00004	0.053		<0.00004	<0.00004	<0.00004	<0.00004	<0.0001
	Bismuth	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001
	Boron	mg/L	0.004		**5**	0.033	0.025	0.012	0.013	<0.05
	Cadmium	mg/L	0.00001	0.0001	**0.005**	0.00008	0.00002	<0.00001	<0.00001	0.00001
	Chromium (III+VI)	mg/L	0.0004		**0.05**	0.0004	<0.0004	0.0004	0.0004	<0.001
	Cobalt	mg/L	0.00002	0.009		0.00485	0.00103	0.00084	0.00099	0.0009
	Copper	mg/L	0.001	0.02	**1**	0.004	<0.001	0.003	0.002	0.0064

					LocCode	DC-MW01	DC-MW02	DC-MW03	DC-MW03	DC-MW03
					Field_ID	DC-MW01	DC-MW02	DC-MW03	DC-QC02	DC-QC03
					SampleCode	774941-1	774941-2	774941-3	774941-5	B0B2367_2010/11/17_DC-QC03
					Sampled_Date-Time	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010
					Lab_Report_Number	1388991	1388991	1388991	1388991	B0B2367
Method_Type	**ChemName**	**Units**	**EQL**	**CSR Schedule 3 - Aquativ Water**	**CSR Schedule 6 - Drinking Water**					
	Iron	mg/L	0.01		**0.3**	<0.005	<0.005	**1.5**	**1.04**	**1.16**
	Lead	mg/L	0.0001	0.04	**0.01**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002
	Lithium	mg/L	0.001			0.01	0.01	0.023	0.024	0.025
	Manganese	mg/L	0.005		**0.05**	**0.491**	**0.158**	**0.058**	**0.069**	**0.09**
	Mercury	mg/L	0.00001	0.001	**0.001**	<0.00001	<0.00001	<0.00001	<0.00001	0.00004
	Molybdenum	mg/L	0.0001	10	**0.25**	0.0097	0.0097	0.0018	0.0025	0.003
	Nickel	mg/L	0.001	0.25		0.021	0.003	0.005	0.005	0.005
	Selenium	mg/L	0.0006	0.01	**0.01**	<0.0006	<0.0006	<0.0006	<0.0006	<0.0001
	Silver	mg/L	0.00001	0.0005		<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
	Strontium	mg/L	0.001			3.032	1.434	4.745	5.011	4.18
	tellurium	µg/L	0.1			<0.1	<0.1	<0.1	<0.1	
	Thallium	mg/L	0.00001	0.003		0.00004	<0.00001	<0.00001	<0.00001	<0.00005
	Thorium	µg/L	0.4			<0.4	<0.4	<0.4	<0.4	-
	Tin	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.005
	Titanium	mg/L	0.0004	1		0.0009	0.0007	0.0009	0.0011	<0.005
	Uranium	µg/L	0.4	3000	**20**	**76.4**	2.1	4.9	5.9	6.8
	Vanadium	mg/L	0.0001			0.001	0.0003	0.0002	0.0002	<0.005
	Zinc	mg/L	0.001	0.075	**5**	0.01	0.003	0.005	0.006	0.009
	Zirconium	µg/L	0.1			0.7	0.1	0.3	0.3	<0.5
VOC Screen - Water	1,1,1-trichloroethane	µg/L	1			<1	<1	<1	-	-
	1,1,2,2-tetrachloroethane	µg/L	1			<1	<1	<1	-	-
	1,1-dichloroethane	µg/L	1			<1	<1	<1	-	-
	1,1-dichloroethene	µg/L	1		**14**	<1	<1	<1	-	-
	1,2-dichlorobenzene	µg/L	1		**3**	<1	<1	<1	-	-
	1,2-dichloroethane	µg/L	1	1000	**5**	<1	<1	<1	-	-
	1,2-dichloropropane	µg/L	1			<1	<1	<1	-	-
	1,3-dichlorobenzene	µg/L	1	1500		<1	<1	<1	-	-
	1,4-dichlorobenzene	µg/L	1	260	**1**	<1	<1	<1	-	-
	2-Chloroethylvinyl ether	mg/L	0.001			<0.001	<0.001	<0.001	-	-
	Benzene	µg/L	1	4000	**5**	<1	<1	<1	-	<0.4
	Bromodichloromethane	µg/L	1		**16**	<1	<1	<1	-	-
	Bromoform	µg/L	1		**100**	<1	<1	<1	-	-
	Bromomethane	µg/L	10			<10	<10	<10	-	-
	Carbon tetrachloride	µg/L	1	130	**5**	<1	<1	<1	-	-
	Chlorobenzene	µg/L	1	13	**30**	<1	<1	<1	-	-
	Chlorodibromomethane	µg/L	1		**100**	<1	<1	<1	-	-
	Chloroethane	µg/L	10			<10	<10	<10	-	-
	Chloroform	µg/L	1	20	**100**	<1	<1	<1	-	-
	Chloromethane	µg/L	10			<10	<10	<10	-	-
	cis-1,2-dichloroethene	µg/L	1			<1	<1	<1	-	-
	cis-1,3-dichloropropene	µg/L	1			<1	<1	<1	-	-
	Dichloromethane	µg/L	5	980	**50**	<5	<5	<5	-	-
	Ethylbenzene	µg/L	1	2000	**2.4**	<1	<1	<1	-	<0.4
	Styrene	µg/L	1	720		<1	<1	<1	-	<0.4
	Trichloroethene	µg/L	1	200	**5**	<1	<1	<1	-	-
	Tetrachloroethene	µg/L	1	1100	**30**	<1	<1	<1	-	-
	Toluene	µg/L	1	390	**24**	<1	<1	<1	-	<0.4
	trans-1,2-dichloroethene	µg/L	1			<1	<1	<1	-	-
	trans-1,3-dichloropropene	µg/L	1			<1	<1	<1	-	-
	Trichlorofluoromethane	µg/L	1			<1	<1	<1	-	-
	Vinyl chloride	µg/L	2		**2**	<2	<2	<2	-	-
	Xylene (m & p)	µg/L	1			2	<1	<1	-	<0.4
	Xylene (o)	µg/L	1			2	<1	<1	-	<0.4
	Xylene Total	µg/L	1		**300**	4	<1	<1	-	<0.4
Volatile Petroleum Hydrocarbons - Water	VPH C6-C10	µg/L	50	1500	**15000**	<50	<50	<50	<50	<300
	VPHw	µg/L	50	1500		<50	<50	<50	<50	-

Comments
#1 ESDAT Combined with Non-Detect Multiplier of 0.5.
#2 ESDAT Combined.

Field Duplicates (Water)	**SDG**	A157946	A157946		A157946	Interlab_D	
Filter: ALL	**Field_ID**	DC-MW03	DC-QC02	**RPD**	DC-MW03	DC-QC03	**RPD**
	Sampled_Date-Time	11/15/2010	11/15/2010		11/15/2010	11/15/2010	

Chem_Group	ChemName	Units	EQL						
	tellurium	µg/L	0.1	<0.1	<0.1	0	<0.1		
BTEX	Benzene	µg/L	1 (Primary): 0.4 (Interlab)	<1.0			<1.0	<0.4	0
	Ethylbenzene	µg/L	1 (Primary): 0.4 (Interlab)	<1.0			<1.0	<0.4	0
	Toluene	µg/L	1 (Primary): 0.4 (Interlab)	<1.0			<1.0	<0.4	0
	Xylene (m & p)	µg/L	1 (Primary): 0.4 (Interlab)	<1.0			<1.0	<0.4	0
	Xylene (o)	µg/L	1 (Primary): 0.4 (Interlab)	<1.0			<1.0	<0.4	0
	Xylene Total	µg/L	1 (Primary): 0.4 (Interlab)	<1.0			<1.0	<0.4	0
Inorganics	Nitrogen (Total Oxidised)	mg/l	0.01 (Primary): 0.02 (Interlab)	<0.07			<0.07	<0.02	0
	Sodium	mg/l	0.1 (Primary): 0.05 (Interlab)	52.0	56.8	9	52.0	60.8	16
	Sulphur as S	mg/l	0.2 (Primary): 3 (Interlab)	553.0	572.0	3	553.0	717.0	26
	Thorium	µg/L	0.4	<0.4	<0.4	0	<0.4		
	Hardness as CaCO3	mg/l	5	2370.0	2410.0	2	2370.0		
Lead	Lead	mg/l	0.0001 (Primary): 0.0002 (Interlab)	<0.0001	<0.0001	0	<0.0001	<0.0002	0
MAH	Styrene	µg/L	1 (Primary): 0.4 (Interlab)	<1.0			<1.0	<0.4	0
Metals	Aluminium	mg/l	0.005 (Primary): 0.003 (Interlab)	<0.005	<0.005	0	<0.005	<0.003	0
	Antimony	mg/l	0.0002 (Primary): 0.0005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0005	0
	Arsenic	mg/l	0.0002 (Primary): 0.0001 (Interlab)	0.0092	0.0082	11	0.0092	0.0086	7
	Barium	mg/l	0.001	0.011	0.012	9	0.011	0.013	17
	Beryllium	mg/l	0.00004 (Primary): 0.0001 (Interlab)	<0.0	<0.0	0	<0.0	<0.0001	0
	Bismuth	mg/l	0.001	<0.001	<0.001	0	<0.001	<0.001	0
	Boron	mg/l	0.004 (Primary): 0.05 (Interlab)	0.012	0.013	8	0.012	<0.05	0
	Cadmium	mg/l	0.00001	<0.0	<0.0	0	<0.0	0.0	0
	Calcium	mg/l	0.1 (Primary): 0.05 (Interlab)	200.0	207.0	3	200.0	224.0	11
	Chromium (III+VI)	mg/l	0.0004 (Primary): 0.001 (Interlab)	0.0004	0.0004	0	0.0004	<0.001	0
	Cobalt	mg/l	0.00002 (Primary): 0.0005 (Interlab)	0.0008	0.001	16	0.0008	0.0009	7
	Copper	mg/l	0.001 (Primary): 0.0002 (Interlab)	0.003	0.002	40	**0.003**	**0.0064**	**72**
	Iron	mg/l	0.01 (Primary): 0.005 (Interlab)	**1.5**	**1.04**	**36**	1.5	1.16	26
	Lithium	mg/l	0.001 (Primary): 0.005 (Interlab)	0.023	0.024	4	0.023	0.025	8
	Magnesium	mg/l	0.1 (Primary): 0.05 (Interlab)	454.0	459.0	1	454.0	480.0	6
	Manganese	mg/l	0.005 (Primary): 0.001 (Interlab)	0.058	0.069	17	**0.058**	**0.09**	**43**
	Mercury	mg/l	0.00001 (Primary): 0.00002 (Interlab)	<0.0	<0.0	0	<0.0	0.0	120
	Molybdenum	mg/l	0.0001 (Primary): 0.001 (Interlab)	**0.0018**	**0.0025**	**33**	**0.0018**	**0.003**	**50**
	Nickel	mg/l	0.001	0.005	0.005	0	0.005	0.005	0
	Phosphorus	mg/l	0.01	0.01	<0.01	0	0.01		
	Potassium	mg/l	0.1 (Primary): 0.05 (Interlab)	3.3	3.5	6	3.3	3.78	14
	Selenium	mg/l	0.0006 (Primary): 0.0001 (Interlab)	<0.0006	<0.0006	0	<0.0006	<0.0001	0
	Silicon	µg/l	50 (Primary): 100 (Interlab)	6730.0	6750.0	0	6730.0	8100.0	18
	Silver	mg/l	0.00001 (Primary): 0.00002 (Interlab)	<0.0	<0.0	0	<0.0	<0.0	0
	Strontium	mg/l	0.001	4.745	5.011	5	4.745	4.18	13
	Thallium	mg/l	0.00001 (Primary): 0.00005 (Interlab)	<0.0	<0.0	0	<0.0	<0.0001	0
	Tin	mg/l	0.0001 (Primary): 0.005 (Interlab)	<0.0001	<0.0001	0	<0.0001	<0.005	0
	Titanium	mg/l	0.0004 (Primary): 0.005 (Interlab)	0.0009	0.0011	20	0.0009	<0.005	0
	Uranium	µg/L	0.4 (Primary): 0.1 (Interlab)	4.9	5.9	19	**4.9**	**6.8**	**32**
	Vanadium	mg/l	0.0001 (Primary): 0.005 (Interlab)	0.0002	0.0002	0	0.0002	<0.005	0
	Zinc	mg/l	0.001 (Primary): 0.005 (Interlab)	0.005	0.006	18	0.005	0.009	57
	Zirconium	µg/L	0.1 (Primary): 0.5 (Interlab)	0.3	0.3	0	0.3	<0.5	0
TPH	VPH C6-C10	µg/L	50 (Primary): 300 (Interlab)	<50.0	<50.0	0	<50.0	<300.0	0
	VPHw	µg/L	50	<50.0	<50.0	0	<50.0		

*RPDs have only been considered where a concentration is greater than 5 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 30 (5-10 x EQL); 30 (10-30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

FIGURES

LEGEND

- Site Location
- Contour (100 ft)
- Transmission Line
- Limited Use Road
- Bridge
- Road
- Watercourse
- Waterbody
- Wetland
- Vegetation

NOTES
Base data source:
NTS 1:50,000 (Sheet 105E03)

STATUS
ISSUED FOR USE

HYDROGEOLOGICAL ASSESSMENT
DEEP CREEK WASTE DISPOSAL FACILITY

Site Location

PROJECTION	DATUM	CLIENT
UTM Zone 8	NAD83	Yukon Government

Scale: 1:50,000
1 0.5 0 1
Kilometres

FILE NO. W23101317_007_Figure1_DeepCreek.mxd

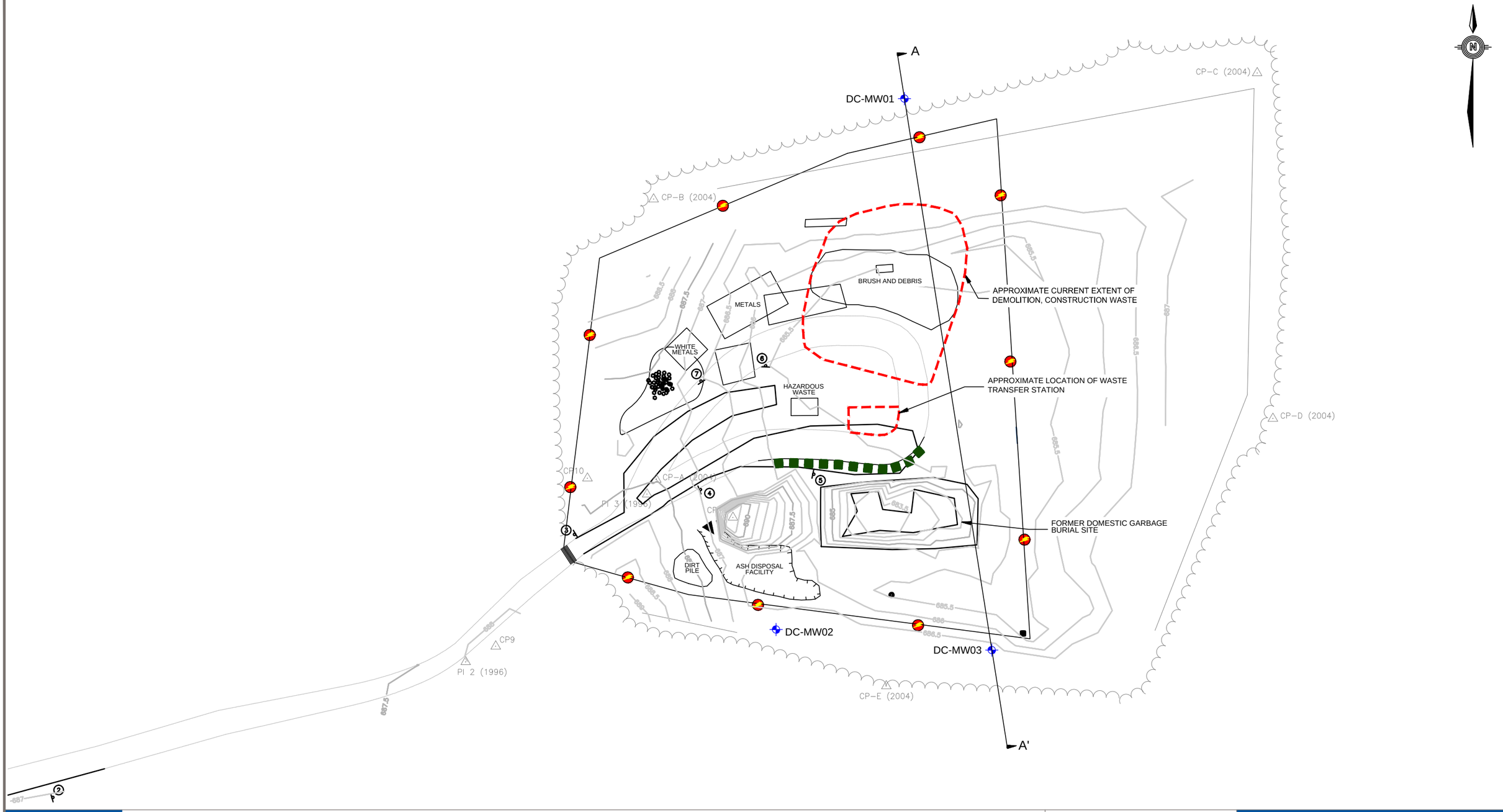
PROJECT NO.	DWN	CKD	APVD	REV
W23101317.007	SL	AJS	AJS	0

OFFICE	DATE
EBA-VANC	March 24, 2011

eba A TETRA TECH COMPANY

Figure 1

Q:\Vancouver\GIS\ENVIRONMENTAL\W231\W23101317_MWProgramMaps\007\W23101317_007_Figure1_DeepCreek.mxd modified 3/24/2011 by sleusink



LEGEND

- MONITORING WELL LOCATION
- 687 - GROUND ELEVATION CONTOUR
- ELECTRIC FENCE
- A A' - CROSS-SECTION ALIGNMENT

0 50

Scale: 1: 1000 (metres)

CLIENT

Yukon Government
Department of Community Services

HYDROGEOLOGICAL ASSESSMENT
DEEP CREEK WASTE DISPOSAL FACILITY, YUKON

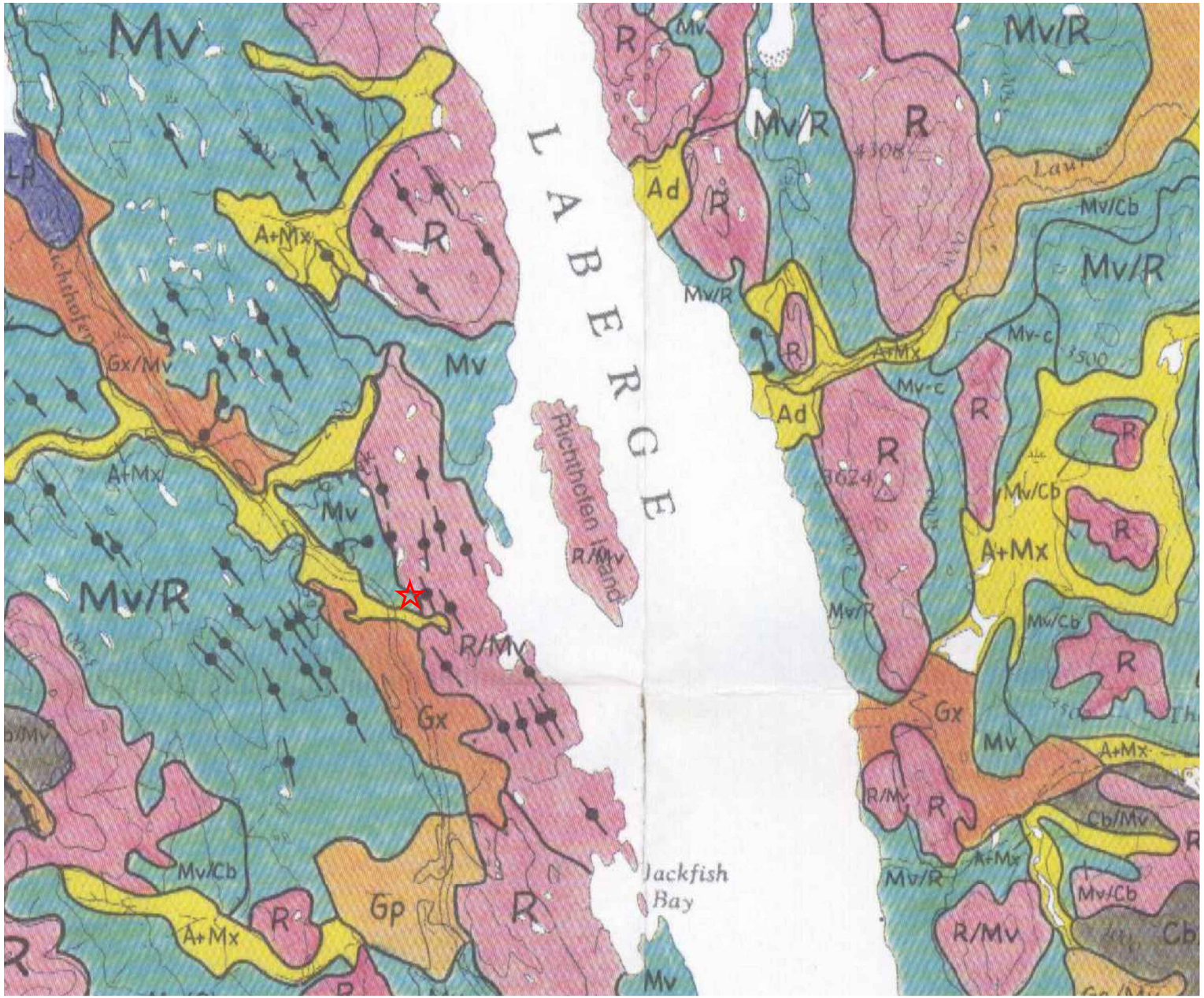
SITE PLAN AND CROSS SECTION ALIGNMENT

eba A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W23101317.007	CB	AJS	0

OFFICE	DATE
EBA-WHSE	December 20, 2010

Figure 2



Compositional-genetic category

O - organic: peat and muck
C - colluvial: various materials
A - alluvial: gravel, sand, and silt
L - glaciolacustrine: clay, silt, and sand
G - glaciofluvial: silt, sand, and gravel
M - morainal: till
R - bedrock: various types

Morphologic category

p - plain, floodplain
h - hummocky
t - terraced
r - ridged
d - delta
b - blanket
v - veneer
x - complex

Other modifiers

c - channelled
s - solifluted
k - thermokarst

Geological boundary
Cirque
Drumlin, drumlinoid ridge, glacial fluting
Minor moraine; crevasse filling
Esker
Meltwater channel (major, minor)
Dunes

Klassen, R.W. and Morison, S.R.
1987: Surficial geology, Laberge, Yukon Territory;
Geological Survey of Canada,
Map 8-1985, scale 1:250 000

LEGEND

☆ - APPROXIMATE SITE LOCATION

0 5 000
Scale: 1: 100 000 (metres)

CLIENT
Yukon Government
Department of Community Services

HYDROGEOLOGICAL ASSESSMENT
DEEP CREEK WASTE DISPOSAL FACILITY, YUKON

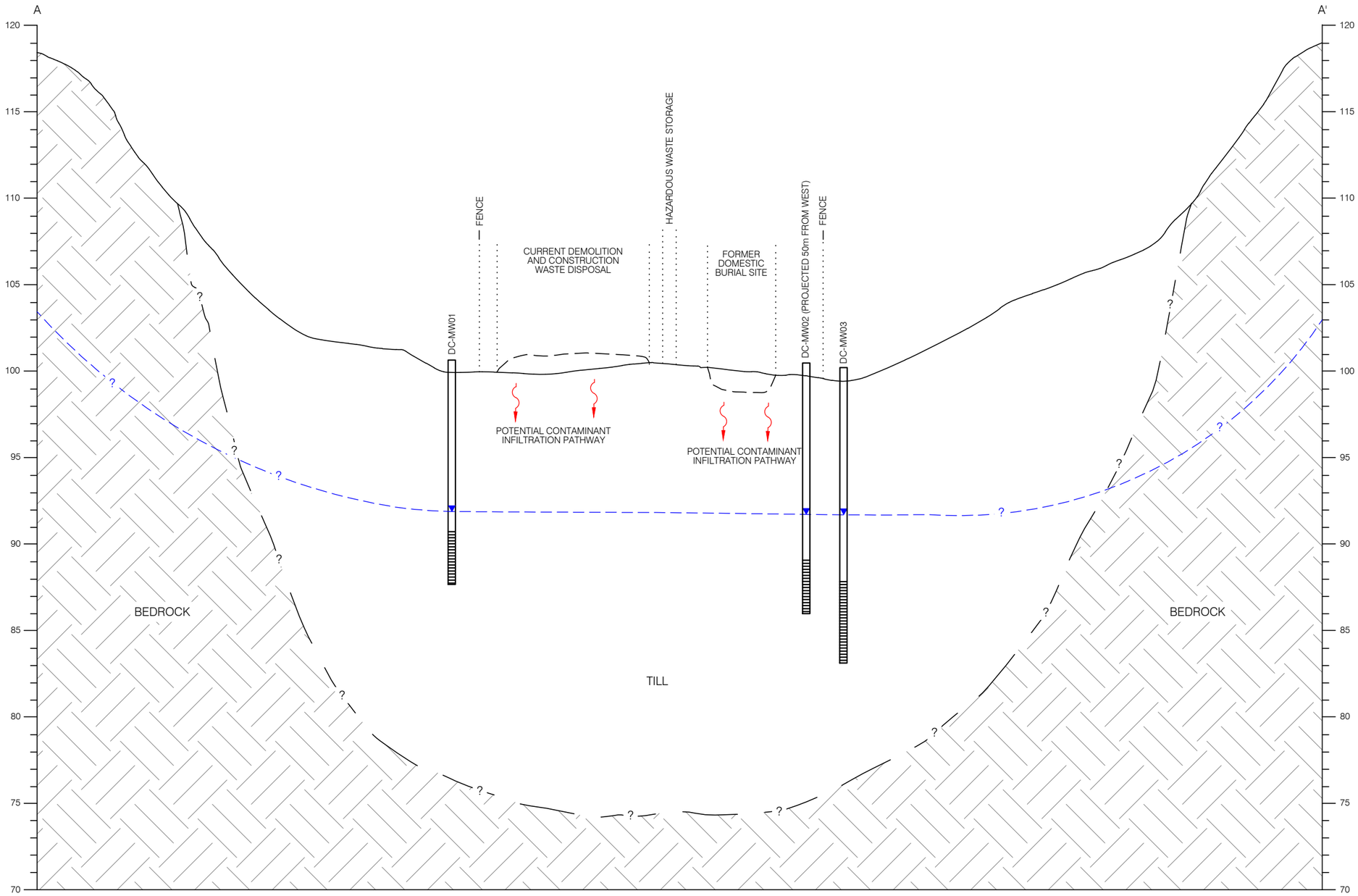
REGIONAL SURFACE GEOLOGY

eba A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W23101317.007	CB	AJS	0

OFFICE: EBA-WHSE
DATE: January 11, 2010

Figure 3



LEGEND

- MONITORING WELL

— — - GROUNDWATER ELEVATION

CLIENT

Yukon Government
Department of Community Services

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HYDROGEOLOGICAL ASSESSMENT
DEEP CREEK WASTE DISPOSAL FACILITY, YUKON

CONCEPTUAL HYDROGEOLOGICAL CROSS SECTION A - A'

PROJECT NO.	DWN	CKD	REV
W23101317.007	AJS	CB	0

OFFICE	DATE
EBA-WHSE	December 20, 2010

Figure 4

Q:\Whitehorse\Data\0201drawings\Deep Creek\W23101317.007 Hydro Assessment\W23101317.007 Fig.5_R0.dwg [FIGURE 5] December 21, 2010 - 10:03:32 am (BY: BUCHAN, CAMERON)

NOTE : THE IMAGE USED IN THIS PLAN WAS RECEIVED FROM YUKON GOVERNMENT DEPARTMENT OF ENERGY, MINES AND RESOURCES

LEGEND

- APPROXIMATE SITE LOCATION
- REGIONAL DRAINAGE LINES

0 5 000

Scale: 1: 100 000 (metres)

CLIENT

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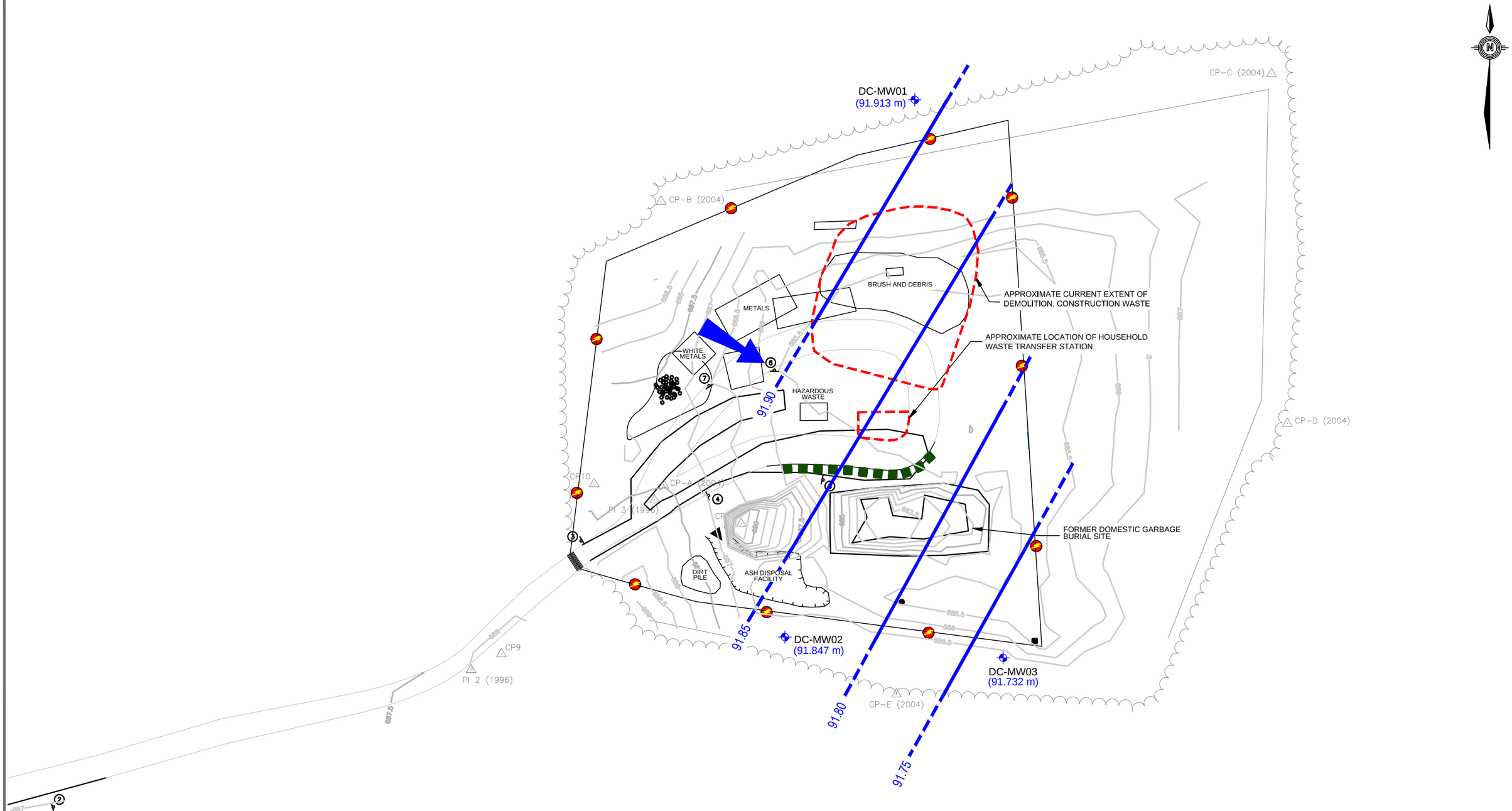
HYDROGEOLOGICAL ASSESSMENT
DEEP CREEK WASTE DISPOSAL FACILITY, YUKON

REGIONAL DRAINAGE

PROJECT NO.	DWN	CKD	REV
W23101317.007	CB	AJS	0

OFFICE	DATE
EBA-WHSE	December 20, 2010

Figure 5



LEGEND

- MONITORING WELL LOCATION
- 97.21 - GROUNDWATER ELEVATION CONTOUR
- INFERRED GROUNDWATER FLOW DIRECTION
- 687 - GROUND ELEVATION CONTOUR
- ELECTRIC FENCE
- (91.847 m) - GROUNDWATER ELEVATION (NOVEMBER 2010)

0 50

Scale: 1: 1000 (metres)

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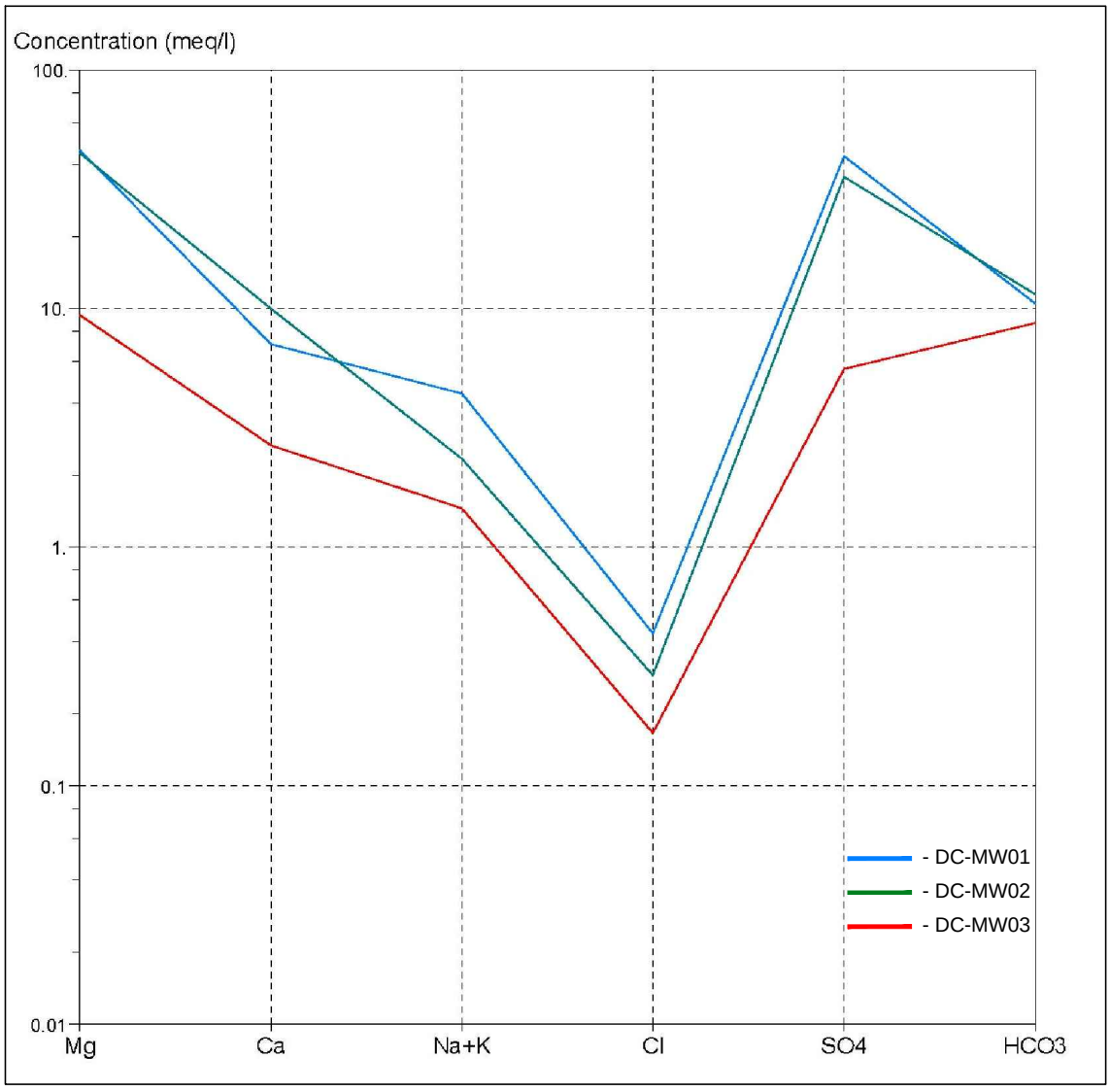
HYDROGEOLOGICAL ASSESSMENT
DEEP CREEK WASTE DISPOSAL FACILITY, YUKON

GROUNDWATER ELEVATION CONTOURS (NOVEMBER 2010)

PROJECT NO.	DWN	CKD	REV
W23101317.007	CB	AJS	0

OFFICE	DATE
EBA-WHSE	December 20, 2010

Figure 6



LEGEND

- DC-MW01
- DC-MW02
- DC-MW03

CLIENT

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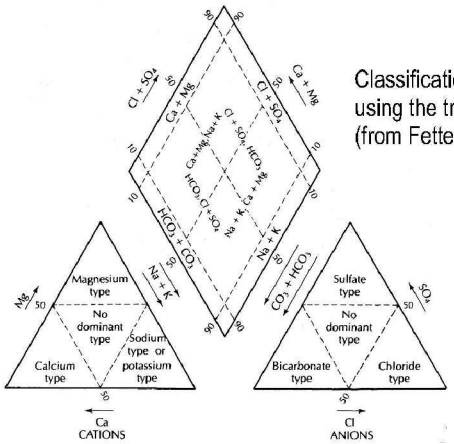
HYDROGEOLOGICAL ASSESSMENT
DEEP CREEK, YUKON

SCHOELLOR PLOT

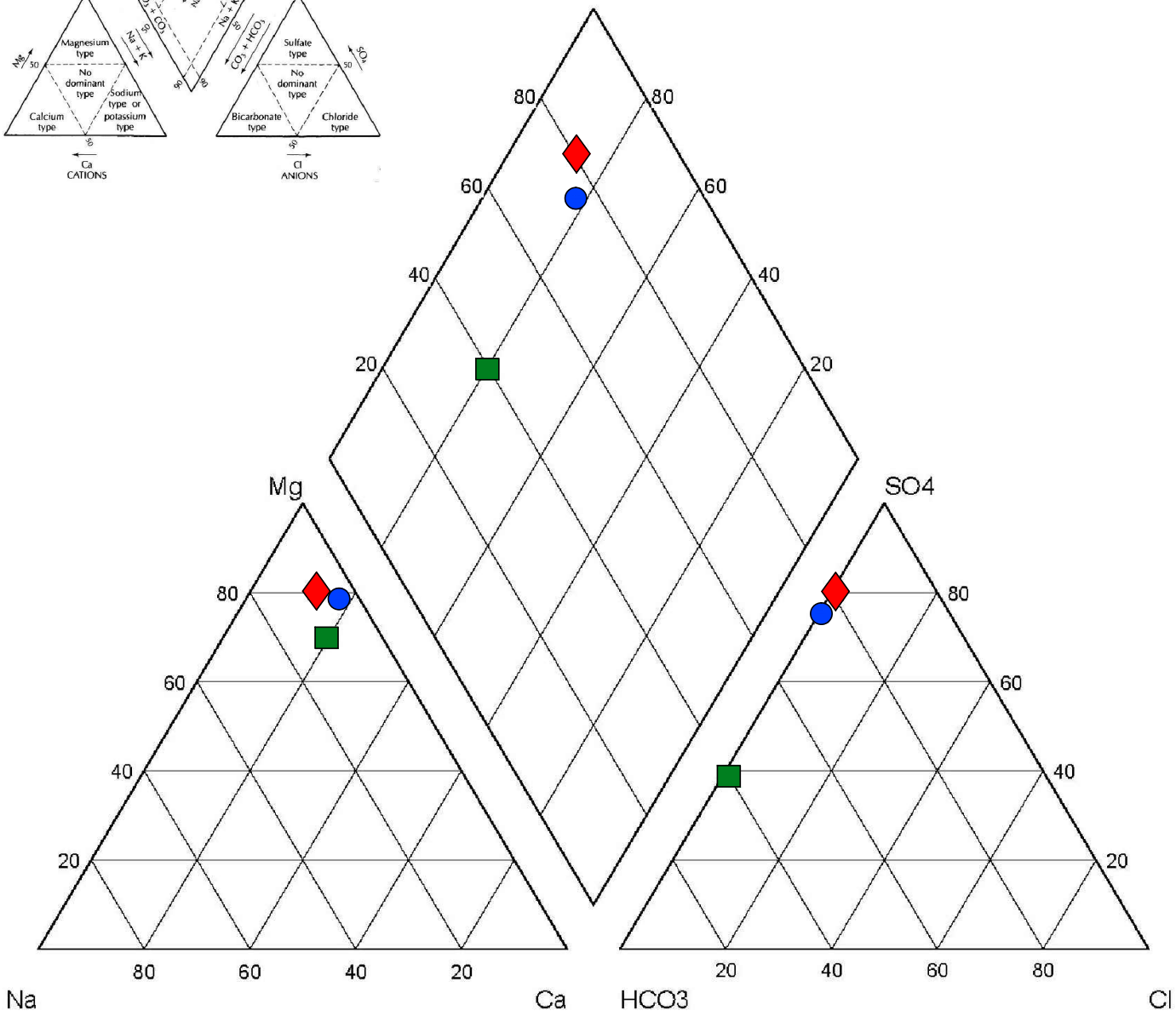
PROJECT NO.	DWN	CKD	REV
W23101317.007	CB	AJS	0

OFFICE	DATE
EBA-WHSE	December 20, 2010

Figure 7



Classification of hydrogeochemical water types
using the trilinear Piper diagram
(from Fetter, 2001)



LEGEND

- DC-MW01
- DC-MW02
- DC-MW03

CLIENT

Yukon Government
Department of Community Services

HYDROGEOLOGICAL ASSESSMENT
DEEP CREEK WASTE DISPOSAL FACILITY, YUKON

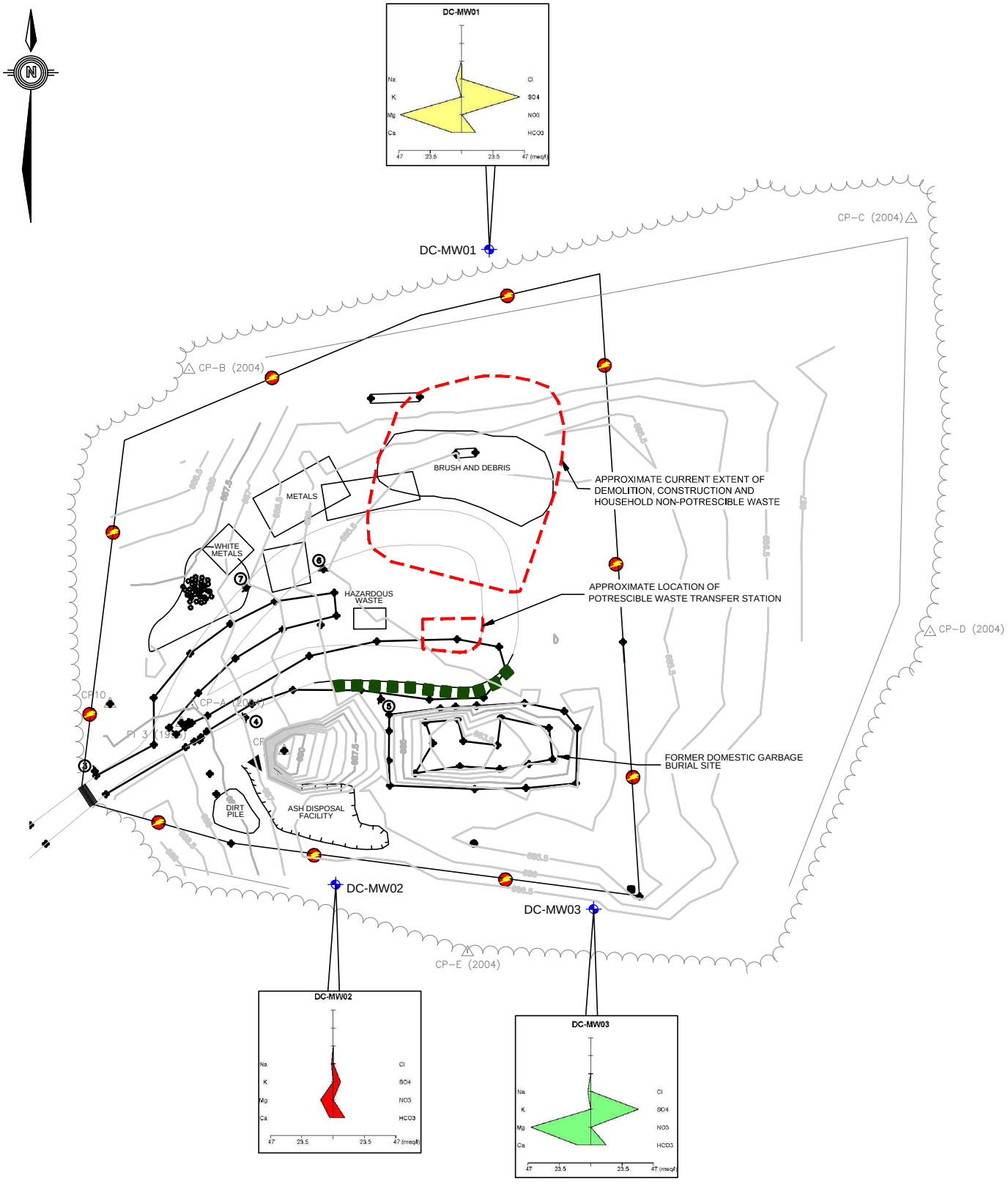
PIPER DIAGRAM

eba
A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	REV
W23101317.007	CB	AJS	0

OFFICE	DATE
EBA-WHSE	December 20, 2010

Figure 8



LEGEND

- MONITORING WELL

0 50

Scale: 1: 1 250 (metres)

CLIENT

Yukon Government
Department of Community Services

HYDROGEOLOGICAL ASSESSMENT
DEEP CREEK WASTE DISPOSAL FACILITY, YUKON

STIFF DIAGRAMS

eba
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PROJECT NO.	DWN	CKD	REV
W23101317.007	CB	AJS	0

OFFICE	DATE
EBA-WHSE	December 20, 2010

Figure 9

APPENDIX A

APPENDIX A 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.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

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.

APPENDIX B

APPENDIX B DEEP CREEK WASTE DISPOSAL FACILITY PERMIT

Yukon
Environment

Permit No: 80-009

WASTE DISPOSAL FACILITY PERMIT

Issued for the Operation of Waste Disposal Facilities Pursuant to
Part 6 of the *Environment Act*, s. 8 of the *Solid Waste Regulations*, s. 12 of the
Air Emissions Regulations, and s. 8 of the *Special Waste Regulations*

Permittee: Department of Community Services, Government of Yukon

Mailing Address: P.O. Box 2703 (C-9), Whitehorse, YT, Y1A 2C6

Site Locations: Waste disposal facilities listed in Schedule A

Phone/Fax: (867) 667-8684 / (867) 393-6216

Authorized Representative: Paul Moore

Email: paul.moore@gov.yk.ca

Effective Date: January 1, 2010

Expiry Date: December 31, 2011

Scope of Authorization: In accordance with your application, you are authorized to:

a. operate a waste disposal facility;
b. operate a special waste management facility for the acceptance, storage, and transportation of special waste generated by households, waste oil, waste batteries, waste paints, waste solvents, and waste fuels; and
c. open burn solid waste in an amount greater than 5 kilograms per day

at the above site locations (the "site" or "sites"), as set out in the terms and conditions of this permit.

Dated this ____ day of _____, 2010

_____
Director, Environmental Programs Branch
Environment Yukon

PART 1. GENERAL PROVISIONS

1.1 DEFINITIONS

1. In this permit,

"Act" means the *Environment Act*, R.S.Y. 2002, c. 76;

"approved plan" means a plan that is submitted by the permittee and approved by an environmental protection officer under this permit and includes any terms and conditions specified by the environmental protection officer in the approval;

"associated personnel" means all employees, contractors and volunteers involved in the permitted activities;

"Branch" means the Environmental Programs Branch, Environment Yukon;

"burning vessel" means a container or structure used for burning solid waste where air intake and combustion temperature are not controlled;

"cell" means a discrete area of a facility into which solid waste is deposited for permanent disposal and includes such areas that are no longer used for that purpose;

"dangerous wildlife" means wildlife so defined in the *Wildlife Act*, R.S.Y. 2002, c. 229;

"landfill" means a facility authorized to accept waste for final disposal, and does not include transfer stations or modified transfer stations;

"facility" means a special waste management facility and any of the following waste disposal facilities: a landfill, a modified transfer station, and a transfer station;

"groundwater receptor" means a well or receiving water body into which groundwater flows;

"head office" means the office of the permittee located in Yukon;

"listed special waste" means special waste generated by a household, waste oil, waste batteries, waste paints, waste solvents, and waste fuels;

"modified transfer station" means a waste disposal facility where construction and demolition waste and/or animal carcasses are permanently disposed on site and all other material is removed from the site for recycling or disposal at another location;

"Regulations" means the *Air Emissions Regulations*, O.I.C. 1998/207, the *Solid Waste Regulations*, O.I.C. 2000/11, and the *Special Waste Regulations*, O.I.C. 1995/047;

"service area" means the population that is anticipated to be served by a facility;

"texas gate" means an electrified metal grid on the ground that can be passed over by vehicles but will prevent entry by animals;

"transfer station" means a waste disposal facility where no solid waste is permanently disposed on site, and where all solid waste is removed from the site for recycling or disposal at another location;

"vehicle" has the same meaning as in the *Motor Vehicles Act*, R.S.Y. 2002, c. 153; and

"waste manifest" means the shipping document required to be completed by the permittee as set out in this permit in the form approved by an environmental protection officer.

2. Any term not defined in this permit that is defined in the Act or the Regulations has the same meaning as in the Act or the Regulations.

3. Schedule A forms part of this permit and may be amended in writing by an environmental protection officer from the Branch.

1.2 PLANS

1. The permittee shall develop and maintain a fire safety/emergency plan for each facility which includes notification procedures and a list of emergency phone numbers relevant to each site. All associated personnel involved with the handling or management of any wastes covered by this permit shall be familiar with this plan.

2. The permittee shall submit the following plans for approval no later than March 31, 2010:
   a) an open burning transition plan for each facility where open burning is authorized as set out in Schedule A, which plan shall detail how the permittee will phase out open burning at each site as soon as possible or by January 1, 2012 at the latest; and
   b) a plan for conducting hydrogeological assessments at each facility listed in Schedule A, which plan shall include timelines by which the hydrogeological assessment at each site will be completed.

3. The permittee shall submit the following plans for approval no later than June 30, 2010:
   a) a site inspection and maintenance plan for each facility; and
   b) a spill response plan for each facility.

4. For each facility constructed on permafrost, the permittee shall submit for approval a ground temperature monitoring plan for that facility with the hydrogeological assessment report. For those facilities not constructed on permafrost, the permittee shall submit a statement to that effect with the hydrogeological assessment report.

5. Prior to constructing a new cell at any facility, the permittee shall submit a new cell plan for approval.

6. No later than six months prior to the planned closure of a facility the permittee shall submit a facility closure plan for approval.

7. Prior to undertaking any work toward the partial or full closure of a cell, including progressive capping and reclamation of active cells, the permittee shall submit a cell closure plan for approval.

8. When the permittee is required to submit a plan under this permit, the permittee shall:
   a) ensure the plan meets the requirements for that type of plan as directed by an environmental protection officer from the Branch in writing;
   b) submit the plan in writing to an environmental protection officer from the Branch;
   c) not undertake any of the activities described in the plan until the plan is approved in writing by an environmental protection officer from the Branch; and
   d) implement the plan as of the date it is approved in writing by an environmental protection officer from the Branch.

9. If the permittee wants to amend an approved plan, the permittee shall submit the proposed amendment to an environmental protection officer from the Branch as if the amendment were a plan under paragraph 1.2.8 of this permit.

10. If an environmental protection officer from the Branch directs in writing and with reasons that an approved plan be amended, the permittee must prepare the required amendment and submit it as if it were a plan referred to in paragraph 1.2.8 of this permit.

1.3 RECORDS

1. The permittee shall keep all records required under this permit in a format acceptable to an environmental protection officer for a minimum of three years and make them available for inspection by an environmental protection officer upon request.

2. The permittee shall keep the following records at the head office:
   a) a copy of each plan submitted under this permit, and any amendments to and approvals of each plan;
   b) all inspections carried out for each facility under this permit (including the name of the person conducting the inspection, the date of each inspection, any observations recorded during the inspection, actions taken as a result of those observations, and the date each action was taken);
   c) results of surface water and groundwater testing conducted at each facility, where applicable (including interpretations of monitoring results to determine trends in contaminant levels over time);
   d) results of hydrogeological assessments undertaken at each facility;
   e) any spills or leaks occurring at any facility, including substance involved, estimated quantity, date of observation of the spill or leak, and clean-up procedures implemented;
   f) the types of special wastes segregated at each facility, their estimated volumes, and their storage location(s) at each facility;
   g) any and all deficiencies remedied in accordance with paragraph 1.4.4, and how and when they were remedied; and
   h) a copy of any waste manifests used to transport special wastes to or from the facilities.

3. The permittee shall permanently retain at the head office an updated, detailed site plan for each facility showing the locations of all active and closed cells and segregation

areas at the facility and shall produce this site plan upon request for inspection by an environmental protection officer.

1.4 OTHER

1. The permittee shall ensure that all associated personnel at each facility:
   a) have access to a copy of this permit;
   b) are knowledgeable of the terms and conditions of this permit; and
   c) receive the appropriate training for the purposes of carrying out the requirements of this permit.

2. The permittee shall provide notice in writing to an environmental protection officer from the Branch prior to any significant change of circumstances at the sites, including without limitation:
   a) closure of a facility;
   b) change of ownership of the site;
   c) the opening of a new cell;
   d) changing from a burn to a no-burn or from a no-burn to a burn operation; and
   e) change to the mailing address or phone number of the permittee.

3. Where conflicts exist between this permit, the permit application or any plans, this permit shall prevail.

4. If an inspection reveals that a facility is in any way not in compliance with this permit or approved plans, or that surface water run-off is negatively affecting the structure or physical integrity of a facility, the permittee shall repair the damage or take other actions as required to bring the facility into compliance.

PART 2. SOLID WASTE

2.1 OPERATIONS

1. The permittee shall not operate a landfill for a service area greater than 13,000 people.

2. The permittee shall ensure that all solid waste left at a facility that is not separated for recycling or transfer off-site is deposited into a cell.

3. The permittee shall ensure that all domestic waste left at a transfer station or modified transfer station is deposited into a transfer bin.

4. No solid waste shall be burned or buried at a transfer station.

5. The permittee shall ensure that the bottoms and sides of all transfer bins at transfer stations and modified transfer stations are sealed and maintained to prevent the release of solid waste into the natural environment.

6. The permittee shall divert surface water run-off away from any area of a facility where waste is stored or deposited.

7. The permittee shall ensure that animal carcasses and animal parts are buried at a landfill or modified transfer station at least 2 metres below the surface of the land. If animal carcasses or parts are discovered at a transfer station, the permittee shall ensure that they are immediately removed and transported to a landfill or modified transfer station.

2.2 SIGNAGE AND SEGREGATION

1. The permittee shall install and maintain signs at each facility containing the following information:
   a) entrance and exit location(s) for the facility; and
   b) telephone contact numbers for the facility manager, the local fire protection services, and the district conservation officer.

2. The permittee shall:
   a) establish and maintain separate areas for the deposit of each type of solid waste accepted at each facility;
   b) install and maintain appropriate signs identifying each of these areas; and
   c) ensure that each facility is maintained to enable vehicles to access each of these areas.

2.3 FENCING AND SECURITY

1. The permittee shall install and maintain, in accordance with the manufacturer's operating and maintenance instructions and recommendations, an electric exclusion fence(s) and gates that encompass the putrescibile waste disposal areas at each facility and any other areas of the facilities that become or may become an attractant to animals. The fence and gates shall be adequate to prevent dangerous wildlife from entering the encompassed areas of the facility.

2. The fences and gates referenced in paragraph 2.3.1 above must be:
   a) activated continuously from May 1 to October 31 of each year;
   b) activated between November 1 and April 30 of each year if there are tracks or other signs of dangerous wildlife attempting to access the facility; and
   c) activated upon the written request of an environmental protection officer.

3. For those facilities that are open to the public when staff are not on site, the permittee shall install and maintain a texas gate at each entrance and exit of each facility.

4. For those facilities that are closed to the public when staff are not on site, the permittee shall install and maintain either a texas gate or an electrified rigid swinging gate at each entrance and exit of each facility. Any rigid swinging gates are to be closed and secured every time staff leave the facility.

5. The permittee shall install and maintain fencing or other comparable measures at each facility to prevent the release of solid waste from the facility.

6. The permittee shall install and maintain signs marking the areas, if any, of each facility that are not to be accessed by the public and erect or construct fencing, gates or other similar structures to prevent public access to these areas.

2.4 WASTE COVER

1. At any facility where solid waste is burned or incinerated outside of a burning vessel or incinerator, the permittee shall cover burned solid waste:
   a) every month for facilities with service areas of 100 or more people; or
   b) every two months for facilities which with service areas of less than 100 people,
   with soil or other comparable material to a depth of 0.1 metres, or any other depth that an environmental protection officer considers necessary to prevent windblown solid waste and attraction of birds.

2. At any facility where solid waste is burned in a burning vessel or incinerated, when the permittee removes unburned solid waste and ash from the burning vessel or incinerator after burning, it shall be placed in a cell at the facility and immediately covered with soil or other comparable material to a depth of 0.1 metres, or any other depth that an environmental protection officer considers necessary to prevent windblown solid waste and attraction of birds.

3. At any facility where solid waste will not be burned or transferred off-site, the permittee shall cover any exposed solid waste with soil or other comparable material to a depth of 0.1 metres or any other depth that an environmental protection officer considers necessary to prevent windblown solid waste and attraction of birds:
   a) every day the facility is used if the facility has a service area of more than 5,000 people;
   b) every seven days if the facility has a service area of 500 to 5,000 people;
   c) every 21 days if the facility has a service area of less than 500 people; or
   d) after every 0.5 metres of solid waste is deposited,
   whichever occurs first.

4. Paragraphs 2.4.1, 2.4.3 and 2.4.3 do not apply between November 15 and April 15 of each year if soil or other comparable cover material cannot reasonably be obtained.

2.5 OPEN BURNING OF SOLID WASTE

1. The permittee shall ensure that solid wastes are only burned at those facilities where open burning is specifically authorized as set out in Schedule A.

2. At those facilities where open burning is permitted as set out in Schedule A , the permittee shall:

a) ensure, to the extent practicable, that solid waste to be open burned is dry and shall only burn wet solid waste when to delay such burning may result in attraction of animals or creation of a fire hazard;
b) prior to open burning the solid waste, separate combustible solid waste from any underlying grass or peat layer;
c) not allow solid waste to smoulder (burn and smoke without flame) during an open burn;
d) not use waste oil, tires or aviation gasoline to assist with the incineration of solid waste during an open burn;
e) not use any waste petroleum products to assist with the open burning of solid waste without prior approval to do so in writing by an environmental protection officer from the Branch;
f) prevent runoff water from entering the active open burning area; and
g) not open burn tires or treated wood products, including wood products that have been treated with creosote, chromium copper arsenate (CCA), pentachlorophenol (PCP), or any type of paint.

2.6 MONITORING

1. The permittee shall ensure that samples are taken from all active groundwater monitoring wells at each facility in accordance with protocols for groundwater sampling approved by the Branch. The water level in all monitoring wells shall be recorded at each sampling event. Samples shall be taken twice each year the permit is in effect, once in the spring and once in the late summer, or as otherwise directed in writing by an environmental protection officer.

2. The permittee shall ensure that samples are taken, using generally-accepted sampling practice, from all downgradient surface water bodies within 1 km of each facility that are identified in the hydrogeological assessment as being potentially impacted by the facility. Samples shall be taken concurrently with each groundwater sampling event or as otherwise directed in writing by an environmental protection officer.

3. All groundwater samples shall be analyzed for the following parameters:
   - Major ions (Calcium, Magnesium, Sodium, Potassium, Chloride, Sulphate, Nitrate Nitrogen, Nitrite Nitrogen, Phosphate)
   - Dissolved metals
   - Mercury
   - Hardness
   - Alkalinity
   - Carbonate
   - Bicarbonate
   - pH
   - Total dissolved solids
   - Ammonia
   - Dissolved organic carbon
   - Volatile organic compounds

- Chemical oxygen demand
- Total Kjeldahl nitrogen
- EPH_{W10-19} (Extractable Petroleum Hydrocarbons in Water, C10-C19)
- VH_{W6-10} (Volatile Petroleum Hydrocarbons in Water, C6-C10)
- BTEX (Benzene, Toluene, Ethylbenzene, and Total Xylenes)
- PAHs (Polycyclic Aromatic Hydrocarbons)
- Faecal coliforms (for those sites at which biosolids or liquids are deposited)

4. All surface water samples shall be analyzed for the following parameters:
   - Major ions (Calcium, Magnesium, Sodium, Potassium, Chloride, Sulphate, Nitrate Nitrogen, Nitrite Nitrogen, Phosphate)
   - Total metals
   - Mercury
   - Hardness
   - Alkalinity
   - Carbonate
   - Bicarbonate
   - pH
   - Total dissolved solids
   - Ammonia
   - Dissolved organic carbon
   - Chemical oxygen demand
   - Biochemical oxygen demand
   - Total Kjeldahl nitrogen
   - EPH_{W10-19} (Extractable Petroleum Hydrocarbons in Water, C10-C19)
   - VH_{W6-10} (Volatile Petroleum Hydrocarbons in Water, C6-C10)
   - BTEX (Benzene, Toluene, Ethylbenzene, and Total Xylenes)
   - PAHs (Polycyclic Aromatic Hydrocarbons)
   - Faecal coliforms (for those sites at which biosolids or liquids are deposited)

5. All water samples required by this permit shall be analyzed at a laboratory that is accredited as conforming to ISO/IEC 17025 by an accrediting body that conforms to ISO/IEC 17011.

6. The results of the analyses required under sections 2.6.3 and 2.6.4 shall be submitted to the Branch by January 31st of the year following that in which the samples were taken.

7. If water quality monitoring reveals that surface or groundwater downgradient of the facility contains contaminants in excess of the standards in the *Contaminated Sites Regulation*, the permittee shall conduct additional monitoring or develop and implement an adaptive management plan to address the contamination, as directed in writing by an environmental protection officer.

PART 3. SPECIAL WASTE

3.1 STORAGE AND HANDLING

1. The permittee shall not handle special wastes other than listed special wastes.

2. The permittee shall not discard, destroy, treat, process, incinerate, or recycle special wastes, except for mixing or dilution authorized by an environmental protection officer pursuant to section 3.1.3(k) below.

3. At facilities where special wastes are accepted, the permittee shall:
   a) cover or store out of inclement weather all drums and other portable containers containing special wastes;
   b) store all drums and other portable containers containing special wastes off the ground;
   c) immediately remove all special wastes stored in leaking containers or transfer them to intact containers;
   d) to the extent practicable, handle and store special wastes separately from solid waste;
   e) store special wastes in a manner that will prevent incompatible substances from reacting adversely with each other;
   f) post signs identifying examples of common special wastes and phone number(s) and/or website(s) with information on appropriate disposal options for those materials, whether or not those materials are collected onsite;
   g) ensure that all containers used for the storage of special waste are clearly marked to identify what special waste the container is intended to hold;
   h) ensure that containers used for the storage of special waste are made of materials that will not adversely react with the special waste;
   i) not allow any residue at the bottom of a container used for the storage of special wastes to be released to the environment. Such residue shall be collected by the permittee, separated from other waste and treated as a special waste until proven by testing to not be special waste;
   j) not mix waste oil from piston engine aircraft with other waste oil;
   k) only mix or dilute a special waste with any other material where such mixing or dilution is authorized by an environmental protection officer from the Branch as an acceptable treatment/disposal option for the special waste;
   l) keep all containers used to store special waste closed at all times during storage and shall not open, handle or store the container in a manner which may cause it to leak or rupture; and
   m) shall have every closed container that
      (i) has a capacity of more than 230 litres;
      (ii) is designed to be installed in a fixed location; and
      (iii) will contain special waste

      certified by a testing agency recognized by the Standards Council of Canada prior to putting special waste in the container.

3.2 TRANSPORT AND TRANSFER

1. The permittee shall complete a waste manifest documenting each shipment of special wastes from each site. The permittee shall distribute copies of the waste manifest in the manner described thereon.

2. The permittee shall ensure that special wastes are transported to a permitted special waste management facility in the Yukon or another jurisdiction by a carrier permitted in the Yukon to receive and transport the special wastes.

3. The permittee shall ensure that all vehicles operated by the permittee and carrying any special wastes are secured to prevent access by unauthorized persons.

I, **Paul Moore**, certify that I am an authorized representative of the **Department of Community Services**, and that I have read and understood the terms and conditions of this permit.

Paul Moore, Authorized Representative
Department of Community Services

Date

Schedule A: List of Permitted Waste Disposal Facilities

Table 1. Landfills

Site name	Location	Permitted to open burn solid waste
Beaver Creek	Reservation 115K07-038 140°50'17"W, 62°25'18"N	Yes, in burning vessel
Braeburn	Reservation 105E05-015 Lot 1063 Quad 105E/05, 86969 CLSR YT 135°45'34"W, 61°26'7"N	Yes, in burning vessel
Burwash Landing	Reservation 13462 138°53'4"W, 61°18'25"N	Yes, in burning vessel
Canyon	Lot 1042 Quad 115A/14, 85493 CLSR YT 137°9'21"W, 60°50'58"N	Yes, in burning vessel
Champagne	Reservation 115A16-007 Lot 1039 Quad 115A/16, 87076 CLSR YT 136°27'32"W, 60°47'25"N	Yes, in burning vessel
Johnson's Crossing	Lot 1040 Quad 105C/06, 86853 CLSR YT 133°17'9"W, 60°29'34"N	Yes, in burning vessel
Horsecamp Hill	Reservation 115K02-010 140°37'32"W, 62°2'50"N	Yes, in burning vessel
Keno City	135°19'18"W, 63°54'33"N	Yes, in burning vessel
Old Crow	Reservation 116O12-024 139°52'14"W, 67°34'9"N	Yes, in burning vessel
Pelly Crossing	Reservation 115I15-030 136°35'56"W, 62°46'18"N	Yes, in burning vessel
Ross River	Reservation 105F16-008 132°26'40"W, 61°57'44"N	Yes, in burning vessel
Silver City	Reservation 2007-0498 138°20'1"W, 61°1'25"N	Yes, in burning vessel
Stewart Crossing	Reservation 115P07-020 Lot 1026 Quad 115P/07, 86830 CLSR YT 136°39'33"W, 63°20'23"N	Yes, in burning vessel
Upper Liard	Reservation 105A02-120 Lot 1109 Quad 105A/02, 86882 CLSR YT 128°56'56"W 60°3'14"N	Yes, in burning vessel

Table 2. Modified Transfer Stations

Site name	Location	Permitted to open burn solid waste
Carcross	Kilometre 50.7 Tagish Road 134°40'25"W, 60°11'37"N	No
Deep Creek	Reservation 105E03-031 135°13'48"W, 61°4'56"N	No
Destruction Bay	Reservation 115G07-012 138°51'33"W, 61°17'25"N	No
Marsh Lake	Reservation 105D09-030 Lot 1061 Quad 105D/09, 86854 CLSR YT 134°25'46"W, 60°33'53"N	Yes, C&D waste without burning vessel
Mount Lorne	Reservation 770004 134°51'38"W, 60°28'41"N	No
Tagish	Lot 1100 Quad 105D/08 134°17'29"W, 60°16'28"N	No

Table 3. Transfer Stations

Site name	Location	Permitted to open burn solid waste
(N/A)		

APPENDIX C

APPENDIX C MONITORING WELL LOGS

2010 Monitoring Well Program	CLIENT: YG - Department of Community Services	BOREHOLE NO:
Deep Creek Landfill	DRILL: CME 75 HS Auger	W23101317-DC-MW01
Deep Creek, YT	6772098N; 487611E; Zone 8	PROJECT NO: W23101317

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	SAND - organics, fine grained sand, damp, dark brown			- cement seal from 0 to 0.3 m
1	SILT - some clay, uniformly graded, damp, firm, grey to light brown		G1	
2			G2	
3	- soft, damp, grey to light brown		G3	
4			G4	
5			G5	
6			G6	
7	- some fine grained sand, grey		G7	
8			G8	
9			G9	
10			G10	
11			G11	
12	- saturated, very soft - wet, soft		G12	
13			G13	
14			G14	
15	- saturated		G15	
	END OF BOREHOLE @ 15.2 m			
16	NOTE: Hole drilled to 15.2 m, collapsed to 12.2 m.			
17				
18				
19				
20				

Bulk Density(kg/m³): 500 1000 1500 2000

PLASTIC M.C. — LIQUID: 20 40 60 80

CLAY (%): 20 40 60 80

SILT (%): 20 40 60 80

SAND (%): 20 40 60 80

GRAVEL (%): 20 40 60 80

Monitoring well

Depth (ft): 0 5 10 15 20 25 30 35 40 45 50 55 60 65

EBA Engineering Consultants Ltd.	LOGGED BY: AJS	COMPLETION DEPTH: 15.2m
	REVIEWED BY: RMM	COMPLETE: 9/12/2010
	DRAWING NO:	Page 1 of 1

MGP W23101317.004.GPJ EBA.GDT 12/16/10

2010 Monitoring Well Program	CLIENT: YG - Department of Community Services	BOREHOLE NO:
Deep Creek Landfill	DRILL: CME 75 HS Auger	W23101317-DC-MW02
Deep Creek, YT	6771922N; 487605E; Zone 8	PROJECT NO: W23101317

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	SAND - some silt, uniformly graded, fine grained sand, dry to damp, loose, yellow brown			- cement seal from 0 to 0.3 m
1			G1	
2			G2	
3			G3	
4	SILT - some clay, uniformly graded, damp, soft, yellow brown		G4	
5	- damp		G5	
6	- brown and grey		G6	
7			G7	
8	- moist		G8	
9	SAND - some silt, uniformly graded, fine grained sand, moist, soft, grey brown SILT - some clay, uniformly graded, soft, moist, grey brown		G9	
10			G10	
11	- damp, firm, grey		G11	
12	- wet, very soft		G12	
13	- some sand, well graded, saturated, grey		G13	
14			G14	
15	END OF BOREHOLE @ 15.2 m		G15	
16	NOTE: Hole drilled to 15.2 m, collapsed to 14.5 m.			
17				
18				
19				
20				
21				
22				

Bulk Density(kg/m³) 500 1000 1500 2000

PLASTIC M.C. LIQUID 20 40 60 80

CLAY (%) 20 40 60 80

SILT (%) 20 40 60 80

SAND (%) 20 40 60 80

GRAVEL (%) 20 40 60 80

Monitoring well

Depth (ft): 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 72

EBA Engineering Consultants Ltd.

LOGGED BY: BW	COMPLETION DEPTH: 15.2m
REVIEWED BY: RMM	COMPLETE: 9/10/2010
DRAWING NO:	Page 1 of 1

2010 Monitoring Well Program	CLIENT: YG - Department of Community Services	PROJECT NO. - BOREHOLE NO.
Deep Creek Landfill	DRILL: CME 75 HS Auger	W23101317-DC-MW03
Deep Creek, YT	6771951N; 487680E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	NOTES & COMMENTS	Depth (ft)
0	SAND - some silt, uniformly graded, dry to damp, loose, yellow brown			- cement seal from 0 to 0.3 m	0
1			G1		
2	SILT - some clay, uniformly graded, moist, soft, yellow brown		G2		5
3			G3		10
4			G4		
5			G5		15
6	SAND - some silt, uniformly graded, damp, loose, yellow brown		G6		20
7	SILT - some clay, uniformly graded, wet, soft, grey and yellow brown		G7		
8	- all grey		G8		25
9			G9		30
10	- firm		G10		
11	- soft		G11		35
12			G12		40
13	- firm, moist - saturated		G13		
14			G14		45
15			G15		50
16	- some sand		G16		
17	SAND - some clay, some silt, very firm, damp to moist, light grey		G17		55
18			G18		60
19	END OF BOREHOLE @ 18.3 m NOTE: Hole drilled to 18.3 m, collapsed to 16.2 m.				
20					65
21					70
22					
23					75
24					80
25					82

Monitoring well

EBA Engineering Consultants Ltd.

LOGGED BY: BW	COMPLETION DEPTH: 18.3m
REVIEWED BY: RMM	COMPLETE: 9/11/2010
DRAWING NO:	Page 1 of 1

APPENDIX D

APPENDIX D GROUNDWATER WELL DEVELOPMENT LOGS

Groundwater Development and Purging/Sampling Sheet

☐ Development
☑ Purge/Sample

WELL NO.: DC - MW01
LOCATION: Deep Creek Landfill
WEATHER: Overcast
TEMPERATURE: -4°

JOB NO.: W23101317
COMPLETED BY: Fiona Ray
DATE: Nov. 15th 2010
TIME: 3:04

MONITORING WELL INFORMATION

Depth to Water Below Top of Casing: A 8.750 (metres)
Depth to Bottom of Well Below Top of Casing: B 12.70 (metres)
Diameter Standpipe: C 51 (mm)

One well volume:
(B-A)*2.0 = 8.90 litres -for a 51mm (2.0 inch) diameter well
(B-A)*1.1 = — litres -for a 38mm (1.5 inch) diameter well
Product Thickness: — (by probe or paste?)

EQUIPMENT LIST

pH and Temp. Meter: Model Hanna Serial No. — Calibration Buffers: ☑ 4 ☑ 7 ☐ 10
Conductivity Meter: Model Hanna Serial No. — Calibration Solutions: 1413 µS and —
Dissolved Oxygen Meter: Model — Serial No. —
Turbidity Meter: Model Hanna Serial No. —

Not calibrated for TDS

Pump:	☑	none	☐	Waterra	☐	Peristaltic	☐	Submersible
Bailer:	☐	none	☐	Stainless Steel	☐	Teflon	☑	PVC
Filter:	☑	none	☐	Waterra in-line	☐	Vacuum (disposal)	☐	Vacuum (re-usable)

WELL DEVELOPMENT/PURGING

Purge volume: Well vol x 3 volumes = 23.70 litres Method: hand bail
Flow Rate — L/min Volume: — Start: 5:30 Finish: 6:10
(water level)

TIME	VOLUME REMOVED (L)	~~ORG. VAP. (PPM)~~	TEMP (oC)	pH (UNITS)	COND. (uS/cm)	TURBIDITY (NTU)	~~DIS.O2 (mg/L) or %~~	REMARKS (colour, odour, sheen, brittle film, etc.)
5:47	7L	—	1.6°	7.58	3894	715	—	clear grey/brown, no sheen/odour
5:35	9L	—	2.4°	7.58	>3999	Laser	9.345	grey, turbid, no odour/sheen
5:46	18L	—	2.1°	7.57	3984	—	10.09	" " "
5:54	24L	—	1.8°	7.60	3888	—	10.46	" " "

Comments (Recovery rate, etc.):

SAMPLING Water Odour: ☑ no ☐ yes (describe) — Sheen ☑ no ☐ yes (describe) —
Turbidity: — NTU Clear: 1 2 3 4 5 6 7 8 9 10 Very Silty
or 1 – 10 relative scale (circle as appropriate):
Other:
NAPL Information (odour, colour, etc.)

BOTTLE				Size:	40ml	100mL	250mL	500mL	1L	2L	4L	Filtered		Preservatives
1	☐	Plastic	☑	Glass	3	—	—	—	1	—	—	☐ Yes	☑ No	BTEX
2	☐	Plastic	☑	Glass	—	—	—	—	1	—	—	☐ Yes	☑ No	—
3	☑	Plastic	☐	Glass	—	—	2	—	—	—	—	☐ Yes	☑ No	—
4	☑	Plastic	☐	Glass	—	—	1	—	—	—	—	☐ Yes	☑ No	HCL
5	☑	Plastic	☐	Glass	—	—	1	—	—	—	—	☐ Yes	☑ No	H_2SO_4
6	☑	Plastic	☐	Glass	—	—	—	1	—	—	—	☐ Yes	☑ No	—
7	☑	Plastic	☐	Glass	—	—	—	—	1	—	—	☐ Yes	☑ No	—
8	☐	Plastic	☐	Glass	—	—	—	—	—	—	—	☐ Yes	☐ No	

Groundwater Development and Purging/Sampling Sheet

☐ Development
☑ Purge/Sample

WELL NO.: DC-MW02
LOCATION: Deep Creek Landfill
WEATHER: ~~Cloudy~~ Overcast
TEMPERATURE: -8°C

JOB NO.: W2310317
COMPLETED BY: Elaine Ross
DATE: Nov. 15, 2010
TIME: 12:50 PM

MONITORING WELL INFORMATION

Depth to Water Below Top of Casing: A 9.497 (metres)
Depth to Bottom of Well Below Top of Casing: B 15.03 (metres)
Diameter Standpipe: C 51 (mm)

One well volume:
(B-A)*2.0 = 11.066 litres -for a 51mm (2.0 inch) diameter well
(B-A)*1.1 = — litres -for a 38mm (1.5 inch) diameter well
Product Thickness: — (by probe or paste?)

EQUIPMENT LIST

pH and Temp. Meter: Model Hanna Serial No. HI 1288 Calibration Buffers: ☑ 4 ☑ 7 ☐ 10
Conductivity Meter: Model Hanna Serial No. HI 1288 Calibration Solutions: 1413 µS and —
Dissolved Oxygen Meter: Model — Serial No. —
Turbidity Meter: Model Hanna Serial No. Imb.42
Not calibrated for TDS.

Pump:	☑ none	☐ Waterra	☐ Peristaltic	☐ Submersible	
Bailer:	☐ none	☐ Stainless Steel	☐ Teflon	☑ PVC	
Filter:	☑ none	☐ Waterra in-line	☐ Vacuum (disposal)	☐ Vacuum (re-usable)	

WELL DEVELOPMENT/PURGING

Purge volume: Well vol x 3 volumes = 33.198 litres Method: hand bail
Flow Rate — L/min Volume: 33L Start: 1:53 Finish: 2:50

TIME	VOLUME REMOVED (L)	~~ORG. VAP. (PPM)~~	TEMP (oC)	pH (UNITS)	COND. (uS/cm)	TURBIDITY (NTU)	~~DIS.02 (mg/L) or %~~	REMARKS (colour, odour, sheen, brittle film, etc.)
1:34	2L	—	3.1°	7.91	825	Lo Err	—	grey, no odour/sheen
2:00	11L	—	3.1°	7.74	1016	Lo Err	10.52e	turbid grey, no odour/sheen
2:10	22L	—	2.3°	7.70	1083	—	10.98	very turbid, darker grey
2:21	33L	—	2.8°	7.64	1180	—	10.69	

Comments (Recovery rate, etc.): Relatively fast recovery; limited drawdown

SAMPLING Water Odour: ☑ no ☐ yes (describe) — Sheen ☑ no ☐ yes (describe) —
Turbidity: — NTU
or 1 – 10 relative scale (circle as appropriate): Clear: 1 2 3 4 5 6 7 8 9 10 Very Silty
Other: /
NAPL Information (odour, colour, etc.)

BOTTLE				Size:	40ml	100mL	250mL	500mL	1L	2L	4L	Filtered		Preservatives
1	☐	Plastic	☑	Glass	3	—	—	—	—	—	—	☐ Yes	☑ No	BTEX
2	☐	Plastic	☑	Glass	—	—	—	—	1	—	—	☐ Yes	☑ No	—
3	☑	Plastic	☐	Glass	—	—	2	—	—	—	—	☐ Yes	☑ No	—
4	☑	Plastic	☐	Glass	—	—	1	—	—	—	—	☐ Yes	☑ No	HCL
5	☑	Plastic	☐	Glass	—	—	1	—	—	—	—	☐ Yes	☑ No	H_2SO_4
6	☑	Plastic	☐	Glass	—	—	—	1	—	—	—	☐ Yes	☑ No	—
7	☑	Plastic	☐	Glass	—	—	—	—	1	—	—	☐ Yes	☑ No	—
8	☐	Plastic	☐	Glass	—	—	—	—	—	—	—	☐ Yes	☐ No	

Groundwater Development and Purging/Sampling Sheet

☐ Development
☑ Purge/Sample

WELL NO.: DC-MW03
LOCATION: Deep Creek Landfill
WEATHER: cloudy, foggy, frosty
TEMPERATURE: -12°C

JOB NO.: W23101317
COMPLETED BY: Fiona Rou
DATE: Nov. 15th, 2010
TIME: 9:38 AM

MONITORING WELL INFORMATION

Depth to Water Below Top of Casing: A 8.445 (metres)
Depth to Bottom of Well Below Top of Casing: B 16.81 (metres)
Diameter Standpipe: C 51 (mm)

One well volume:
(B-A)*2.0 = 16.73 litres -for a 51mm (2.0 inch) diameter well
(B-A)*1.1 = — litres -for a 38mm (1.5 inch) diameter well
Product Thickness: — (by probe or paste?)

EQUIPMENT LIST

pH and Temp. Meter: Model Hanna Serial No. Multi #3 Calibration Buffers: ☑ 4 ☑ 7 ☐ 10
Conductivity Meter: Model Hanna Serial No. 11 Calibration Solutions: 1413 µS and —
Dissolved Oxygen Meter: Model — Serial No. —
Turbidity Meter: Model Hanna Serial No. Tmb #2
Not calibrated for TDS.

Pump:	☑ none	☐ Waterra	☐ Peristaltic	☐ Submersible	
Bailer:	☐ none	☐ Stainless Steel	☐ Teflon	☑ PVC	
Filter:	☑ none	☐ Waterra in-line	☐ Vacuum (disposal)	☐ Vacuum (re-usable)	

WELL DEVELOPMENT/PURGING

Purge volume: Well vol x 3 volumes = 50.19 litres Method: hand bail haha...
Flow Rate — L/min Volume: 50.0L Start: 11:12 Finish: 11:45

TIME	VOLUME REMOVED (L)	~~ORG. VAP. (PPM)~~	TEMP (oC)	pH (UNITS)	COND. (uS/cm)	TURBIDITY (NTU)	~~DISO2 (mg/L) or %~~ water level	REMARKS (colour, odour, sheen, brittle film, etc.)
10:40	2L		2.0°	7.54	2666	39.8	—	clear, no odour/sheen
11:20	16.5		2.7°	7.21	3285	576	8.501	greyish, no odour/sheen
11:31	33.0		2.2°	7.20	3361	Lab Err	8.485	tinted grey, no odour/sheen
11:43	50.0		2.3°	7.20	3410	Lab Err	8.475	" " "

Comments (Recovery rate, etc.): Very fast, no drawdown

SAMPLING Water Odour: ☑ no ☐ yes (describe) — Sheen ☑ no ☐ yes (describe) —
Turbidity: ____ NTU
or 1 – 10 relative scale (circle as appropriate): Clear: 1 2 3 4 5 6 7 8 9 10 Very Silty
Other: Duplicates were taken at this well called DC-QC02 & DC-QC03.
NAPL Information (odour, colour, etc.)

BOTTLE				Size:	40ml	100mL	250mL	500mL	1L	2L	4L	Filtered		Preservatives
1	☐	Plastic	☑	Glass	—	—	—	—	1	—	—	☐ Yes	☑ No	—
2	☐	Plastic	☑	Glass	6	—	—	—	—	—	—	☐ Yes	☑ No	BTEX
3	☑	Plastic	☐	Glass	—	—	2	—	—	—	—	☐ Yes	☑ No	—
4	☑	Plastic	☐	Glass	—	—	1	—	—	—	—	☐ Yes	☑ No	HCL
5	☑	Plastic	☐	Glass	—	—	1	—	—	—	—	☐ Yes	☑ No	H_2SO_4
6	☑	Plastic	☐	Glass	—	—	—	1	—	—	—	☐ Yes	☑ No	—
7	☑	Plastic	☐	Glass	—	—	—	—	1	—	—	☐ Yes	☑ No	—
8	☐	Plastic	☐	Glass	—	—	—	—	—	—	—	☐ Yes	☐ No	

APPENDIX E

APPENDIX E GROUNDWATER SAMPLING FIELD SHEETS

Groundwater Development and Purging/Sampling Sheet

☑ Development
☐ Purge/Sample

WELL NO.: DC-MW01 | JOB NO.: W2310317.004
LOCATION: Deep Creek | COMPLETED BY: AJJ
WEATHER: Fine | DATE: 12/9/10
TEMPERATURE: 18°C | TIME: 6:00pm

MONITORING WELL INFORMATION

One well volume:

Depth to Water Below Top of Casing: A 8.95 (metres) 3.68 ×4.5 (B-A)*2.0 = 16.5 litres -for a 51mm (2.0 inch) diameter well
Depth to Bottom of Well Below Top of Casing: B 12.63 (metres) (B-A)*1.1 = — litres -for a 38mm (1.5 inch) diameter well
Diameter Standpipe: C 50 (mm) Product Thickness: nil (by probe or paste?)

EQUIPMENT LIST

pH and Temp. Meter: Model EBA 42 Serial No. — Calibration Buffers: ☑ 4 ☑ 7 ☐ 10
Conductivity Meter: Model EBA 02 Serial No. — Calibration Solutions: 0 and 1412
Dissolved Oxygen Meter: Model EBA 02 Serial No. —
Turbidity Meter: Model — Serial No. —

Pump: ☐ none ☑ Waterra ☐ Peristaltic ☐ Submersible
Bailer: ☐ none ☐ Stainless Steel ☐ Teflon ☐ PVC
Filter: ☐ none ☐ Waterra in-line ☐ Vacuum (disposal) ☐ Vacuum (re-usable)

WELL DEVELOPMENT/PURGING

Purge volume: Well vol x 1 volumes = 16.5 litres Method: Waterra
Flow Rate ~1.5 L/min Volume: ~51 Start: 8 Finish: 8:30

TIME	VOLUME REMOVED (L)	ORG. VAP. (PPM)	TEMP (oC)	pH (UNITS)	COND. (uS/cm)	TURBIDITY (NTU)	DIS.02 (mg/L) or %	REMARKS (colour, odour, sheen, brittle film, etc.)
8:00	1	—	6.6	7.1	3200	996	1.5	grey, turbid, no odour
8:11	17	—	5.0	7.1	3500	1072	1.7	" " "
8:20	34	—	4.7	7.1	3400	1127	1.7	" " "
8:30	51	—	4.6	7.1	3400	1155	1.7	" " "
	Left site, almost dark							

Comments (Recovery rate, etc.):

SAMPLING Water Odour: ☐ no ☐ yes (describe) _____ Sheen ☐ no ☐ yes (describe) _____

Turbidity: _____ NTU Clear: 1 2 3 4 5 6 7 8 9 10 Very Silty
or 1 – 10 relative scale (circle as appropriate):

Other:

NAPL Information (odour, colour, etc.)

BOTTLE					Size:	40ml	100mL	250mL	500mL	1L	2L	4L	Filtered		Preservatives
1	☐	Plastic	☐	Glass									☐ Yes	☐ No	
2	☐	Plastic	☐	Glass									☐ Yes	☐ No	
3	☐	Plastic	☐	Glass									☐ Yes	☐ No	
4	☐	Plastic	☐	Glass									☐ Yes	☐ No	
5	☐	Plastic	☐	Glass									☐ Yes	☐ No	
6	☐	Plastic	☐	Glass									☐ Yes	☐ No	
7	☐	Plastic	☐	Glass									☐ Yes	☐ No	
8	☐	Plastic	☐	Glass									☐ Yes	☐ No	

Groundwater Development and Purging/Sampling Sheet

☑ Development
☐ Purge/Sample

WELL NO.: MW02 | JOB NO.: W2310317
LOCATION: Deep Creek | COMPLETED BY: Adam Breaking
WEATHER: cloudy | DATE: Sept 11, 2010
TEMPERATURE: 10° | TIME: 8:45 am

MONITORING WELL INFORMATION

Depth to Water Below Top of Casing: A 9.55 (metres)
Depth to Bottom of Well Below Top of Casing: B 15.7 (metres)
Diameter Standpipe: 2" C 50 (mm)

One well volume:
(B-A)*~~2.0~~ 4.5 = 27.7 litres -for a 51mm (2.0 inch) diameter well
(B-A)*1.1 = — litres -for a 38mm (1.5 inch) diameter well
Product Thickness: nil (by probe or paste?)

EQUIPMENT LIST

pH and Temp. Meter: Model EBA #2 Serial No. — Calibration Buffers: ☑ 4 ☑ 7 ☐ 10
Conductivity Meter: Model EBA #2 Serial No. — Calibration Solutions: 0 and 1412
Dissolved Oxygen Meter: Model EBA #2 Serial No. —
Turbidity Meter: Model — Serial No. —

Pump: ☐ none ☐ Waterra ☐ Peristaltic ☐ Submersible
Bailer: ☑ none ☐ Stainless Steel ☐ Teflon ☐ PVC
Filter: ☐ none ☐ Waterra in-line ☐ Vacuum (disposal) ☐ Vacuum (re-usable)

WELL DEVELOPMENT/PURGING

Purge volume: Well vol x 1 volumes = 27 litres Method: Bail
Flow Rate ~ 1-2 L/min Volume: 107 Start: 8:50 Finish: 10:50

TIME	VOLUME REMOVED (L)	ORG. VAP. (PPM)	TEMP (oC)	pH (UNITS)	COND. (uS/cm)	TURBIDITY (NTU)	DIS.02 (mg/L) or %	REMARKS (colour, odour, sheen, brittle film, etc.)
8:50	1L	–	3.8°c	7.10	2150	9.59	18.34	clear, no odour
9:10	27L	–	2.9°c	7.10	1973	9.59	7.47	murky, grey, no odour
9:35	54	–	2.9	7.10	2100	9.59	7.9	turbid, grey, no odour
10:00	81	–	3.7	7.1	2000	9.59	4.2	" " "
10:30	107	–	4.3	7.1	2100	9.59	5.2	

Depth
→ slightly cloudy

Comments (Recovery rate, etc.): Good

SAMPLING Water Odour: ☐ no ☐ yes (describe) _____ Sheen ☐ no ☐ yes (describe) _____
Turbidity: _____ NTU Clear: 1 2 3 4 5 6 7 8 9 10 Very Silty
or 1 – 10 relative scale (circle as appropriate):
Other:
NAPL Information (odour, colour, etc.)

BOTTLE				Size:	40ml	100mL	250mL	500mL	1L	2L	4L	Filtered		Preservatives
1	☐	Plastic	☐ Glass		—	—	—	—	—	—	—	☐ Yes	☐ No	
2	☐	Plastic	☐ Glass		—	—	—	—	—	—	—	☐ Yes	☐ No	
3	☐	Plastic	☐ Glass		—	—	—	—	—	—	—	☐ Yes	☐ No	
4	☐	Plastic	☐ Glass		—	—	—	—	—	—	—	☐ Yes	☐ No	
5	☐	Plastic	☐ Glass		—	—	—	—	—	—	—	☐ Yes	☐ No	
6	☐	Plastic	☐ Glass		—	—	—	—	—	—	—	☐ Yes	☐ No	
7	☐	Plastic	☐ Glass		—	—	—	—	—	—	—	☐ Yes	☐ No	
8	☐	Plastic	☐ Glass		—	—	—	—	—	—	—	☐ Yes	☐ No	

6.15 × 4.5 = 27.7

Groundwater Development and Purging/Sampling Sheet

☑ Development
☐ Purge/Sample

WELL NO.: DC-MW03
LOCATION: Deep Creek
WEATHER: Cloudy
TEMPERATURE: 8°C

JOB NO.: W23101317.004
COMPLETED BY: AJJ
DATE: 12/9/10
TIME: 9-10.30

MONITORING WELL INFORMATION

Depth to Water Below Top of Casing: A 8.98 (metres)
Depth to Bottom of Well Below Top of Casing: B 16.80 (metres)
Diameter Standpipe: C 50 (mm)

One well volume:
(B-A)*2.0 = 35 litres -for a 51mm (2.0 inch) diameter well
(B-A)*1.1 = ____ litres -for a 38mm (1.5 inch) diameter well
Product Thickness: nil (by probe or paste?)

EQUIPMENT LIST

pH and Temp. Meter: Model EBA 42 Serial No. ____ Calibration Buffers: ☑ 4 ☑ 7 ☐ 10
Conductivity Meter: Model EBA #2 Serial No. ____ Calibration Solutions: 0 and 1412
Dissolved Oxygen Meter: Model EBA #2 Serial No. ____
Turbidity Meter: Model – Serial No. ____

Pump: ☐ none ☑ Waterra ☐ Peristaltic ☐ Submersible
Bailer: ☐ none ☐ Stainless Steel ☐ Teflon ☐ PVC
Filter: ☐ none ☐ Waterra in-line ☐ Vacuum (disposal) ☐ Vacuum (re-usable)

WELL DEVELOPMENT/PURGING

Purge volume: Well vol x 3 volumes = 105 litres Method: Handbail
Flow Rate 4 – 5 L/min Volume: 120 Start: 9:00 Finish: 10.30

TIME	VOLUME REMOVED (L)	ORG. VAP. (PPM)	TEMP (oC)	pH (UNITS)	COND. (uS/cm)	TURBIDITY (NTU) Depth	DIS.02 (mg/L) or %	REMARKS (colour, odour, sheen, brittle film, etc.)
9.00	1	–	4.3	7.1	3200		2.02	Grey, turbid, no odour or sheen
	20	–	4.2	7.1	3600	8.58	1.9	" " " "
	40	–	4.0	7.1	3600	8.58	1.9	" " " "
9.45	60	–	4.3	7.1	3700	8.58	1.9	" " " "
	80	–	4.3	7.1	3700	8.58	1.8	" " " "
	100	–	4.2	7.1	3600	8.58	1.9	" " " "
10.30	120	–	4.1	7.1	3600	8.58	1.5	" " " "

Comments (Recovery rate, etc.):

SAMPLING Water Odour: ☐ no ☐ yes (describe) ____ Sheen ☐ no ☐ yes (describe) ____
Turbidity: ____ NTU Clear: 1 2 3 4 5 6 7 8 9 10 Very Silty
or 1 – 10 relative scale (circle as appropriate):
Other:
NAPL Information (odour, colour, etc.)

BOTTLE					Size:	40ml	100mL	250mL	500mL	1L	2L	4L	Filtered		Preservatives
1	☐	Plastic	☐	Glass									☐ Yes	☐ No	
2	☐	Plastic	☐	Glass									☐ Yes	☐ No	
3	☐	Plastic	☐	Glass									☐ Yes	☐ No	
4	☐	Plastic	☐	Glass									☐ Yes	☐ No	
5	☐	Plastic	☐	Glass									☐ Yes	☐ No	
6	☐	Plastic	☐	Glass									☐ Yes	☐ No	
7	☐	Plastic	☐	Glass									☐ Yes	☐ No	
8	☐	Plastic	☐	Glass									☐ Yes	☐ No	

APPENDIX F

APPENDIX F LABORATORY ANALYTICAL RESULTS

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Report Transmission Cover Page

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Contact & Affiliation	Address	Delivery Commitments
Adam Seeley EBA Engineering Consultants Ltd -	Unit 6, 151 Industrial Road Whitehorse, Yukon Territory Y1A 2V3 Phone: (867) 668-3068 Fax: (867) 668-4349 Email: aseeley@eba.ca	On [Lot Verification] send (COA) by Email - Merge Reports On [Report Approval] send (Test Report) by Email - Multiple Reports On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Report Approval] send (Test Report) by Email - Single Report On [Report Approval] send (Test Report) by Email - Multiple Reports On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Report Approval] send (Test Report) by Email - Single Report On [Report Approval] send (Test Report) by Email - Multiple Reports On [Report Approval] send (Test Report) by Email - Multiple Reports On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Report Approval] send (Test Report) by Email - Single Report On [Report Approval] send (Test Report) by Email - Multiple Reports On [Report Approval] send (Test Report) by Email - Multiple Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Merge Reports

Notes To Clients:

- Report was re-issued to include missing TDS analysis on sample 774941-3. Report 1393593 replaces original report 1388991.
- Report was issued to include results for nitrate and nitrite separately on samples 774941-1, 2 and 3 requested by Adam Seeley of EBA on Dec. 8/10. Report 1394856 is the 2nd addendum to report 1388991.

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Report Transmission Cover Page

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
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Report Number:	1394856

Contact & Affiliation | Address | Delivery Commitments

- pH analysis was performed past the recommended holding time of 15 minutes from sample collection.

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Sample Custody

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Sample Disposal Date: March 07, 2011

All samples will be stored until this date unless other instructions are received. Please indicate other requirements below and return this form to the address or fax number on the top of this page.

☐ Extend Sample Storage Until _____ (MM/DD/YY)

The following charges apply to extended sample storage:

Storage for an additional 30 days	$ 2.50 per sample
Storage for an additional 60 days	$ 5.00 per sample
Storage for an additional 90 days	$ 7.50 per sample

☐ Return Sample, collect, to the address below via:

- ☐ Greyhound
- ☐ DHL
- ☐ Purolator
- ☐ Other (specify) _____

Name _____
Company _____
Address _____
_____
Phone _____
Fax _____

Signature _____

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Analytical Report

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

		Reference Number	774941-1	774941-2	774941-3
		Sample Date	Nov 15, 2010	Nov 15, 2010	Nov 15, 2010
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Deep Creek / DC-MW01	Deep Creek / DC-MW02	Deep Creek / DC-MW03
		Matrix	Water	Water	Water
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Aggregate Organic Constituents						
Chemical Oxygen Demand		mg O2/L	88	22	13	5
Inorganic Nonmetallic Parameters						
Ammonium - N		mg/L	0.32	0.08	0.05	0.05
Kjeldahl Nitrogen	Total	mg/L	2.1	0.58	0.71	0.06
Phosphorus	Total	mg/L	9.31	2.45	0.96	0.05
Orthophosphate-P	Dissolved	mg/L	0.09	0.08	0.09	0.01
Organic Carbon	Dissolved Nonpurgeable	mg/L	14.2	5.7	4.0	0.5
Metals Dissolved						
Sulfur	Dissolved	mg/L	660	78.2	553	0.2
Physical and Aggregate Properties						
Solids	Total Dissolved	mg/L	4060	814	3540	5
Routine Water						
Nitrate - N		mg/L	<0.05	<0.01	<0.05	0.01
Nitrite - N		mg/L	<0.02	<0.005	<0.02	0.005
Nitrate and Nitrite - N		mg/L	<0.07	<0.01	<0.07	0.01
pH	@ 25 °C		7.67	7.75		
Calcium	Dissolved	mg/L	142	53.4	200	0.1
Magnesium	Dissolved	mg/L	560	114	454	0.1
Phosphorus	Dissolved	mg/L	0.02	0.01	0.01	0.01
Potassium	Dissolved	mg/L	4.8	2.3	3.3	0.1
Silicon	Dissolved	mg/L	5.63	6.61	6.73	0.05
Sodium	Dissolved	mg/L	98.3	32.0	52.0	0.1
Bicarbonate		mg/L	640	530		5
Carbonate		mg/L	<6	<6		6
Hydroxide		mg/L	<5	<5		5
T-Alkalinity	as CaCO3	mg/L	529	438		5
Chloride	Dissolved	mg/L	15.4	5.89	10.3	0.02
Sulfate (SO4)	Dissolved	mg/L	2090	268	1710	0.05
Hardness	as CaCO3	mg/L	2660	603	2370	5
Salinity	Dissolved	g/L	0.248	0.0806	0.131	0.0001
Volatile Petroleum Hydrocarbons - Water						
VHw6-10		ug/L	<50	<50	<50	50
VPHw (VHw6-10 minus BTEX)		ug/L	<50	<50	<50	50
Extractable Petroleum Hydrocarbons - Water						
LEPHw		ug/L	100	<100	<100	100

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Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Reference Number	774941-1	774941-2	774941-3
Sample Date	Nov 15, 2010	Nov 15, 2010	Nov 15, 2010
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Deep Creek / DC-MW01	Deep Creek / DC-MW02	Deep Creek / DC-MW03
Matrix	Water	Water	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Extractable Petroleum Hydrocarbons - Water - Continued						
HEPHw		ug/L	<100	<100	<100	100
Polycyclic Aromatic Hydrocarbons - Water						
Acenaphthene		ug/L	<0.1	<0.1	<0.1	0.1
Acenaphthylene		ug/L	<0.1	<0.1	<0.1	0.1
Acridine		ug/L	<0.05	<0.05	<0.05	0.05
Anthracene		ug/L	<0.1	<0.1	<0.1	0.1
Benzo(a)anthracene		ug/L	<0.01	<0.01	<0.01	0.01
Benzo(a)pyrene		ug/L	<0.01	<0.01	<0.01	0.01
Benzo(b)fluoranthene		ug/L	<0.01	<0.01	<0.01	0.01
Benzo(g,h,i)perylene		ug/L	<0.1	<0.1	<0.1	0.1
Benzo(k)fluoranthene		ug/L	<0.02	<0.02	<0.02	0.02
Chrysene		ug/L	<0.1	<0.1	<0.1	0.1
Dibenzo(a,h)anthracene		ug/L	<0.01	<0.01	<0.01	0.01
Fluoranthene		ug/L	<0.1	<0.1	<0.1	0.1
Fluorene		ug/L	<0.1	<0.1	<0.1	0.1
Indeno(1,2,3-c,d)pyrene		ug/L	<0.1	<0.1	<0.1	0.1
Naphthalene		ug/L	<0.1	<0.1	<0.1	0.1
Phenanthrene		ug/L	<0.1	<0.1	<0.1	0.1
Pyrene		ug/L	<0.02	<0.02	<0.02	0.02
Quinoline		ug/L	<3.4	<3.4	<3.4	3.4
PAH - Water - Surrogate Recovery						
2-Fluorobiphenyl	PAH - Surrogate	%	90	88	87	30-130
Nitrobenzene-d5	PAH - Surrogate	%	102	81	82	23-130
p-Terphenyl-d14	PAH - Surrogate	%	94	93	86	18-137
VOC Screen - Water						
Benzene		ug/L	<1	<1	<1	1
Bromodichloromethane		ug/L	<1	<1	<1	1
Bromoform		ug/L	<1	<1	<1	1
Bromomethane		ug/L	<10	<10	<10	10
Carbon Tetrachloride		ug/L	<1	<1	<1	1
Chlorobenzene		ug/L	<1	<1	<1	1
Chloroethane		ug/L	<10	<10	<10	10
2-Chloroethyl Vinyl Ether		ug/L	<1	<1	<1	1
Chloroform		ug/L	<1	<1	<1	1
Chloromethane		ug/L	<10	<10	<10	10
Dibromochloromethane		ug/L	<1	<1	<1	1

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Analytical Report

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

	Reference Number	774941-1	774941-2	774941-3	
	Sample Date	Nov 15, 2010	Nov 15, 2010	Nov 15, 2010	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	Deep Creek / DC-MW01	Deep Creek / DC-MW02	Deep Creek / DC-MW03	
	Matrix	Water	Water	Water	
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
VOC Screen - Water - Continued						
1,2-Dichlorobenzene		ug/L	<1	<1	<1	1
1,3-Dichlorobenzene		ug/L	<1	<1	<1	1
1,4-Dichlorobenzene		ug/L	<1	<1	<1	1
1,1-Dichloroethane		ug/L	<1	<1	<1	1
1,2-Dichloroethane		ug/L	<1	<1	<1	1
1,1-Dichloroethene		ug/L	<1	<1	<1	1
1,2-Dichloroethene(cis)		ug/L	<1	<1	<1	1
1,2-Dichloroethene(trans)		ug/L	<1	<1	<1	1
1,2-Dichloropropane		ug/L	<1	<1	<1	1
1,3-Dichloropropene(cis)		ug/L	<1	<1	<1	1
1,3-Dichloropropene(trans)		ug/L	<1	<1	<1	1
Ethylbenzene		ug/L	<1	<1	<1	1
Methylene Chloride		ug/L	<5	<5	<5	5
Styrene		ug/L	<1	<1	<1	1
1,1,2,2-Tetrachloroethane		ug/L	<1	<1	<1	1
Tetrachloroethene		ug/L	<1	<1	<1	1
Toluene		ug/L	<1	<1	<1	1
1,1,1-Trichloroethane		ug/L	<1	<1	<1	1
1,1,2-Trichloroethane		ug/L	<1	<1	<1	1
Trichloroethene		ug/L	<1	<1	<1	1
Trichlorofluoromethane		ug/L	<1	<1	<1	1
Vinyl Chloride		ug/L	<2	<2	<2	2
Xylene-m&p		ug/L	2	<1	<1	1
Xylene-o		ug/L	2	<1	<1	1
Total Xylenes (m,p,o)		ug/L	4	<1	<1	1
VOC - Water - Surrogate Recovery						
Dibromofluoromethane	EPA Surrogate	%	112	112	111	86-118
Toluene-d8	EPA Surrogate	%	101	103	98	85-115
Bromofluorobenzene	EPA Surrogate	%	108	112	109	86-115
Trace Metals Dissolved						
Aluminum	Dissolved	µg/L	<5	<5	<5	5
Antimony	Dissolved	µg/L	0.6	<0.2	<0.2	0.2
Arsenic	Dissolved	µg/L	9.1	7.7	9.2	0.2
Barium	Dissolved	µg/L	23	39	11	1
Beryllium	Dissolved	µg/L	<0.04	<0.04	<0.04	0.04
Bismuth	Dissolved	µg/L	<1	<1	<1	1

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Analytical Report

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Reference Number	774941-1	774941-2	774941-3
Sample Date	Nov 15, 2010	Nov 15, 2010	Nov 15, 2010
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Deep Creek / DC-MW01	Deep Creek / DC-MW02	Deep Creek / DC-MW03
Matrix	Water	Water	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Trace Metals Dissolved - Continued						
Boron	Dissolved	µg/L	33	25	12	4
Cadmium	Dissolved	µg/L	0.08	0.02	<0.01	0.01
Chromium	Dissolved	µg/L	0.4	<0.4	0.4	0.4
Cobalt	Dissolved	µg/L	4.85	1.03	0.84	0.02
Copper	Dissolved	µg/L	4	<1	3	1
Iron	Dissolved	ug/L	<5	<5	1500	10
Lead	Dissolved	µg/L	<0.1	<0.1	<0.1	0.1
Lithium	Dissolved	µg/L	10	10	23	1
Manganese	Dissolved	ug/L	491	158	58	5
Mercury	Total Dissolved	ug/L	<0.01	<0.01	<0.01	0.01
Molybdenum	Dissolved	µg/L	9.7	9.7	1.8	0.1
Nickel	Dissolved	µg/L	21	3	5	1
Selenium	Dissolved	µg/L	<0.6	<0.6	<0.6	0.6
Silver	Dissolved	µg/L	<0.01	<0.01	<0.01	0.01
Strontium	Dissolved	µg/L	3032	1434	4745	1.0
Tellurium	Dissolved	µg/L	<0.1	<0.1	<0.1	0.1
Thallium	Dissolved	µg/L	0.04	<0.01	<0.01	0.01
Thorium	Dissolved	µg/L	<0.4	<0.4	<0.4	0.4
Tin	Dissolved	µg/L	<0.1	<0.1	<0.1	0.1
Titanium	Dissolved	µg/L	0.9	0.7	0.9	0.4
Uranium	Dissolved	µg/L	76.4	2.1	4.9	0.4
Vanadium	Dissolved	µg/L	1.0	0.3	0.2	0.1
Zinc	Dissolved	µg/L	10	3	5	1
Zirconium	Dissolved	µg/L	0.7	0.1	0.3	0.1

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Analytical Report

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Reference Number	774941-5
Sample Date	Nov 15, 2010
Sample Time	NA
Sample Location	
Sample Description	Deep Creek / DC-QC02
Matrix	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Inorganic Nonmetallic Parameters						
Ammonia - N		mg/L	0.04			
Nitrate - N		mg/L	<0.01			0.01
Metals Dissolved						
Sulfur	Dissolved	mg/L	572			0.2
Routine Water						
pH	@ 25 °C		7.40			
Calcium	Dissolved	mg/L	207			0.1
Magnesium	Dissolved	mg/L	459			0.1
Phosphorus	Dissolved	mg/L	<0.01			0.01
Potassium	Dissolved	mg/L	3.5			0.1
Silicon	Dissolved	mg/L	6.75			0.05
Sodium	Dissolved	mg/L	56.8			0.1
Hardness	as CaCO3	mg/L	2410			5
Salinity	Dissolved	g/L	0.143			0.0001
Volatile Petroleum Hydrocarbons - Water						
VHw6-10		ug/L	<50			50
VPHw (VHw6-10 minus BTEX)		ug/L	<50			50
Trace Metals Dissolved						
Aluminum	Dissolved	µg/L	<5			5
Antimony	Dissolved	µg/L	<0.2			0.2
Arsenic	Dissolved	µg/L	8.2			0.2
Barium	Dissolved	µg/L	12			1
Beryllium	Dissolved	µg/L	<0.04			0.04
Bismuth	Dissolved	µg/L	<1			1
Boron	Dissolved	µg/L	13			4
Cadmium	Dissolved	µg/L	<0.01			0.01
Chromium	Dissolved	µg/L	0.4			0.4
Cobalt	Dissolved	µg/L	0.99			0.02
Copper	Dissolved	µg/L	2			1
Iron	Dissolved	ug/L	1040			10
Lead	Dissolved	µg/L	<0.1			0.1
Lithium	Dissolved	µg/L	24			1
Manganese	Dissolved	ug/L	69			5
Mercury	Total Dissolved	ug/L	<0.01			0.01
Molybdenum	Dissolved	µg/L	2.5			0.1

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Analytical Report

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Reference Number	774941-5
Sample Date	Nov 15, 2010
Sample Time	NA
Sample Location	
Sample Description	Deep Creek / DC-QC02
Matrix	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Trace Metals Dissolved - Continued						
Nickel	Dissolved	µg/L	5			1
Selenium	Dissolved	µg/L	<0.6			0.6
Silver	Dissolved	µg/L	<0.01			0.01
Strontium	Dissolved	µg/L	5011			1.0
Tellurium	Dissolved	µg/L	<0.1			0.1
Thallium	Dissolved	µg/L	<0.01			0.01
Thorium	Dissolved	µg/L	<0.4			0.4
Tin	Dissolved	µg/L	<0.1			0.1
Titanium	Dissolved	µg/L	1.1			0.4
Uranium	Dissolved	µg/L	5.9			0.4
Vanadium	Dissolved	µg/L	0.2			0.1
Zinc	Dissolved	µg/L	6			1
Zirconium	Dissolved	µg/L	0.3			0.1

Approved by: Marie England

Marie England
Consulting Scientist

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Aggregate Organic Constituents

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Chemical Oxygen Demand	mg/L	1.618	-7	8	yes
Date Acquired: November 22, 2010					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Chemical Oxygen Demand	mg O2/L	48	49	10	2	yes
Date Acquired: November 22, 2010						

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Chemical Oxygen Demand	mg O2/L	310	286	322	yes
Date Acquired: November 22, 2010					
Chemical Oxygen Demand	mg O2/L	71	68	86	yes
Date Acquired: November 22, 2010					
Chemical Oxygen Demand	mg O2/L	20	16	24	yes
Date Acquired: November 22, 2010					

Inorganic Nonmetallic Parameters

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Ammonium - N	ug/L	8.29	-110.00	10.00	yes
Date Acquired: November 19, 2010					
Ammonium - N	mg/L	0	-0.05	0.05	yes
Nitrogen	mg/L	0.03	-0.06	0.06	yes
Phosphorus	mg/L	-0.004	-0.05	0.05	yes
Orthophosphate-P	mg/L	0.006	-0.05	0.05	yes
Organic Carbon	mg/L	0.325	-0.5	0.5	yes
Date Acquired: November 22, 2010					

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Ammonium - N	ug/L	101.12	85	115	yes
Date Acquired: November 19, 2010					
Ammonium - N	ug/L	110.36	70	130	yes
Date Acquired: November 19, 2010					
Nitrite - N	mg/L	107.33	90	110	yes
Nitrate and Nitrite - N	mg/L	95.00	90	110	yes
Date Acquired: November 18, 2010					

Certified Reference Material	Units	Measured	Target	Lower Limit	Upper Limit	Passed QC
Ammonia - N	mg/L	0.59		0.00	0.00	yes
Ammonium - N	mg/L	0.59	0.62	0.52	0.72	yes
Nitrate - N	mg/L	0.67	0.65	0.55	0.75	yes
Nitrate and Nitrite - N	mg/L	0.67	0.65	0.55	0.75	yes
Date Acquired: November 18, 2010						

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Inorganic Nonmetallic Parameters - Continued

Certified Reference Material	Units	Measured	Target	Lower Limit	Upper Limit	Passed QC
Nitrate - N	mg/L	<0.01	0.00	-0.15	0.15	yes
Nitrite - N	mg/L	1.26	1.192	1.040	1.340	yes
Nitrate and Nitrite - N	mg/L	1.21	1.19	0.89	1.49	yes
Date Acquired:	November 18, 2010					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Ammonium - N	mg/L	0.43	0.44	10	0.10	yes
Nitrogen	mg/L	59.8	58.8	10	0.06	yes
Phosphorus	mg/L	9.31	9.12	10	0.20	yes
Orthophosphate-P	mg/L	0.09	0.09	10	0.05	yes
Organic Carbon	mg/L	14.2	14.1	10	1.0	yes
Date Acquired:	November 22, 2010					
Ammonia - N	mg/L	0.02	0.02	20	0.50	yes
Nitrate - N	mg/L	<0.01	<0.01	15	0.05	yes
Nitrite - N	mg/L	<0.005	0.016	10	0.030	yes
Nitrate and Nitrite - N	mg/L	<0.01	<0.01	10	0.05	yes
Date Acquired:	November 18, 2010					

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Nitrate - N	mg/L	<0.01	-0.01	0.02	yes
Nitrite - N	mg/L	<0.005	-0.004	0.006	yes
Nitrate and Nitrite - N	mg/L	<0.01	0.00	0.01	yes
Date Acquired:	November 18, 2010				
Ammonium - N	mg/L	2.96	2.77	3.19	yes
Nitrogen	mg/L	121	103.98	137.82	yes
Phosphorus	mg/L	7.97	7.64	8.36	yes
Organic Carbon	mg/L	117	102.8	128.8	yes
Date Acquired:	November 22, 2010				
Ammonium - N	mg/L	0.81	0.73	0.85	yes
Nitrogen	mg/L	15.0	12.99	16.41	yes
Phosphorus	mg/L	2.05	1.92	2.16	yes
Orthophosphate-P	mg/L	0.40	0.37	0.42	yes
Organic Carbon	mg/L	14.9	13.3	16.7	yes
Date Acquired:	November 22, 2010				
Nitrogen	mg/L	1.08	0.81	1.23	yes
Orthophosphate-P	mg/L	0.07	0.07	0.09	yes
Organic Carbon	mg/L	2.9	2.5	3.8	yes
Date Acquired:	November 22, 2010				

Metals Dissolved

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Metals Dissolved

Certified Reference Material	Units	Measured	Target	Lower Limit	Upper Limit	Passed QC
Aluminum	mg/L	0.053	0.060	0.052	0.068	yes
Antimony	mg/L	0.0152	0.0150	0.0110	0.0190	yes
Arsenic	mg/L	0.0100	0.0109	0.0089	0.0131	yes
Barium	mg/L	0.068	0.070	0.063	0.077	yes
Beryllium	mg/L	0.0113	0.01200	0.01029	0.01371	yes
Boron	mg/L	0.068	0.075	0.050	0.110	yes
Cadmium	mg/L	0.01650	0.01790	0.01533	0.02067	yes
Chromium	mg/L	0.0656	0.0677	0.0563	0.0797	yes
Cobalt	mg/L	0.0780	0.07980	0.07010	0.08990	yes
Copper	mg/L	0.063	0.065	0.060	0.070	yes
Lead	mg/L	0.0513	0.0531	0.0451	0.0610	yes
Molybdenum	mg/L	0.0724	0.07390	0.06161	0.08639	yes
Nickel	mg/L	0.062	0.063	0.057	0.069	yes
Selenium	mg/L	0.0186	0.0190	0.0147	0.0234	yes
Silver	mg/L	0.01140	0.01250	0.01041	0.01359	yes
Strontium	mg/L	0.042	0.043	0.037	0.049	yes
Thallium	mg/L	0.00959	0.00996	-0.01370	0.03370	yes
Vanadium	mg/L	0.0532	0.05390	0.04740	0.06060	yes
Zinc	mg/L	0.064	0.067	0.059	0.075	yes
Date Acquired:	November 18, 2010					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Sulfur	mg/L	660	665	30	3.0	yes
Date Acquired:	November 18, 2010					

Physical and Aggregate Properties

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Solids	mg/L	4060	4080	30	25	yes
Date Acquired:	November 22, 2010					

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Solids	mg/L	582	471	619	yes
Date Acquired:	December 06, 2010				
Solids	mg/L	28	19	34	yes
Date Acquired:	November 22, 2010				
Solids	mg/L	<5	-5	5	yes
Date Acquired:	December 06, 2010				

Routine Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Calcium	mg/L	-0.0177	-0.05	0.05	yes

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Quality Control

Bill To:	EBA Engineering Consultants	Project:		Lot ID:	**774941**
Report To:	EBA Engineering Consultants	ID:	W23101317	Control Number:	A157946
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program	Date Received:	Nov 17, 2010
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill	Date Reported:	Dec 9, 2010
	Y1A 2V3	LSD:	Deep Creek	Report Number:	1394856
Attn:	Adam Seeley	P.O.:			
Sampled By:	Eliane Roy	Acct code:			
Company:	EBA				

Routine Water - Continued

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Iron	mg/L	-0.0003	-0.031	0.029	yes
Magnesium	mg/L	-0.0014	-0.05	0.07	yes
Manganese	mg/L	0.0001	-0.008	-0.000	yes
Phosphorus	mg/L	0.0085	-0.04	0.04	yes
Potassium	mg/L	-0.0064	-0.4	0.4	yes
Silicon	mg/L	-0.0575	-0.20	0.25	yes
Sodium	mg/L	-0.0095	-0.2	0.2	yes
Date Acquired:	November 18, 2010				
Calcium	mg/L	-0.0152	-0.13	0.16	yes
Iron	mg/L	-0.0031	-0.024	0.025	yes
Magnesium	mg/L	0.005	-0.07	0.08	yes
Manganese	mg/L	0.0008	-0.009	0.002	yes
Phosphorus	mg/L	0.007	-0.14	0.16	yes
Potassium	mg/L	-0.0032	-0.8	0.8	yes
Silicon	mg/L	-0.0605	-1.76	2.02	yes
Sodium	mg/L	0.002	-0.3	0.4	yes
Date Acquired:	November 18, 2010				
Nitrate - N	mg/L	0.00667368	-0.01	0.01	yes
Nitrite - N	mg/L	0.00203582	-0.005	0.005	yes
Date Acquired:	November 22, 2010				
Chloride	mg/L	0	-0.20	0.20	yes
Sulfate (SO4)	mg/L	0.993502	-0.99	0.99	yes
Date Acquired:	November 17, 2010				

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
pH	pH	100.04	98	101	yes
Date Acquired:	November 18, 2010				
Calcium	mg/L	97.66	91	109	yes
Iron	mg/L	82.20	0	0	yes
Magnesium	mg/L	98.57	91	109	yes
Manganese	mg/L	95.00	90	110	yes
Phosphorus	mg/L	102.96	90	110	yes
Potassium	mg/L	94.88	85	115	yes
Silicon	mg/L	88.62	80	120	yes
Sodium	mg/L	93.73	90	110	yes
Date Acquired:	November 18, 2010				
Chloride	mg/L	114.09	85	115	yes
Sulfate (SO4)	mg/L	96.81	85	115	yes
Date Acquired:	November 17, 2010				
Chloride	mg/L	97.50	90	110	yes
Sulfate (SO4)	mg/L	98.14	90	110	yes

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Routine Water - Continued

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit		Passed QC
Date Acquired:	November 17, 2010					

Certified Reference Material	Units	Measured	Target	Lower Limit	Upper Limit	Passed QC
T-Alkalinity	mg/L	10	10	8	11	yes
Date Acquired:	November 18, 2010					
Calcium	mg/L	15.4	14.85	11.55	18.25	yes
Magnesium	mg/L	9.2	9.07	6.88	11.26	yes
Manganese	mg/L	0.074	0.078	0.072	0.084	yes
Potassium	mg/L	8.1	8.6	6.4	10.8	yes
Sodium	mg/L	13.9	14.2	11.7	16.7	yes
Date Acquired:	November 18, 2010					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Nitrate - N	mg/L	143	142	10	0.01	yes
Nitrite - N	mg/L	0.14	0.14	10	0.010	yes
Date Acquired:	November 22, 2010					
Calcium	mg/L	142	139	30	1.00	yes
Iron	mg/L	<0.005	<0.005	30	0.060	yes
Magnesium	mg/L	560	557	30	1.00	yes
Manganese	mg/L	0.491	0.491	30	0.015	yes
Phosphorus	mg/L	0.02	0.02	30	0.10	yes
Potassium	mg/L	4.8	4.8	30	1.0	yes
Silicon	mg/L	5.63	5.65	30	0.15	yes
Sodium	mg/L	98.3	98.3	30	1.0	yes
Date Acquired:	November 18, 2010					
pH		9.25	9.26	2		yes
Electrical Conductivity	dS/m at 25 C	0.180	0.179	10	0.005	yes
Bicarbonate	mg/L	100	100	10	10	yes
Carbonate	mg/L	<6	<6	10	10	yes
Hydroxide	mg/L	<5	<5	10	10	yes
P-Alkalinity	mg/L	<5	<5	10	5	yes
T-Alkalinity	mg/L	92	90	10	5	yes
Chloride	mg/L	2.61	2.60	15	0.25	yes
Sulfate (SO4)	mg/L	7.18	7.05	15	0.50	yes
Date Acquired:	November 17, 2010					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Chloride	mg/L	0.81	0.80	6	0.01	yes
Sulfate (SO4)	mg/L	4.26	4.44	6	0.01	yes
Date Acquired:	November 17, 2010					

Control Sample	Units	Measured	Lower Limit	Upper Limit		Passed QC

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Routine Water - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
pH		10.3	9.08	10.92	yes
Electrical Conductivity	µS/cm at 25 C	220	165	243	yes
P-Alkalinity	mg/L	41	9	53	yes
T-Alkalinity	mg/L	95	90	101	yes
Date Acquired:	November 18, 2010				
Electrical Conductivity	µS/cm at 25 C	1420	1330	1510	yes
Date Acquired:	November 18, 2010				
Electrical Conductivity	µS/cm at 25 C	<1	-2	2	yes
Date Acquired:	November 18, 2010				
Nitrate - N	mg/L	10.1	9.51	10.49	yes
Nitrite - N	mg/L	10.1	9.510	10.530	yes
Nitrate and Nitrite - N	mg/L	20.2	18.09	22.11	yes
Date Acquired:	November 22, 2010				
Nitrate - N	mg/L	0.51	0.45	0.55	yes
Nitrite - N	mg/L	0.511	0.452	0.548	yes
Nitrate and Nitrite - N	mg/L	1.02	0.79	1.19	yes
Date Acquired:	November 22, 2010				

Extractable Petroleum Hydrocarbons - Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
EPHw10-19	ug/mL	60.04	-100	100	yes
EPHw19-32	ug/mL	51.52	-100	100	yes
Date Acquired:	November 20, 2010				

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
EPHw10-19	ug/mL	104.40	85	115	yes
EPHw19-32	ug/mL	104.40	85	115	yes
Date Acquired:	November 20, 2010				

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
EPHw10-19	ug/L	400	400	60	500	yes
EPHw19-32	ug/L	400	400	60	500	yes
Date Acquired:	November 20, 2010					

Matrix Spike	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
EPHw10-19	ug/L	95	79	128	yes
EPHw19-32	ug/L	95	81	136	yes
Date Acquired:	November 20, 2010				

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Polycyclic Aromatic Hydrocarbons - Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Acenaphthene	ng/mL	0	-0.1	0.1	yes
Acenaphthylene	ng/mL	0	-0.1	0.1	yes
Acridine	ng/mL	0	-0.05	0.05	yes
Anthracene	ng/mL	0	-0.1	0.1	yes
Benzo(a)anthracene	ng/mL	0.00023	-0.01	0.01	yes
Benzo(a)pyrene	ng/mL	0	-0.01	0.01	yes
Benzo(b)fluoranthene	ng/mL	0	-0.01	0.01	yes
Benzo(g,h,i)perylene	ng/mL	0	-0.1	0.1	yes
Benzo(k)fluoranthene	ng/mL	0	-0.01	0.01	yes
Chrysene	ng/mL	0.00045	-0.1	0.1	yes
Dibenzo(a,h)anthracene	ng/mL	0	-0.01	0.01	yes
Fluoranthene	ng/mL	0	-0.1	0.1	yes
Fluorene	ng/mL	0	-0.1	0.1	yes
Indeno(1,2,3-c,d)pyrene	ng/mL	0	-0.1	0.1	yes
Naphthalene	ng/mL	0	-0.1	0.1	yes
Phenanthrene	ng/mL	0	-0.1	0.1	yes
Pyrene	ng/mL	0	-0.02	0.02	yes
Quinoline	ng/mL	0	-3.4	3.4	yes

Date Acquired: November 20, 2010

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Acenaphthene	ng/mL	98.61	80	120	yes
Acenaphthylene	ng/mL	97.73	80	120	yes
Acridine	ng/mL	97.74	80	120	yes
Anthracene	ng/mL	99.95	80	120	yes
Benzo(a)anthracene	ng/mL	97.90	80	120	yes
Benzo(a)pyrene	ng/mL	98.14	80	120	yes
Benzo(b)fluoranthene	ng/mL	95.85	80	120	yes
Benzo(g,h,i)perylene	ng/mL	97.84	80	120	yes
Benzo(k)fluoranthene	ng/mL	100.22	80	120	yes
Chrysene	ng/mL	99.88	80	120	yes
Dibenzo(a,h)anthracene	ng/mL	96.69	80	120	yes
Fluoranthene	ng/mL	98.56	80	120	yes
Fluorene	ng/mL	97.78	80	120	yes
Indeno(1,2,3-c,d)pyrene	ng/mL	97.22	80	120	yes
Naphthalene	ng/mL	99.17	80	120	yes
Phenanthrene	ng/mL	97.69	80	120	yes
Pyrene	ng/mL	98.50	80	120	yes
Quinoline	ng/mL	97.68	80	120	yes

Date Acquired: November 20, 2010

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Polycyclic Aromatic Hydrocarbons - Water - Continued

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Acenaphthene	ug/L	94.8	97.5	60	0.5	yes
Acenaphthylene	ug/L	87.2	89.7	60	0.5	yes
Acridine	ug/L	85.0	87.0	60	0.25	yes
Anthracene	ug/L	93.8	95.8	60	0.5	yes
Benzo(a)anthracene	ug/L	87.1	89.9	60	0.05	yes
Benzo(a)pyrene	ug/L	91.2	93.4	60	0.05	yes
Benzo(b)fluoranthene	ug/L	81.6	85.5	60	0.05	yes
Benzo(g,h,i)perylene	ug/L	84.9	88.1	60	0.5	yes
Benzo(k)fluoranthene	ug/L	91.7	95.2	60	0.05	yes
Chrysene	ug/L	96.8	99.7	60	0.5	yes
Dibenzo(a,h)anthracene	ug/L	70.0	71.5	60	0.05	yes
Fluoranthene	ug/L	90.0	91.8	60	0.5	yes
Fluorene	ug/L	90.8	93.2	60	0.5	yes
Indeno(1,2,3-c,d)pyrene	ug/L	76.7	78.1	60	0.5	yes
Naphthalene	ug/L	101	103	60	0.5	yes
Phenanthrene	ug/L	83.6	86.1	60	0.5	yes
Pyrene	ug/L	100	102	60	0.10	yes
Quinoline	ug/L	89.5	92.3	60	17.0	yes

Date Acquired: November 20, 2010

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Acenaphthene	ug/L	94.8	50.0	130.0	yes
Acenaphthylene	ug/L	87.2	50.0	130.0	yes
Acridine	ug/L	85.0	50.01	129.99	yes
Anthracene	ug/L	93.8	50.0	130.0	yes
Benzo(a)anthracene	ug/L	87.1	50.01	129.99	yes
Benzo(a)pyrene	ug/L	91.2	50.01	129.99	yes
Benzo(b)fluoranthene	ug/L	81.6	50.01	129.99	yes
Benzo(g,h,i)perylene	ug/L	84.9	50.0	130.0	yes
Benzo(k)fluoranthene	ug/L	91.7	50.01	129.99	yes
Chrysene	ug/L	96.8	50.0	130.0	yes
Dibenzo(a,h)anthracene	ug/L	70.0	50.01	129.99	yes
Fluoranthene	ug/L	90.0	50.0	130.0	yes
Fluorene	ug/L	90.8	50.0	130.0	yes
Indeno(1,2,3-c,d)pyrene	ug/L	76.7	50.0	130.0	yes
Naphthalene	ug/L	101	50.0	130.0	yes
Phenanthrene	ug/L	83.6	50.0	130.0	yes
Pyrene	ug/L	100	50.01	129.99	yes
Quinoline	ug/L	89.5	50.0	130.0	yes

Date Acquired: November 20, 2010

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

PAH - Water - Surrogate Recovery

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
2-Fluorobiphenyl	%	98.27	80	120	yes
Nitrobenzene-d5	%	97.74	80	120	yes
p-Terphenyl-d14	%	99.08	80	120	yes
Date Acquired:	November 20, 2010				

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
2-Fluorobiphenyl	%	89	95	60	0	yes
Nitrobenzene-d5	%	84	91	60	0	yes
p-Terphenyl-d14	%	89	90	60	0	yes
Date Acquired:	November 20, 2010					

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
2-Fluorobiphenyl	%	89	40	130	yes
Nitrobenzene-d5	%	84	40	130	yes
p-Terphenyl-d14	%	89	40	130	yes
Date Acquired:	November 20, 2010				

VOC Screen - Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Benzene	ng	0	-2	2	yes
Bromodichloromethane	ng	0	-2	2	yes
Bromoform	ng	0	-2	2	yes
Bromomethane	ng	0	-15	15	yes
Carbon Tetrachloride	ng	0	-2	2	yes
Chlorobenzene	ng	0	-2	2	yes
Chloroethane	ng	0	-15	15	yes
2-Chloroethyl Vinyl Ether	ng	0	-2	2	yes
Chloroform	ng	0	-2	2	yes
Chloromethane	ng	0	-15	15	yes
Dibromochloromethane	ng	0	-2	2	yes
1,2-Dichlorobenzene	ng	0	-2	2	yes
1,3-Dichlorobenzene	ng	0	-2	2	yes
1,4-Dichlorobenzene	ng	0	-2	2	yes
1,1-Dichloroethane	ng	0	-2	2	yes
1,2-Dichloroethane	ng	0	-2	2	yes
1,1-Dichloroethene	ng	0	-2	2	yes
1,2-Dichloroethene(cis)	ng	0	-2	2	yes
1,2-Dichloroethene(trans)	ng	0	-2	2	yes
1,2-Dichloropropane	ng	0	-2	2	yes
1,3-Dichloropropene(cis)	ng	0	-2	2	yes
1,3-Dichloropropene(trans)	ng	0	-2	2	yes
Ethylbenzene	ng	0	-2	2	yes

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

VOC Screen - Water - Continued

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Methylene Chloride	ng	0	-15	15	yes
Styrene	ng	0	-2	2	yes
1,1,2,2-Tetrachloroethane	ng	0	-2	2	yes
Tetrachloroethene	ng	0	-2	2	yes
Toluene	ng	0	-2	2	yes
1,1,1-Trichloroethane	ng	0	-2	2	yes
1,1,2-Trichloroethane	ng	0	-2	2	yes
Trichloroethene	ng	0	-2	2	yes
Trichlorofluoromethane	ng	0	-2	2	yes
Vinyl Chloride	ng	0	-15	15	yes
Xylene-m&p	ng	0	0	0	yes
Xylene-o	ng	0	0	0	yes
Total Xylenes (m,p,o)	ng	0	-2	2	yes

Date Acquired: November 19, 2010

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Benzene	ng	99.88	78	122	yes
Bromodichloromethane	ng	109.26	78	122	yes
Bromoform	ng	100.80	78	122	yes
Bromomethane	ng		78	122	yes
Carbon Tetrachloride	ng		78	122	yes
Chlorobenzene	ng	106.04	78	122	yes
Chloroethane	ng		78	122	yes
2-Chloroethyl Vinyl Ether	ng		78	122	yes
Chloroform	ng	97.58	78	122	yes
Chloromethane	ng		78	122	yes
Dibromochloromethane	ng	109.96	78	122	yes
1,2-Dichlorobenzene	ng	104.78	78	122	yes
1,3-Dichlorobenzene	ng	108.46	78	122	yes
1,4-Dichlorobenzene	ng	107.54	78	122	yes
1,1-Dichloroethane	ng	110.94	78	122	yes
1,2-Dichloroethane	ng		78	122	yes
1,1-Dichloroethene	ng	99.50	78	122	yes
1,2-Dichloroethene(cis)	ng	94.42	78	122	yes
1,2-Dichloroethene(trans)	ng	93.22	78	122	yes
1,2-Dichloropropane	ng	103.68	78	122	yes
1,3-Dichloropropene(cis)	ng	109.74	78	122	yes
1,3-Dichloropropene(trans)	ng		78	122	yes
Ethylbenzene	ng	111.50	78	122	yes
Methylene Chloride	ng		78	122	yes
Styrene	ng	108.24	78	122	yes
1,1,2,2-Tetrachloroethane	ng	91.56	78	122	yes
Tetrachloroethene	ng	108.94	78	122	yes

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

VOC Screen - Water - Continued

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Toluene	ng	105.14	78	122	yes
1,1,1-Trichloroethane	ng	108.54	78	122	yes
1,1,2-Trichloroethane	ng	103.94	78	122	yes
Trichloroethene	ng	107.24	78	122	yes
Trichlorofluoromethane	ng	109.26	78	122	yes
Vinyl Chloride	ng	109.86	78	122	yes
Xylene-m&p	ng	108.75	78	122	yes
Xylene-o	ng	109.30	78	122	yes
Total Xylenes (m,p,o)	ng	108.93	78	122	yes

Date Acquired: November 19, 2010

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Benzene	ug/L	5	5	15	2	yes
Bromodichloromethane	ug/L	5	5	15	2	yes
Bromoform	ug/L	6	6	15	2	yes
Bromomethane	ug/L	<10	<10	15	20	yes
Carbon Tetrachloride	ug/L	5	5	15	2	yes
Chlorobenzene	ug/L	5	5	15	2	yes
Chloroethane	ug/L	<10	<10	15	20	yes
Chloroform	ug/L	5	6	15	2	yes
Chloromethane	ug/L	<10	<10	15	20	yes
Dibromochloromethane	ug/L	5	5	15	2	yes
1,2-Dichlorobenzene	ug/L	5	5	15	2	yes
1,3-Dichlorobenzene	ug/L	5	6	15	2	yes
1,4-Dichlorobenzene	ug/L	5	6	15	2	yes
1,1-Dichloroethane	ug/L	5	5	15	2	yes
1,2-Dichloroethane	ug/L	10	10	15	2	yes
1,1-Dichloroethene	ug/L	5	4	15	2	yes
1,2-Dichloroethene(cis)	ug/L	5	4	15	2	yes
1,2-Dichloroethene(trans)	ug/L	4	4	15	2	yes
1,2-Dichloropropane	ug/L	4	4	15	2	yes
1,3-Dichloropropene(cis)	ug/L	11	11	15	2	yes
1,3-Dichloropropene(trans)	ug/L	11	11	15	2	yes
Ethylbenzene	ug/L	5	5	15	2	yes
Methylene Chloride	ug/L	<5	<5	30	20	yes
Styrene	ug/L	21	21	15	2	yes
1,1,2,2-Tetrachloroethane	ug/L	5	5	15	2	yes
Tetrachloroethene	ug/L	6	5	15	2	yes
Toluene	ug/L	5	5	15	2	yes
1,1,1-Trichloroethane	ug/L	5	5	15	2	yes
1,1,2-Trichloroethane	ug/L	5	5	15	2	yes
Trichloroethene	ug/L	5	6	15	2	yes
Trichlorofluoromethane	ug/L	5	5	15	2	yes

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

VOC Screen - Water - Continued

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Vinyl Chloride	ug/L	5	5	15	20	yes
Xylene-m&p	ug/L	11	11	15	2	yes
Xylene-o	ug/L	5	5	15	2	yes
Total Xylenes (m,p,o)	ug/L	16	16	15	2	yes

Date Acquired: November 19, 2010

VOC - Water - Surrogate Recovery

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Dibromofluoromethane	%	107.63	85	115	yes
Toluene-d8	%	97.17	85	115	yes
Bromofluorobenzene	%	108.98	85	115	yes

Date Acquired: November 19, 2010

Trace Metals Dissolved

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Aluminum	µg/L	-5.425	-10	10	yes
Antimony	µg/L	-0.044	-0.4	0.2	yes
Arsenic	µg/L	-0.04	-0.5	0.5	yes
Barium	µg/L	-0.02	-0	0	yes
Beryllium	µg/L	-0.002	-0.10	0.10	yes
Bismuth	µg/L	-0.033	-1.0	1.0	yes
Boron	µg/L	-1.401	-6	5	yes
Cadmium	µg/L	-0.01	-0.03	0.03	yes
Chromium	µg/L	-0.013	-0.1	0.2	yes
Cobalt	µg/L	-0.009	-0.07	0.07	yes
Copper	µg/L	-0.088	-1	1	yes
Lead	µg/L	0.027	-0.1	0.1	yes
Lithium	µg/L	-0.001	-1	1	yes
Molybdenum	µg/L	-0.149	-0.31	0.29	yes
Nickel	µg/L	-0.003	-1	1	yes
Selenium	µg/L	-0.04	-1.7	1.3	yes
Silver	µg/L	-0.006	-0.05	0.05	yes
Strontium	µg/L	0.01	-0	0	yes
Tellurium	µg/L	-0.135	-0.7	0.7	yes
Thallium	µg/L	-0.006	-0.03	0.03	yes
Thorium	µg/L	-0.013	-1.5	1.5	yes
Tin	µg/L	0.005	-3.0	3.0	yes
Titanium	µg/L	-0.156	-0.2	0.2	yes
Uranium	µg/L	-0.008	-0.03	0.03	yes
Vanadium	µg/L	-0.007	-0.35	0.35	yes
Zinc	µg/L	0.039	-2	4	yes

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Trace Metals Dissolved - Continued

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Zirconium	µg/L	0.04	-0.0	0.0	yes
Date Acquired:	November 18, 2010				
Aluminum	µg/L	-5.49	-6	6	yes
Antimony	µg/L	-0.027	-0.4	0.3	yes
Arsenic	µg/L	-0.006	-0.4	0.3	yes
Barium	µg/L	0.009	-0	1	yes
Beryllium	µg/L	-0.003	-0.10	0.10	yes
Bismuth	µg/L	-0.086	0.0	0.0	yes
Boron	µg/L	-2.687	-18	19	yes
Cadmium	µg/L	-0.012	-0.03	0.03	yes
Chromium	µg/L	0.014	-0.1	0.2	yes
Cobalt	µg/L	-0.011	-0.30	0.30	yes
Copper	µg/L	-0.145	-1	1	yes
Lead	µg/L	-0.024	-0.3	0.4	yes
Lithium	µg/L	-0.002	-0	0	yes
Molybdenum	µg/L	-0.177	-0.95	0.85	yes
Nickel	µg/L	0.01	-1	1	yes
Selenium	µg/L	-0.011	-1.7	1.7	yes
Silver	µg/L	-0.013	-0.67	0.47	yes
Strontium	µg/L	-0.001	-2	4	yes
Tellurium	µg/L	-0.254	-0.7	0.7	yes
Thallium	µg/L	-0.005	-0.06	0.06	yes
Thorium	µg/L	-0.103	-0.7	0.5	yes
Tin	µg/L	-0.082	-3.8	4.0	yes
Titanium	µg/L	-0.142	-0.3	0.2	yes
Uranium	µg/L	-0.003	-0.04	0.02	yes
Vanadium	µg/L	-0.012	-0.30	0.30	yes
Zinc	µg/L	0.159	-11	19	yes
Zirconium	µg/L	-0.017	-0.0	0.0	yes
Date Acquired:	November 18, 2010				
Mercury	ug/L	<0.01	-9.99	9.99	yes
Date Acquired:	November 19, 2010				

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Mercury	ng/L	99.00	85	115	yes
Date Acquired:	November 19, 2010				
Aluminum	µg/L	97.20	70	130	yes
Antimony	µg/L	89.24	85	115	yes
Arsenic	µg/L	95.56	90	110	yes
Barium	µg/L	94.66	90	110	yes
Beryllium	µg/L	99.24	90	110	yes
Bismuth	µg/L	98.60	90	110	yes

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Quality Control

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Attn: Adam Seeley
Sampled By: Eliane Roy
Company: EBA

Project:
ID: W23101317
Name: Monitoring Well Program
Location: Deep Creek Landfill
LSD: Deep Creek
P.O.:
Acct code:

Lot ID: **774941**
Control Number: A157946
Date Received: Nov 17, 2010
Date Reported: Dec 9, 2010
Report Number: 1394856

Trace Metals Dissolved - Continued

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Boron	µg/L	96.88	70	130	yes
Cadmium	µg/L	98.60	90	110	yes
Chromium	µg/L	95.48	90	110	yes
Cobalt	µg/L	96.42	90	110	yes
Copper	µg/L	94.80	90	110	yes
Lead	µg/L	99.76	90	110	yes
Lithium	µg/L	100.46	90	110	yes
Molybdenum	µg/L	94.28	90	110	yes
Nickel	µg/L	96.56	90	110	yes
Selenium	µg/L	97.48	90	110	yes
Silver	µg/L	0.11	0	0	yes
Strontium	µg/L	98.40	90	110	yes
Thallium	µg/L	99.00	90	110	yes
Tin	µg/L	98.52	90	110	yes
Titanium	µg/L	92.04	90	110	yes
Uranium	µg/L	96.58	85	115	yes
Vanadium	µg/L	94.92	90	110	yes
Zinc	µg/L	95.14	90	110	yes
Zirconium	µg/L	102.64	90	110	yes
Date Acquired:	November 18, 2010				

Certified Reference Material	Units	Measured	Target	Lower Limit	Upper Limit	Passed QC
Mercury	ug/L	0.08	0.09	0.08	0.10	yes
Date Acquired:	November 19, 2010					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Aluminum	µg/L	<5	<5	20	20	yes
Antimony	µg/L	0.6	0.8	20	1.0	yes
Arsenic	µg/L	9.1	9.2	20	1.0	yes
Barium	µg/L	23	23	20	5	yes
Beryllium	µg/L	<0.04	<0.04	20	1.00	yes
Boron	µg/L	33	36	20	5	yes
Cadmium	µg/L	0.08	0.06	20	0.50	yes
Chromium	µg/L	0.4	0.4	20	5.0	yes
Cobalt	µg/L	4.85	4.91	20	0.50	yes
Copper	µg/L	4	5	20	5	yes
Lead	µg/L	<0.1	<0.1	20	0.5	yes
Lithium	µg/L	10	10	20	5	yes
Molybdenum	µg/L	9.7	9.6	20	0.50	yes
Nickel	µg/L	21	21	20	5	yes
Selenium	µg/L	<0.6	<0.6	20	0.5	yes
Silver	µg/L	<0.01	<0.01	20	0.50	yes
Strontium	µg/L	3032	3036	20	0	yes

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Quality Control

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Trace Metals Dissolved - Continued

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Tellurium	µg/L	<0.1	<0.1	20	0.5	yes
Thallium	µg/L	0.04	0.04	20	0.10	yes
Thorium	µg/L	<0.4	<0.4	10	0.1	yes
Tin	µg/L	<0.1	0.1	20	0.5	yes
Titanium	µg/L	0.9	0.8	20	0.5	yes
Uranium	µg/L	76.4	80.5	20	0.10	yes
Vanadium	µg/L	1.0	1.0	20	0.50	yes
Zinc	µg/L	10	10	20	5	yes
Zirconium	µg/L	0.7	0.8	20	0.5	yes
Date Acquired:	November 18, 2010					
Mercury	ug/L	0.01	0.02	20	0.05	yes
Date Acquired:	November 19, 2010					

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W: www.exova.com

Methodology and Notes

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Alk, pH, EC, Turb in water	APHA	*	Alkalinity - Titration Method, 2320 B	18-Nov-10	Exova Surrey
Alk, pH, EC, Turb in water	APHA	*	pH - Electrometric Method, 4500-H+ B	18-Nov-10	Exova Surrey
Ammonia-N in Water	APHA	*	Titrametric, 4500-NH3 C	19-Nov-10	Exova Surrey
Ammonium-N in Water	APHA	*	Automated Phenate Method, 4500-NH3 G	23-Nov-10	Exova Edmonton
Anions (Routine) by Ion Chromatography	APHA	*	Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	22-Nov-10	Exova Edmonton
Anions by IEC in water (Surrey)	APHA	*	Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	17-Nov-10	Exova Surrey
BTEX-VPH - Water	BCELM	*	Volatile Hydrocarbons in Water by GC/FID, VH Water	22-Nov-10	Exova Surrey
Carbon Organic (Dissolved) in water (DOC)	APHA		High-Temperature Combustion Method, 5310 B	22-Nov-10	Exova Edmonton
Chemical Oxygen Demand in water	APHA	*	Closed Reflux, Colorimetric Method, 5220 D	22-Nov-10	Exova Edmonton
EPH - Water	BCELM	*	Extractable Petroleum Hydrocarbons (EPH) in Water by GC/FID, EPH Water	20-Nov-10	Exova Surrey
Mercury Low Level (Total) in water	EPA	*	Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	18-Nov-10	Exova Surrey
Metals SemiTrace (Dissolved) in water	US EPA	*	Metals & Trace Elements by ICP-AES, 6010C	18-Nov-10	Exova Surrey
Nitrogen - nitrite+nitrate-N	APHA	*	Automated Cadmium Reduction Method, 4500-NO3- F	18-Nov-10	Exova Surrey
Orthophosphate-P in Water	APHA	*	Automated Ascorbic Acid Reduction Method, 4500-P F	19-Nov-10	Exova Edmonton
PAH - Water (Surrey)	BCELM	*	Polycyclic Aromatic Hydrocarbons in Water by GC/MS - PBM, PAH Water	20-Nov-10	Exova Surrey
Phosphorus - Total in Water	APHA	*	Automated Ascorbic Acid Reduction Method, 4500-P F	23-Nov-10	Exova Edmonton
Solids Dissolved (Total, Fixed and Volatile)2	APHA	*	Total Dissolved Solids Dried at 180 C, 2540 C	22-Nov-10	Exova Surrey
Solids Dissolved (Total, Fixed and Volatile)2	APHA	*	Total Dissolved Solids Dried at 180 C, 2540 C	06-Dec-10	Exova Surrey
Total and Kjeldahl Nitrogen (Total) in Water	ISO	*	Water Quality - Determination of nitrogen, ISO/TR 11905-2	22-Nov-10	Exova Edmonton
VOC - Water	US EPA	*	US EPA method, 8260B/5030B	19-Nov-10	Exova Calgary

** Reference Method Modified*

References

APHA	Standard Methods for the Examination of Water and Wastewater
B.C.M.O.E	B.C. Ministry of Environment
BCELM	B.C. Environmental Laboratory Manual

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Methodology and Notes

Bill To:	EBA Engineering Consultants	Project:	
Report To:	EBA Engineering Consultants	ID:	W23101317
	Unit 6, 151 Industrial Road	Name:	Monitoring Well Program
	Whitehorse, YT, Canada	Location:	Deep Creek Landfill
	Y1A 2V3	LSD:	Deep Creek
Attn:	Adam Seeley	P.O.:	
Sampled By:	Eliane Roy	Acct code:	
Company:	EBA		

Lot ID:	**774941**
Control Number:	A157946
Date Received:	Nov 17, 2010
Date Reported:	Dec 9, 2010
Report Number:	1394856

EPA	Environmental Protection Agency Test Methods - US
ISO	International Organization for Standardization
US EPA	US Environmental Protection Agency Test Methods

Comments:

- Report was re-issued to include missing TDS analysis on sample 774941-3. Report 1393593 replaces original report 1388991.
- Report was issued to include results for nitrate and nitrite separately on samples 774941-1, 2 and 3 requested by Adam Seeley of EBA on Dec. 8/10. Report 1394856 is the 2nd addendum to report 1388991.
- pH analysis was performed past the recommended holding time of 15 minutes from sample collection.

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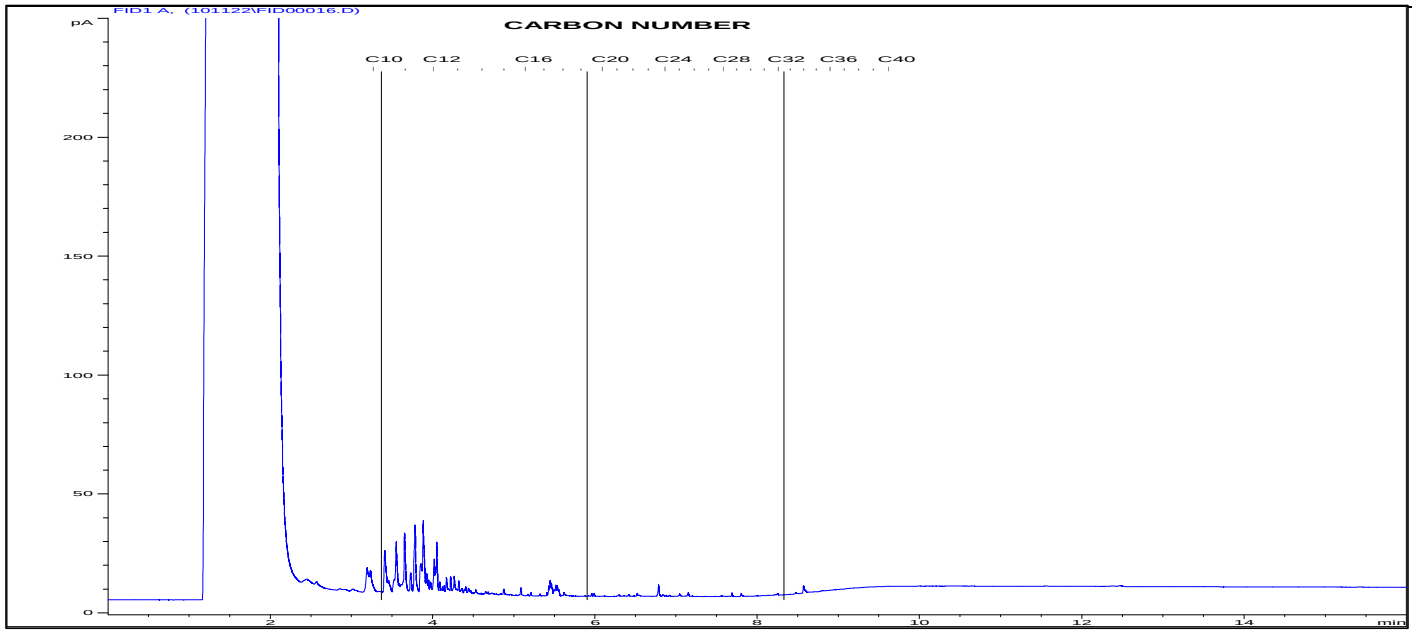
Hydrocarbon Chromatogram

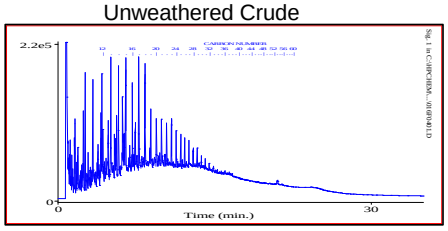
Bill To:	EBA Engineering Consultants Lt	Project ID:	W23101317	Lot ID:	**774941**
Report To:	EBA Engineering Consultants Lt	Name:	Monitoring Well Program	Control Number:	A157946
		Location:	Deep Creek Landfill	Date Received:	Nov 17, 2010
	Unit 6, 151 Industrial Road	LSD:	Deep Creek	Date Reported:	Nov 23, 2010
	Whitehorse, YT, Canada	P.O.:		Report Number:	1388991
	Y1A 2V3				
Attn:	Adam Seeley				
Sampled by:	Eliane Roy				
Company:	EBA				

Exova Number: 774941-1 Sample Description: Deep Creek DC-MW01
Sample Date: Nov 15, 2010

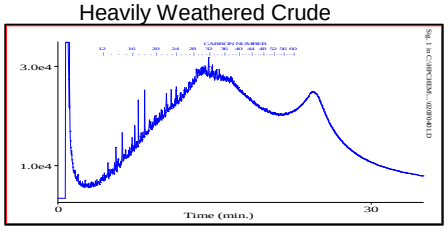


TYPICAL PRODUCT CHROMATOGRAMS

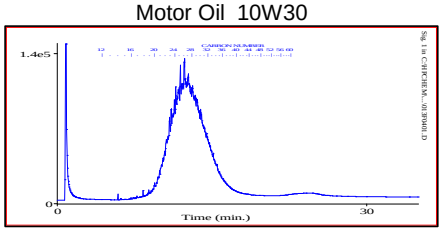
Unweathered Crude



Heavily Weathered Crude



Motor Oil 10W30



Product Carbon Number Ranges

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

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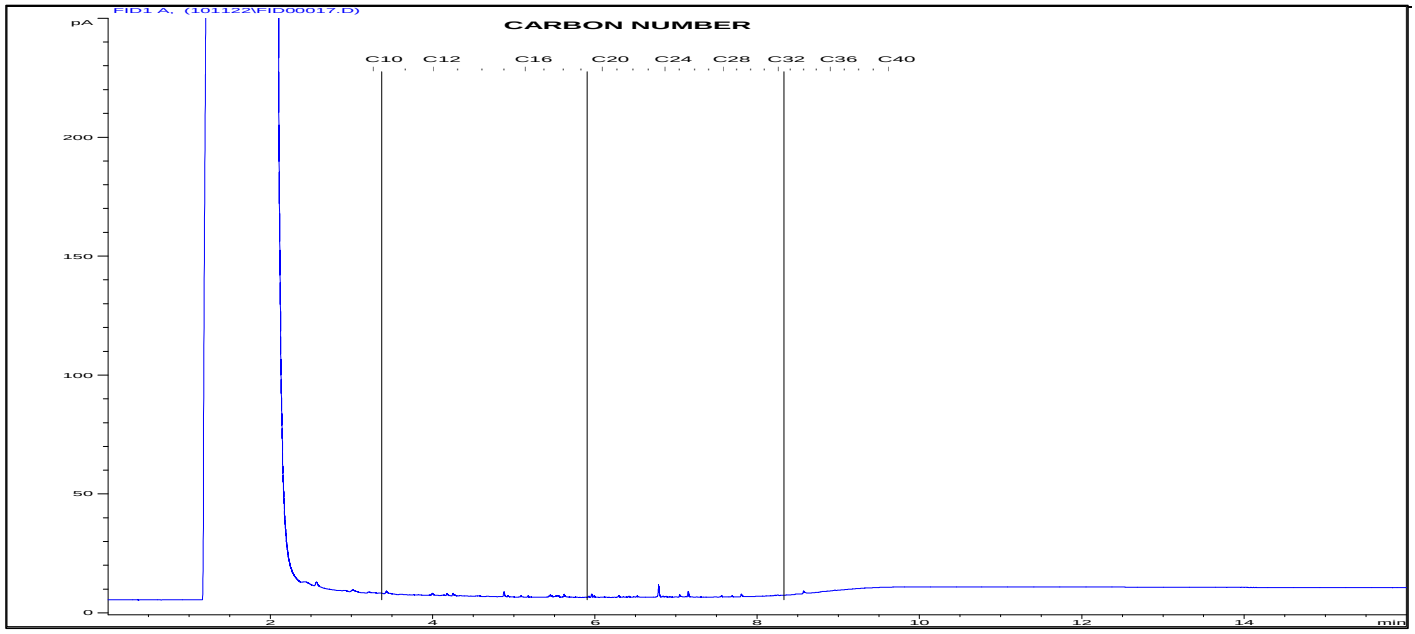
Hydrocarbon Chromatogram

Bill To:	EBA Engineering Consultants Lt	Project ID:	W23101317	Lot ID:	**774941**
Report To:	EBA Engineering Consultants Lt	Name:	Monitoring Well Program	Control Number:	A157946
		Location:	Deep Creek Landfill	Date Received:	Nov 17, 2010
	Unit 6, 151 Industrial Road	LSD:	Deep Creek	Date Reported:	Nov 23, 2010
	Whitehorse, YT, Canada	P.O.:		Report Number:	1388991
	Y1A 2V3				
Attn:	Adam Seeley				
Sampled by:	Eliane Roy				
Company:	EBA				

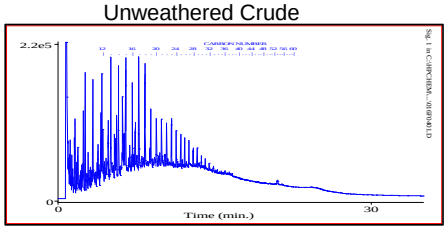
Exova Number: 774941-2
Sample Date: Nov 15, 2010

Sample Description: Deep Creek DC-MW02

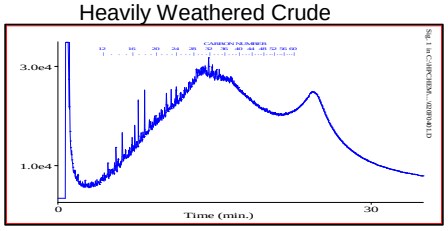


TYPICAL PRODUCT CHROMATOGRAMS

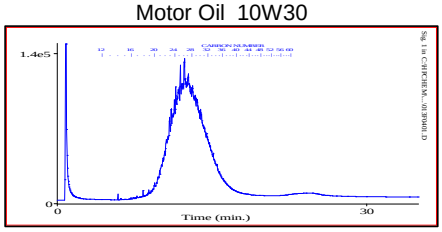
Unweathered Crude



Heavily Weathered Crude



Motor Oil 10W30



Product Carbon Number Ranges

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

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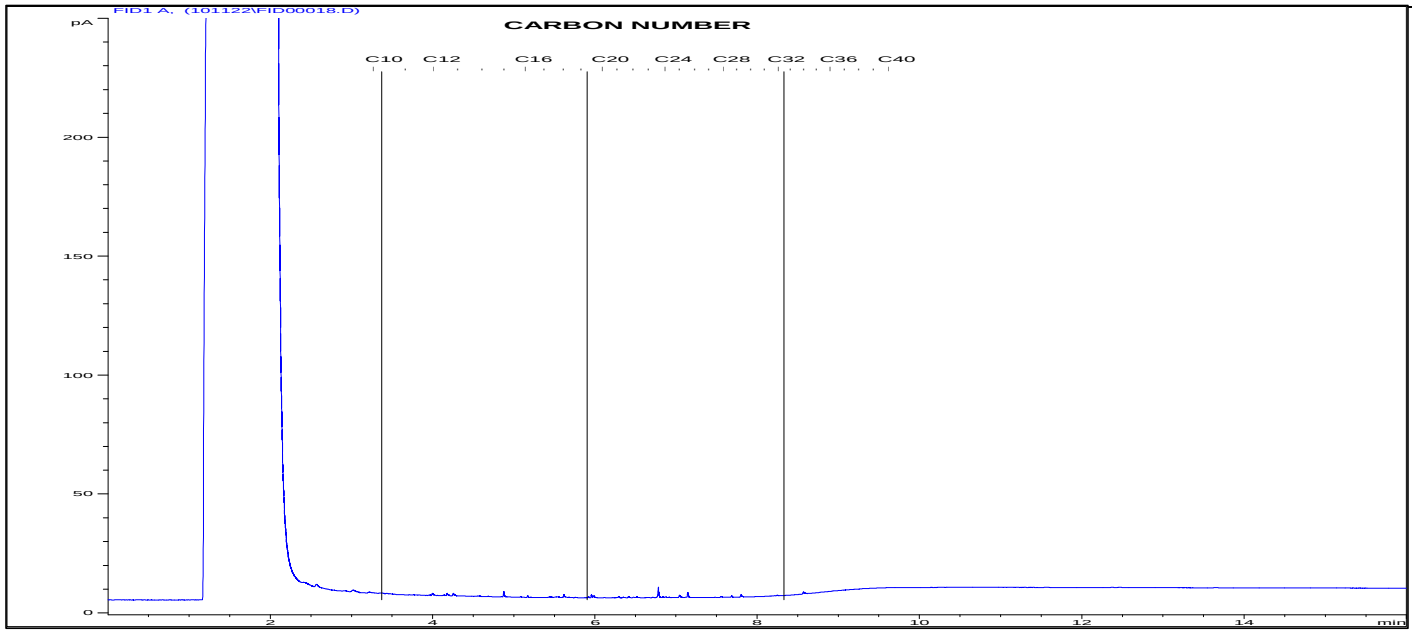
Hydrocarbon Chromatogram

Bill To:	EBA Engineering Consultants Lt	Project ID:	W23101317	Lot ID:	**774941**
Report To:	EBA Engineering Consultants Lt	Name:	Monitoring Well Program	Control Number:	A157946
		Location:	Deep Creek Landfill	Date Received:	Nov 17, 2010
	Unit 6, 151 Industrial Road	LSD:	Deep Creek	Date Reported:	Nov 23, 2010
	Whitehorse, YT, Canada	P.O.:		Report Number:	1388991
	Y1A 2V3				
Attn:	Adam Seeley				
Sampled by:	Eliane Roy				
Company:	EBA				

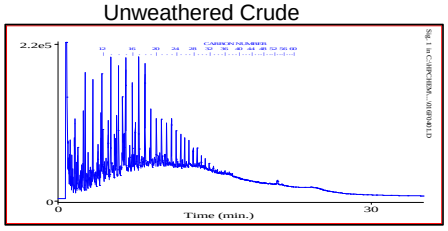
Exova Number: 774941-3
Sample Date: Nov 15, 2010

Sample Description: Deep Creek DC-MW03

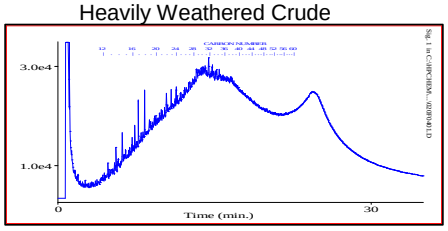


TYPICAL PRODUCT CHROMATOGRAMS

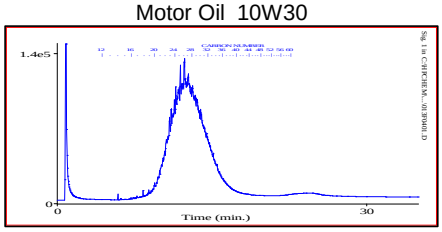
Unweathered Crude



Heavily Weathered Crude



Motor Oil 10W30



Product Carbon Number Ranges

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

Exova

Control Number A157946

www.exova.com

Environmental Sample Information Sheet

Note: Proper completion of this form is required in order to proceed with analysis

See reverse for your nearest Exova location and proper sampling protocol

Billing Address:		Copy of Report: ✓	**Copy of Report To:**		Copy of invoice:
Company:	EBA Engineering Consulting Ltd.		Company:		Send invoice to this address for approval ☐
Address:	Unit 6 151 Industrial Road Whitehorse, Yukon YT Y1A 2V3	QA/QC Report ✓	Address:	→ idem	
Attention:	Adam Seeley	Report Result:	Attention:		Report Result:
Phone:	(867) 668-2071 x 243	e-mail ✓	Phone:		e-mail ☐
Fax:	(867) 668-4349	Results Online ✓	Fax:		Results Online ☐
Cell:		Fax ☐	Cell:		Fax ☐
e-mail:	aseeley@eba.ca	Mail ☐	e-mail:		Mail ☐

Information to be included on Report and Invoice

Project ID: W2310317
Project Name: Monitoring Well Program
Project Location: Deep Creek Landfill
Legal Location: Deep Creek
PO#:
Proj. Acct. Code:
Agreement ID:

PRIORITY

Please contact laboratory prior to submitting any RUSH samples.

Upon filling out this section, client accepts that surcharges will be applied to this analysis.

If not all samples require RUSH, please indicate in special instructions.

Date Required: _____
Signature: _____

Sample Custody (Please Print)
Sampled by: ELIANE ROY
Company EBA Signature [signature]
I authorize Exova to proceed with the work indicated on this form: ✓
Date: Nov. 16, 2010 Initial: ER

Received by:	Sample Temp.
Waybill #:	Date
Company	Time

Special Instructions / Comments

* Routine includes the following analyses:
  - ICSO
  - ICCL
  - ALK
  - TDS

Please indicate which regulations you are required to meet:
☐ Health Canada Drinking Water Quality
☐ Alberta Tier 1
☐ Other: _____

	Sample Identification	Location	Depth IN	Depth CM	Depth M	Date/Time Sampled	Matrix	Sampling Method	Number of Containers: W38BC	NUTR	Routine*	DOC	COD	CTEH6	VOW2BC	CUPH3	N3	NH3-N	hold
	DC-MW01	Deep Creek		—		Nov. 15	Water	Grab	✓	✓	✓	✓	✓	✓	✓	✓			
	DC-MW02	↓		—		↓	↓	↓	✓	✓	✓	✓	✓	✓	✓				
	DC-MW03			—					✓	✓	✓	✓	✓	✓	✓				
	DC-QC01			—															✓
	DC-QC02	↓		—		↓	↓	↓	✓							✓	✓	✓	

Enter tests above (✓ relevant samples below)

NOTE: All hazardous samples must be labeled according to WHMIS guidelines.

Page 1 of 1

ED 077-00

Your Project #: W23101317 MONITORING WELL PRO.
Site: DEEP CREEK LANDFILL
Your C.O.C. #: F92384

Attention: Adam Seeley
EBA ENGINEERING CONSULTANTS LTD.
WHITEHORSE - Rebate
CALCITE BUSINESS CENTRE
UNIT 6, 151 INDUSTRIAL ROAD
WHITEHORSE, YT
CANADA Y1A 2V3

Report Date: 2010/12/07
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B0B2367
Received: 2010/11/17, 13:30

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/MTBE LH, VH, F1 SIM/MS	1	2010/11/18	2010/11/18	BBY8-SOP-00010	Based on EPA 8260C
Hardness (calculated as CaCO3)	1	N/A	2010/11/23		
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	1	N/A	2010/11/19	BRN SOP-00206	Based on EPA 200.8
Elements by CRC ICPMS (dissolved)	1	N/A	2010/11/22	BRN SOP-00206	Based on EPA 200.8
Ammonia-N	1	N/A	2010/11/18	BBY6SOP-00044	Based on EPA 350.1
Nitrate + Nitrite (N)	1	N/A	2010/11/18		Based on USEPA 353.2
Nitrite (N) by CFA	1	N/A	2010/11/18	BRN SOP-00233 R1.0	EPA 353.2
Nitrogen - Nitrate (as N)	1	N/A	2010/11/19	BBY6SOP-00010	Based on EPA 353.2
Filter and HNO3 Preserve for Metals	1	N/A	2010/11/17	BRN WI-00006 R1.0	Based on EPA 200.2

* Results relate only to the items tested.

Encryption Key

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

Amanda Hart, Burnaby Customer Service
Email: AHart@maxxam.ca
Phone# (604) 639-2605

==========

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

Total cover pages: 1

Maxxam Job #: B0B2367
Report Date: 2010/12/07

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: W23101317 MONITORING WELL PRO.
Site Reference: DEEP CREEK LANDFILL
Sampler Initials: ER

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		Y50240		
Sampling Date		2010/11/15		
	Units	**DC-QC03**	**RDL**	**QC Batch**
ANIONS				
Nitrite (N)	mg/L	<0.005	0.005	4438013
Calculated Parameters				
Filter and HNO3 Preservation	N/A	FIELD	N/A	ONSITE
Nitrate (N)	mg/L	<0.02	0.02	4432697
Nutrients				
Ammonia (N)	mg/L	0.089	0.005	4436127
Nitrate plus Nitrite (N)	mg/L	<0.02	0.02	4434551

BCCSR BTEX/VPH IN WATER (WATER)

Maxxam ID		Y50240		
Sampling Date		2010/11/15		
	Units	**DC-QC03**	**RDL**	**QC Batch**
Volatiles				
Methyl-tert-butylether (MTBE)	ug/L	<4	4	4435685
Benzene	ug/L	<0.4	0.4	4435685
Toluene	ug/L	<0.4	0.4	4435685
Ethylbenzene	ug/L	<0.4	0.4	4435685
m & p-Xylene	ug/L	<0.4	0.4	4435685
o-Xylene	ug/L	<0.4	0.4	4435685
Styrene	ug/L	<0.4	0.4	4435685
Xylenes (Total)	ug/L	<0.4	0.4	4435685
VH C6-C10	ug/L	<300	300	4435685
Surrogate Recovery (%)				
4-BROMOFLUOROBENZENE (sur.)	%	97		4435685
D4-1,2-DICHLOROETHANE (sur.)	%	95		4435685
D8-TOLUENE (sur.)	%	100		4435685

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Job #: B0B2367
Report Date: 2010/12/07

EBA ENGINEERING CONSULTANTS LTD.
Client Project #: W23101317 MONITORING WELL PRO.
Site Reference: DEEP CREEK LANDFILL
Sampler Initials: ER

CSR DISSOLVED METALS IN WATER (WATER)

Maxxam ID		Y50240		
Sampling Date		2010/11/15		
	Units	**DC-QC03**	**RDL**	**QC Batch**
Misc. Inorganics				
Dissolved Hardness (CaCO3)	mg/L	2540	0.5	4432512
Dissolved Metals by ICPMS				
Dissolved Aluminum (Al)	mg/L	<0.003	0.003	4440056
Dissolved Antimony (Sb)	mg/L	<0.0005	0.0005	4440056
Dissolved Arsenic (As)	mg/L	0.0086	0.0001	4440056
Dissolved Barium (Ba)	mg/L	0.013	0.001	4440056
Dissolved Beryllium (Be)	mg/L	<0.0001	0.0001	4440056
Dissolved Bismuth (Bi)	mg/L	<0.001	0.001	4440056
Dissolved Boron (B)	mg/L	<0.05	0.05	4440056
Dissolved Cadmium (Cd)	mg/L	0.00001	0.00001	4440056
Dissolved Chromium (Cr)	mg/L	<0.001	0.001	4440056
Dissolved Cobalt (Co)	mg/L	0.0009	0.0005	4440056
Dissolved Copper (Cu)	mg/L	0.0064	0.0002	4440056
Dissolved Iron (Fe)	mg/L	1.16	0.005	4440056
Dissolved Lead (Pb)	mg/L	<0.0002	0.0002	4440056
Dissolved Lithium (Li)	mg/L	0.025	0.005	4440056
Dissolved Manganese (Mn)	mg/L	0.090	0.001	4440056
Dissolved Mercury (Hg)	mg/L	0.00004	0.00002	4440056
Dissolved Molybdenum (Mo)	mg/L	0.003	0.001	4440056
Dissolved Nickel (Ni)	mg/L	0.005	0.001	4440056
Dissolved Selenium (Se)	mg/L	<0.0001	0.0001	4440056
Dissolved Silicon (Si)	mg/L	8.1	0.1	4440056
Dissolved Silver (Ag)	mg/L	<0.00002	0.00002	4440056
Dissolved Strontium (Sr)	mg/L	4.18	0.001	4440056
Dissolved Thallium (Tl)	mg/L	<0.00005	0.00005	4440056
Dissolved Tin (Sn)	mg/L	<0.005	0.005	4440056
Dissolved Titanium (Ti)	mg/L	<0.005	0.005	4440056
Dissolved Uranium (U)	mg/L	0.0068	0.0001	4440056
Dissolved Vanadium (V)	mg/L	<0.005	0.005	4440056
Dissolved Zinc (Zn)	mg/L	0.009	0.005	4440056
Dissolved Zirconium (Zr)	mg/L	<0.0005	0.0005	4440056
Dissolved Calcium (Ca)	mg/L	224	0.05	4432513
Dissolved Magnesium (Mg)	mg/L	480	0.05	4432513
Dissolved Potassium (K)	mg/L	3.78	0.05	4432513
Dissolved Sodium (Na)	mg/L	60.8	0.05	4432513
Dissolved Sulphur (S)	mg/L	717	3	4432513

RDL = Reportable Detection Limit

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Package 1	4.7°C

Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Maxxam Job #: B0B2367
Report Date: 2010/12/07

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Client Project #: W23101317 MONITORING WELL PRO.
Site Reference: DEEP CREEK LANDFILL
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QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4434551	Nitrate plus Nitrite (N)	2010/11/18	110	80 - 120	100	80 - 120	<0.02	mg/L	NC	25		
4435685	4-BROMOFLUOROBENZENE (sur.)	2010/11/18	97	70 - 130	98	70 - 130	96	%			97	70 - 130
4435685	D4-1,2-DICHLOROETHANE (sur.)	2010/11/18	94	70 - 130	96	70 - 130	99	%			94	70 - 130
4435685	D8-TOLUENE (sur.)	2010/11/18	99	70 - 130	99	70 - 130	99	%			101	70 - 130
4435685	Methyl-tert-butylether(MTBE)	2010/11/18	107	70 - 130	97	70 - 130	<4	ug/L				
4435685	Benzene	2010/11/18	119	70 - 130	107	70 - 130	<0.4	ug/L	2.7	30		
4435685	Toluene	2010/11/18	114	70 - 130	102	70 - 130	<0.4	ug/L	NC	30		
4435685	Ethylbenzene	2010/11/18	112	70 - 130	101	70 - 130	<0.4	ug/L	0	30		
4435685	m & p-Xylene	2010/11/18	98	70 - 130	90	70 - 130	<0.4	ug/L	NC	30		
4435685	o-Xylene	2010/11/18	114	70 - 130	103	70 - 130	<0.4	ug/L	2.5	30		
4435685	Styrene	2010/11/18	119	70 - 130	111	70 - 130	<0.4	ug/L				
4435685	VH C6-C10	2010/11/18					<300	ug/L			93	70 - 130
4435685	Xylenes (Total)	2010/11/18					<0.4	ug/L	2.7	30		
4436127	Ammonia (N)	2010/11/18	93	80 - 120	98	80 - 120	<0.005	mg/L	NC	20		
4438013	Nitrite (N)	2010/11/18	115	80 - 120	101	80 - 120	<0.005	mg/L	NC	20		
4440056	Dissolved Arsenic (As)	2010/11/22	102	80 - 120	99	80 - 120	<0.0001	mg/L	9.4	20		
4440056	Dissolved Beryllium (Be)	2010/11/22	111	80 - 120	101	80 - 120	<0.0001	mg/L	NC	20		
4440056	Dissolved Cadmium (Cd)	2010/11/22	NC	80 - 120	102	80 - 120	<0.00001	mg/L	2.2	20		
4440056	Dissolved Chromium (Cr)	2010/11/22	102	80 - 120	99	80 - 120	<0.001	mg/L	NC	20		
4440056	Dissolved Cobalt (Co)	2010/11/22	104	80 - 120	101	80 - 120	<0.0005	mg/L	3.0	20		
4440056	Dissolved Copper (Cu)	2010/11/22	NC	80 - 120	108	80 - 120	0.0002, RDL=0.0002	mg/L	10.1	20		
4440056	Dissolved Lead (Pb)	2010/11/22	NC	80 - 120	104	80 - 120	<0.0002	mg/L	1.4	20		
4440056	Dissolved Lithium (Li)	2010/11/22	114	80 - 120	104	80 - 120	<0.005	mg/L	NC	20		
4440056	Dissolved Nickel (Ni)	2010/11/22	NC	80 - 120	100	80 - 120	<0.001	mg/L	5.9	20		
4440056	Dissolved Selenium (Se)	2010/11/22	109	80 - 120	103	80 - 120	<0.0001	mg/L	NC	20		
4440056	Dissolved Uranium (U)	2010/11/22	105	80 - 120	104	80 - 120	<0.0001	mg/L	NC	20		
4440056	Dissolved Vanadium (V)	2010/11/22	104	80 - 120	99	80 - 120	<0.005	mg/L	NC	20		
4440056	Dissolved Zinc (Zn)	2010/11/22	NC	80 - 120	103	80 - 120	<0.005	mg/L	1.1	20		
4440056	Dissolved Aluminum (Al)	2010/11/22					<0.003	mg/L	NC	20		
4440056	Dissolved Antimony (Sb)	2010/11/22					<0.0005	mg/L	2.5	20		
4440056	Dissolved Barium (Ba)	2010/11/22					<0.001	mg/L	0.9	20		
4440056	Dissolved Bismuth (Bi)	2010/11/22					<0.001	mg/L	NC	20		
4440056	Dissolved Boron (B)	2010/11/22					<0.05	mg/L	NC	20		
4440056	Dissolved Iron (Fe)	2010/11/22					<0.005	mg/L	1.7	20		
4440056	Dissolved Manganese (Mn)	2010/11/22					<0.001	mg/L	1.3	20		
4440056	Dissolved Mercury (Hg)	2010/11/22					<0.00002	mg/L				
4440056	Dissolved Molybdenum (Mo)	2010/11/22					<0.001	mg/L	NC	20		
4440056	Dissolved Silicon (Si)	2010/11/22					<0.1	mg/L	0.6	20		
4440056	Dissolved Silver (Ag)	2010/11/22					<0.00002	mg/L	NC	20		
4440056	Dissolved Strontium (Sr)	2010/11/22					<0.001	mg/L	1.0	20		

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QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4440056	Dissolved Thallium (Tl)	2010/11/22					<0.00005	mg/L	NC	20		
4440056	Dissolved Tin (Sn)	2010/11/22					<0.005	mg/L	NC	20		
4440056	Dissolved Titanium (Ti)	2010/11/22					<0.005	mg/L	NC	20		
4440056	Dissolved Zirconium (Zr)	2010/11/22					<0.0005	mg/L	NC	20		

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

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8577 Commerce Court
Burnaby, BC V5A 4N5
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Phone: (604) 444-4808
Fax: (604) 444-4511
Toll Free: 1-800-440-4808

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

B0B23167 ANALYSIS REQUEST F 92384

COMPANY NAME: EBA Engineering

PH. #: 867 668 2071 x243
E-mail: aseeley@eba.ca
FAX #:

COMPANY ADDRESS: 6151 Industrial Rd. Whitehorse YT. Y1A 2V3

CLIENT PROJECT ID: (#) W23101317 Monitoring Well Prog. Deep Creek Landfill

SAMPLER NAME (PRINT): ÉLIANE ROY

PROJECT MANAGER: Adam Seeley

FIELD SAMPLE ID	MATRIX: GROUND WATER	MATRIX: SURFACE WATER	MATRIX: SOIL	MATRIX: OTHER	# CONTAINERS	SAMPLING: DATE DD/MM/YY	SAMPLING: TIME	SAMPLING: HEADSPACE VAPOUR	Dissolved metals	NO3	NH3	BTEX
1 DC-BG03	✓					Nov. 15	—	No.				
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

TAT (Turnaround Time)

<5 DAY TAT MUST HAVE PRIOR APPROVAL

*some exceptions apply please contact lab

STANDARD 5 BUSINESS DAYS ☑
RUSH 3 BUSINESS DAYS ☐
RUSH 2 BUSINESS DAYS ☐
URGENT 1 BUSINESS DAY ☐

OTHER BUSINESS DAYS _____

CUSTODY RECORD

P.O. NUMBER / QUOTE NUMBER:

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE:

☐ CCME
☑ CSR Yukon
☐ ALBERTA TIER 1
☐ OTHER

ACCOUNTING CONTACT:

SPECIAL REPORTING OR BILLING INSTRUCTIONS:

JARS USED:

ARRIVAL TEMPERATURE °C: 4 5 5

DUE DATE:

LOG IN CHECK:

RELINQUISHED BY SAMPLER: Éliane Roy	DATE: DD/MM/YY NOV/19/2018	TIME: 11:03 AM	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY 17 10 11	TIME: 1330	RECEIVED BY LABORATORY: C. Rosa

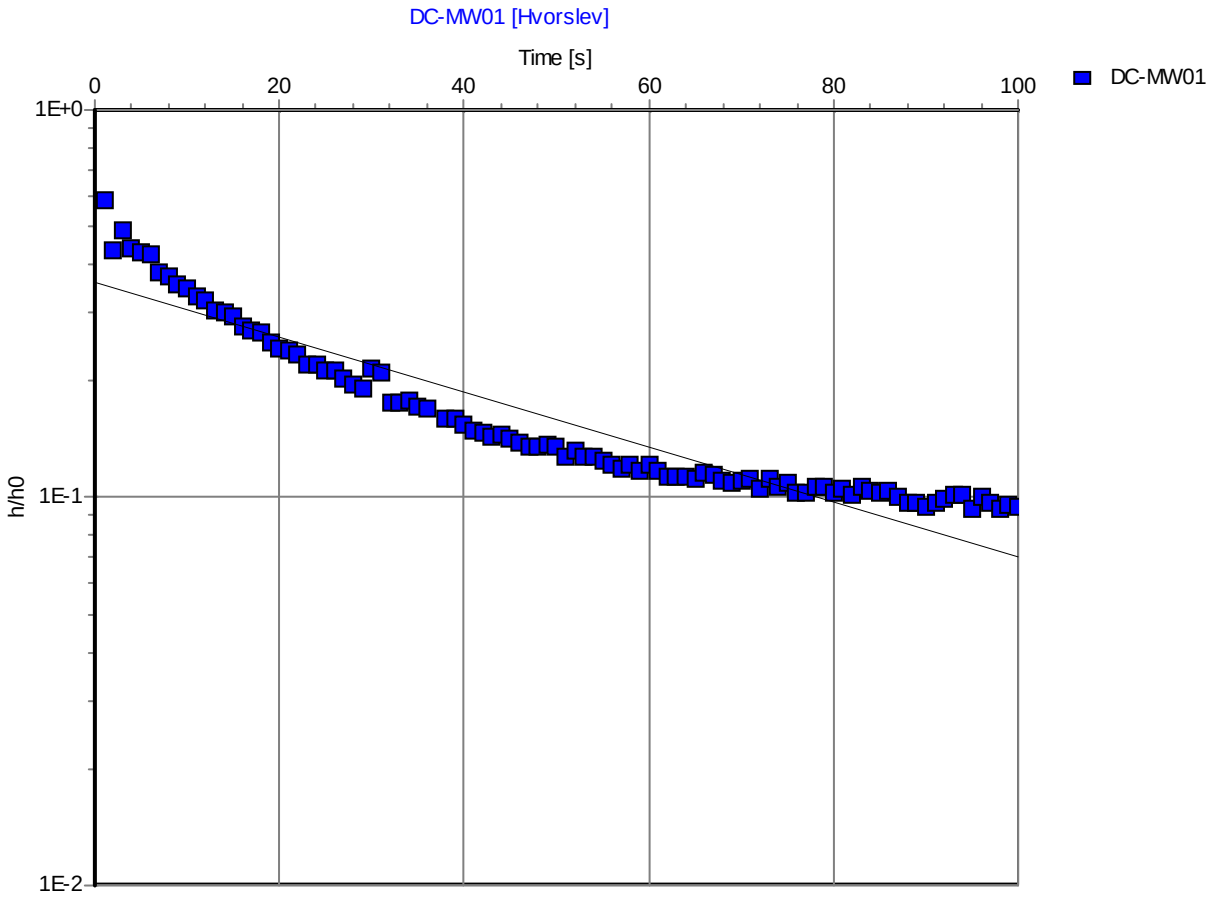
COCFORM - BC - 06/06

ORIGINAL - MAXXAM YELLOW - MAXXAM PINK - CLIENT

APPENDIX G

APPENDIX G HYDRAULIC RESPONSE TEST DATA AND ANALYSIS

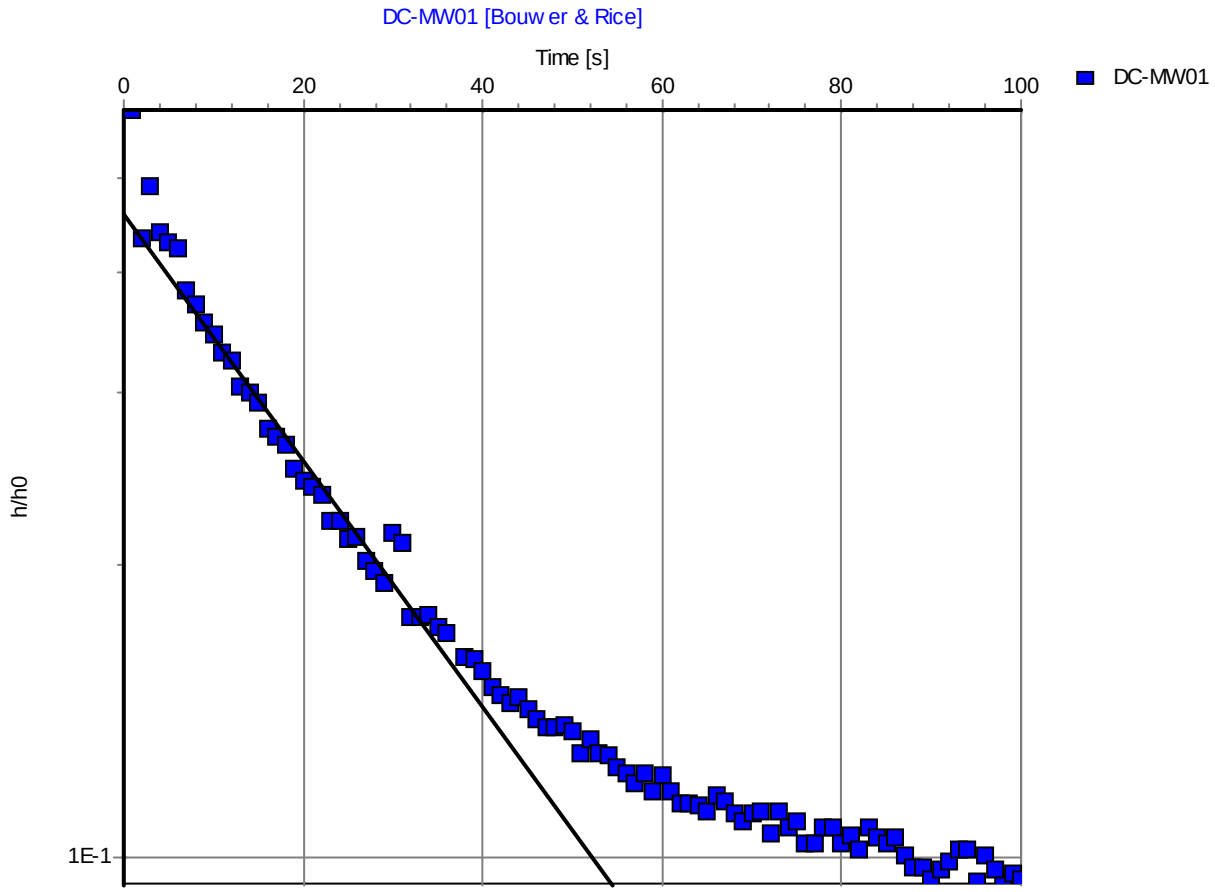
EBA Engineering Consultants Calcite Buisness Centre Unit 6, 151 Industrail Road Whitehorse, Yukon Y1A 2V3	**Slug Test Analysis Report** Number: W23101317 Project: 2010 Monitoring Program Client: Yukon Government
Location: Deep Creek	
Test performed by: Test date: 12/14/2010	Evaluated by: BCW Reviewed by: SK
Analysis Method: Hvorslev	



Conductivity: 4.83E-6 [m/s]

Comments:

EBA Engineering Consultants Calcite Buisness Centre Unit 6, 151 Industrail Road Whitehorse, Yukon Y1A 2V3	**Slug Test Analysis Report** Number: W23101317 Project: 2010 Monitoring Program Client: Yukon Government
Location: Deep Creek	
Test performed by: Test date: 12/14/2010	Evaluated by: BCW Reviewed by: SK
Analysis Method: Bouwer & Rice	



Conductivity: 6.81E-6 [m/s]

Comments:

2010 Monitoring Well Program

Serial Number 72942

Project ID W23101317

Location Deep Creek DC-MW01

Channel 1 Identification

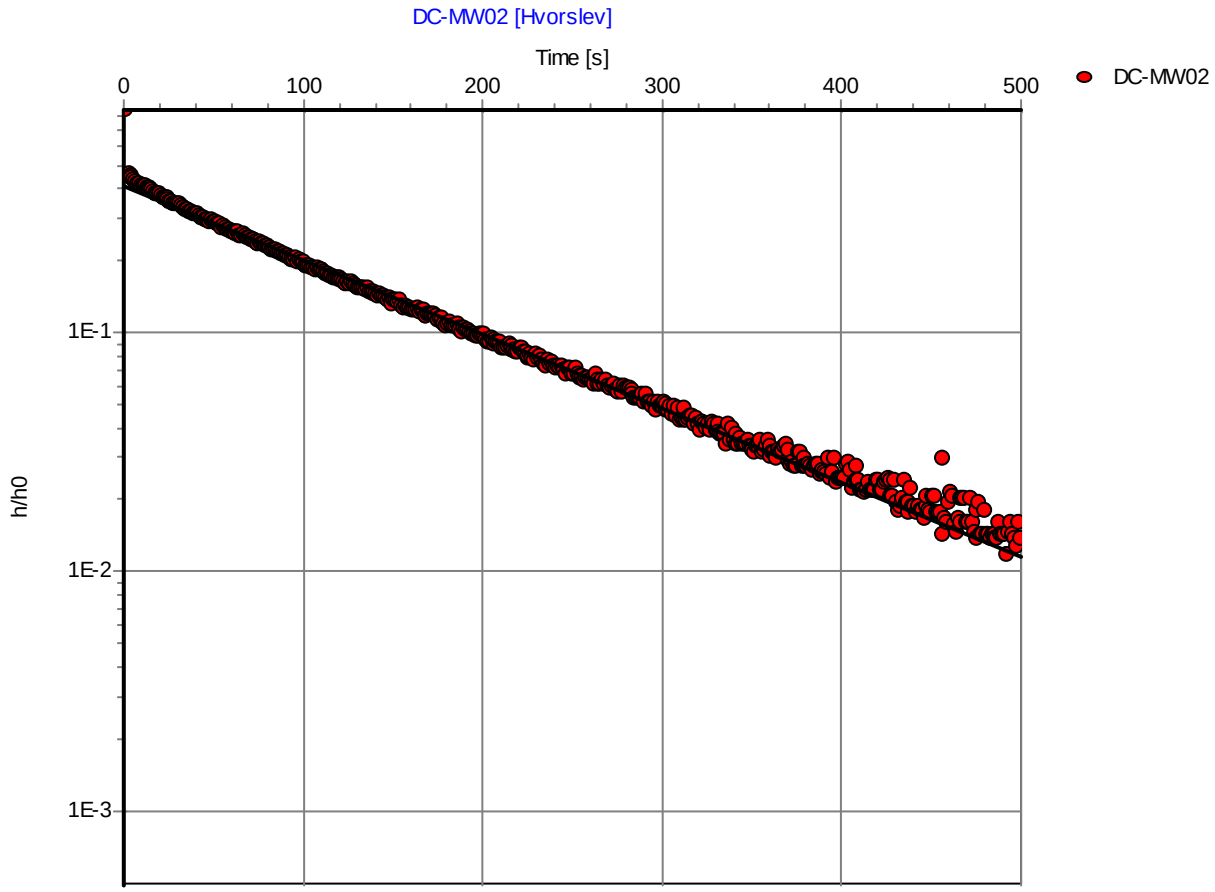
Static (m btoc) 3.34

Time	LEVEL	Seconds	Drawdown	Time	LEVEL	Seconds	Drawdown	Time	LEVEL	Seconds	Drawdown
15:47:32	1.896	0	1.444	15:48:38	3.173	66	0.167	15:49:44	3.22	132	0.12
15:47:33	2.492	1	0.848	15:48:39	3.175	67	0.165	15:49:45	3.221	133	0.119
15:47:34	2.715	2	0.625	15:48:40	3.18	68	0.16	15:49:46	3.22	134	0.12
15:47:35	2.632	3	0.708	15:48:41	3.183	69	0.157	15:49:47	3.22	135	0.12
15:47:36	2.704	4	0.636	15:48:42	3.18	70	0.16	15:49:48	3.217	136	0.123
15:47:37	2.72	5	0.62	15:48:43	3.179	71	0.161	15:49:49	3.225	137	0.115
15:47:38	2.728	6	0.612	15:48:44	3.187	72	0.153	15:49:50	3.22	138	0.12
15:47:39	2.788	7	0.552	15:48:45	3.179	73	0.161	15:49:51	3.217	139	0.123
15:47:40	2.805	8	0.535	15:48:46	3.185	74	0.155	15:49:52	3.225	140	0.115
15:47:41	2.827	9	0.513	15:48:47	3.183	75	0.157	15:49:53	3.224	141	0.116
15:47:42	2.841	10	0.499	15:48:48	3.191	76	0.149	15:49:54	3.225	142	0.115
15:47:43	2.863	11	0.477	15:48:49	3.191	77	0.149	15:49:55	3.223	143	0.117
15:47:44	2.871	12	0.469	15:48:50	3.185	78	0.155	15:49:56	3.221	144	0.119
15:47:45	2.899	13	0.441	15:48:51	3.185	79	0.155	15:49:57	3.215	145	0.125
15:47:46	2.905	14	0.435	15:48:52	3.191	80	0.149	15:49:58	3.225	146	0.115
15:47:47	2.916	15	0.424	15:48:53	3.188	81	0.152	15:49:59	3.217	147	0.123
15:47:48	2.941	16	0.399	15:48:54	3.193	82	0.147	15:50:00	3.219	148	0.121
15:47:49	2.949	17	0.391	15:48:55	3.185	83	0.155	15:50:01	3.217	149	0.123
15:47:50	2.956	18	0.384	15:48:56	3.189	84	0.151	15:50:02	3.225	150	0.115
15:47:51	2.977	19	0.363	15:48:57	3.191	85	0.149	15:50:03	3.22	151	0.12
15:47:52	2.988	20	0.352	15:48:58	3.189	86	0.151	15:50:04	3.219	152	0.121
15:47:53	2.992	21	0.348	15:48:59	3.195	87	0.145	15:50:05	3.223	153	0.117
15:47:54	3	22	0.34	15:49:00	3.199	88	0.141	15:50:06	3.224	154	0.116
15:47:55	3.02	23	0.32	15:49:01	3.199	89	0.141	15:50:07	3.227	155	0.113
15:47:56	3.02	24	0.32	15:49:02	3.203	90	0.137	15:50:08	3.22	156	0.12
15:47:57	3.033	25	0.307	15:49:03	3.2	91	0.14	15:50:09	3.219	157	0.121
15:47:58	3.032	26	0.308	15:49:04	3.197	92	0.143	15:50:10	3.22	158	0.12
15:47:59	3.048	27	0.292	15:49:05	3.193	93	0.147	15:50:11	3.217	159	0.123
15:48:00	3.056	28	0.284	15:49:06	3.193	94	0.147	15:50:12	3.225	160	0.115
15:48:01	3.063	29	0.277	15:49:07	3.204	95	0.136	15:50:13	3.221	161	0.119
15:48:02	3.029	30	0.311	15:49:08	3.195	96	0.145	15:50:14	3.22	162	0.12
15:48:03	3.036	31	0.304	15:49:09	3.2	97	0.14	15:50:15	3.228	163	0.112
15:48:04	3.085	32	0.255	15:49:10	3.205	98	0.135	15:50:16	3.225	164	0.115
15:48:05	3.085	33	0.255	15:49:11	3.201	99	0.139	15:50:17	3.22	165	0.12
15:48:06	3.084	34	0.256	15:49:12	3.203	100	0.137	15:50:18	3.231	166	0.109
15:48:07	3.091	35	0.249	15:49:13	3.2	101	0.14	15:50:19	3.229	167	0.111
15:48:08	3.095	36	0.245	15:49:14	3.204	102	0.136	15:50:20	3.231	168	0.109
15:48:09	3.1	37	0.24	15:49:15	3.201	103	0.139	15:50:21	3.231	169	0.109
15:48:11	3.109	39	0.231	15:49:17	3.2	105	0.14	15:50:23	3.231	171	0.109
15:48:12	3.116	40	0.224	15:49:18	3.201	106	0.139	15:50:24	3.221	172	0.119
15:48:13	3.124	41	0.216	15:49:19	3.201	107	0.139	15:50:25	3.229	173	0.111
15:48:14	3.128	42	0.212	15:49:20	3.201	108	0.139	15:50:26	3.225	174	0.115
15:48:15	3.132	43	0.208	15:49:21	3.204	109	0.136	15:50:27	3.225	175	0.115
15:48:16	3.129	44	0.211	15:49:22	3.209	110	0.131	15:50:28	3.225	176	0.115
15:48:17	3.135	45	0.205	15:49:23	3.205	111	0.135	15:50:29	3.231	177	0.109
15:48:18	3.14	46	0.2	15:49:24	3.208	112	0.132	15:50:30	3.231	178	0.109
15:48:19	3.144	47	0.196	15:49:25	3.212	113	0.128	15:50:31	3.228	179	0.112
15:48:20	3.144	48	0.196	15:49:26	3.209	114	0.131	15:50:32	3.225	180	0.115
15:48:21	3.143	49	0.197	15:49:27	3.213	115	0.127	15:50:33	3.225	181	0.115
15:48:22	3.145	50	0.195	15:49:28	3.212	116	0.128	15:50:34	3.223	182	0.117
15:48:23	3.155	51	0.185	15:49:29	3.207	117	0.133	15:50:35	3.225	183	0.115
15:48:24	3.149	52	0.191	15:49:30	3.213	118	0.127	15:50:36	3.225	184	0.115
15:48:25	3.155	53	0.185	15:49:31	3.209	119	0.131	15:50:37	3.225	185	0.115
15:48:26	3.156	54	0.184	15:49:32	3.213	120	0.127	15:50:38	3.227	186	0.113
15:48:27	3.161	55	0.179	15:49:33	3.209	121	0.131	15:50:39	3.227	187	0.113
15:48:28	3.164	56	0.176	15:49:34	3.213	122	0.127	15:50:40	3.235	188	0.105
15:48:29	3.168	57	0.172	15:49:35	3.209	123	0.131	15:50:41	3.227	189	0.113
15:48:30	3.164	58	0.176	15:49:36	3.219	124	0.121	15:50:42	3.227	190	0.113
15:48:31	3.171	59	0.169	15:49:37	3.217	125	0.123	15:50:43	3.228	191	0.112
15:48:32	3.165	60	0.175	15:49:38	3.217	126	0.123	15:50:44	3.224	192	0.116
15:48:33	3.171	61	0.169	15:49:39	3.219	127	0.121	15:50:45	3.236	193	0.104
15:48:34	3.176	62	0.164	15:49:40	3.221	128	0.119	15:50:46	3.232	194	0.108
15:48:35	3.176	63	0.164	15:49:41	3.221	129	0.119	15:50:47	3.229	195	0.111
15:48:36	3.177	64	0.163	15:49:42	3.213	130	0.127	15:50:48	3.227	196	0.113
15:48:37	3.179	65	0.161	15:49:43	3.211	131	0.129	15:50:49	3.228	197	0.112

Time	LEVEL	Seconds	Drawdown	Time	LEVEL	Seconds	Drawdown	Time	LEVEL	Seconds	Drawdown
15:50:50	3.225	198	0.115	15:52:01	3.241	269	0.099	15:53:12	3.244	340	0.096
15:50:51	3.225	199	0.115	15:52:02	3.244	270	0.096	15:53:13	3.239	341	0.101
15:50:52	3.235	200	0.105	15:52:03	3.235	271	0.105	15:53:14	3.243	342	0.097
15:50:53	3.225	201	0.115	15:52:04	3.233	272	0.107	15:53:15	3.244	343	0.096
15:50:54	3.227	202	0.113	15:52:05	3.239	273	0.101	15:53:16	3.236	344	0.104
15:50:55	3.228	203	0.112	15:52:06	3.233	274	0.107	15:53:17	3.24	345	0.1
15:50:56	3.237	204	0.103	15:52:07	3.232	275	0.108	15:53:18	3.243	346	0.097
15:50:57	3.233	205	0.107	15:52:08	3.24	276	0.1	15:53:19	3.239	347	0.101
15:50:58	3.233	206	0.107	15:52:09	3.241	277	0.099	15:53:20	3.239	348	0.101
15:50:59	3.235	207	0.105	15:52:10	3.233	278	0.107	15:53:21	3.243	349	0.097
15:51:00	3.228	208	0.112	15:52:11	3.235	279	0.105	15:53:22	3.239	350	0.101
15:51:01	3.232	209	0.108	15:52:12	3.239	280	0.101	15:53:23	3.239	351	0.101
15:51:02	3.236	210	0.104	15:52:13	3.239	281	0.101	15:53:24	3.244	352	0.096
15:51:03	3.236	211	0.104	15:52:14	3.236	282	0.104	15:53:25	3.239	353	0.101
15:51:04	3.232	212	0.108	15:52:15	3.241	283	0.099	15:53:26	3.248	354	0.092
15:51:05	3.229	213	0.111	15:52:16	3.243	284	0.097	15:53:27	3.241	355	0.099
15:51:06	3.228	214	0.112	15:52:17	3.244	285	0.096	15:53:28	3.236	356	0.104
15:51:07	3.228	215	0.112	15:52:18	3.236	286	0.104	15:53:29	3.24	357	0.1
15:51:08	3.235	216	0.105	15:52:19	3.233	287	0.107	15:53:30	3.247	358	0.093
15:51:09	3.225	217	0.115	15:52:20	3.241	288	0.099	15:53:31	3.24	359	0.1
15:51:10	3.237	218	0.103	15:52:21	3.236	289	0.104	15:53:32	3.243	360	0.097
15:51:11	3.232	219	0.108	15:52:22	3.24	290	0.1	15:53:33	3.24	361	0.1
15:51:12	3.233	220	0.107	15:52:23	3.243	291	0.097	15:53:34	3.241	362	0.099
15:51:13	3.233	221	0.107	15:52:24	3.239	292	0.101	15:53:35	3.241	363	0.099
15:51:14	3.237	222	0.103	15:52:25	3.236	293	0.104	15:53:36	3.24	364	0.1
15:51:15	3.239	223	0.101	15:52:26	3.243	294	0.097	15:53:37	3.247	365	0.093
15:51:16	3.235	224	0.105	15:52:27	3.237	295	0.103	15:53:38	3.248	366	0.092
15:51:17	3.231	225	0.109	15:52:28	3.233	296	0.107	15:53:39	3.247	367	0.093
15:51:18	3.236	226	0.104	15:52:29	3.237	297	0.103	15:53:40	3.247	368	0.093
15:51:19	3.233	227	0.107	15:52:30	3.241	298	0.099	15:53:41	3.239	369	0.101
15:51:20	3.24	228	0.1	15:52:31	3.244	299	0.096	15:53:42	3.243	370	0.097
15:51:21	3.239	229	0.101	15:52:32	3.243	300	0.097	15:53:43	3.24	371	0.1
15:51:22	3.237	230	0.103	15:52:33	3.243	301	0.097	15:53:44	3.241	372	0.099
15:51:23	3.231	231	0.109	15:52:34	3.245	302	0.095	15:53:45	3.241	373	0.099
15:51:24	3.239	232	0.101	15:52:35	3.236	303	0.104	15:53:46	3.249	374	0.091
15:51:25	3.236	233	0.104	15:52:36	3.235	304	0.105	15:53:47	3.247	375	0.093
15:51:26	3.239	234	0.101	15:52:37	3.241	305	0.099	15:53:48	3.241	376	0.099
15:51:27	3.237	235	0.103	15:52:38	3.244	306	0.096	15:53:49	3.241	377	0.099
15:51:28	3.232	236	0.108	15:52:39	3.243	307	0.097	15:53:50	3.241	378	0.099
15:51:29	3.237	237	0.103	15:52:40	3.24	308	0.1	15:53:51	3.241	379	0.099
15:51:30	3.237	238	0.103	15:52:41	3.243	309	0.097	15:53:52	3.239	380	0.101
15:51:31	3.236	239	0.104	15:52:42	3.244	310	0.096	15:53:53	3.239	381	0.101
15:51:32	3.239	240	0.101	15:52:43	3.244	311	0.096	15:53:54	3.241	382	0.099
15:51:33	3.235	241	0.105	15:52:44	3.239	312	0.101	15:53:55	3.24	383	0.1
15:51:34	3.233	242	0.107	15:52:45	3.237	313	0.103	15:53:56	3.24	384	0.1
15:51:35	3.239	243	0.101	15:52:46	3.235	314	0.105	15:53:57	3.24	385	0.1
15:51:36	3.233	244	0.107	15:52:47	3.236	315	0.104	15:53:58	3.241	386	0.099
15:51:37	3.24	245	0.1	15:52:48	3.245	316	0.095	15:53:59	3.251	387	0.089
15:51:38	3.235	246	0.105	15:52:49	3.247	317	0.093	15:54:00	3.241	388	0.099
15:51:39	3.232	247	0.108	15:52:50	3.245	318	0.095	15:54:01	3.249	389	0.091
15:51:40	3.233	248	0.107	15:52:51	3.243	319	0.097	15:54:02	3.241	390	0.099
15:51:41	3.237	249	0.103	15:52:52	3.245	320	0.095	15:54:03	3.249	391	0.091
15:51:42	3.237	250	0.103	15:52:53	3.241	321	0.099	15:54:04	3.249	392	0.091
15:51:43	3.241	251	0.099	15:52:54	3.245	322	0.095	15:54:05	3.244	393	0.096
15:51:44	3.232	252	0.108	15:52:55	3.237	323	0.103	15:54:06	3.24	394	0.1
15:51:45	3.231	253	0.109	15:52:56	3.243	324	0.097	15:54:07	3.241	395	0.099
15:51:46	3.241	254	0.099	15:52:57	3.247	325	0.093	15:54:08	3.24	396	0.1
15:51:47	3.237	255	0.103	15:52:58	3.244	326	0.096	15:54:09	3.247	397	0.093
15:51:48	3.241	256	0.099	15:52:59	3.244	327	0.096	15:54:10	3.248	398	0.092
15:51:49	3.232	257	0.108	15:53:00	3.239	328	0.101	15:54:11	3.24	399	0.1
15:51:50	3.235	258	0.105	15:53:01	3.245	329	0.095	15:54:12	3.249	400	0.091
15:51:51	3.24	259	0.1	15:53:02	3.244	330	0.096	15:54:13	3.244	401	0.096
15:51:52	3.239	260	0.101	15:53:03	3.243	331	0.097	15:54:14	3.245	402	0.095
15:51:53	3.236	261	0.104	15:53:04	3.243	332	0.097	15:54:15	3.243	403	0.097
15:51:54	3.244	262	0.096	15:53:05	3.243	333	0.097	15:54:16	3.24	404	0.1
15:51:55	3.243	263	0.097	15:53:06	3.24	334	0.1	15:54:17	3.241	405	0.099
15:51:56	3.241	264	0.099	15:53:07	3.241	335	0.099	15:54:18	3.249	406	0.091
15:51:57	3.235	265	0.105	15:53:08	3.247	336	0.093	15:54:19	3.241	407	0.099
15:51:58	3.239	266	0.101	15:53:09	3.244	337	0.096	15:54:20	3.252	408	0.088
15:51:59	3.235	267	0.105	15:53:10	3.24	338	0.1	15:54:21	3.241	409	0.099
15:52:00	3.236	268	0.104	15:53:11	3.243	339	0.097	15:54:22	3.245	410	0.095

Time	LEVEL	Seconds	Drawdown
15:54:23	3.241	411	0.099
15:54:24	3.248	412	0.092
15:54:25	3.247	413	0.093
15:54:26	3.244	414	0.096
15:54:27	3.251	415	0.089
15:54:28	3.241	416	0.099
15:54:29	3.249	417	0.091
15:54:30	3.248	418	0.092
15:54:31	3.252	419	0.088
15:54:32	3.252	420	0.088
15:54:33	3.247	421	0.093
15:54:34	3.243	422	0.097
15:54:35	3.244	423	0.096
15:54:36	3.253	424	0.087
15:54:37	3.248	425	0.092
15:54:38	3.249	426	0.091
15:54:39	3.249	427	0.091
15:54:40	3.244	428	0.096
15:54:41	3.245	429	0.095
15:54:42	3.248	430	0.092
15:54:43	3.247	431	0.093
15:54:44	3.247	432	0.093
15:54:45	3.249	433	0.091
15:54:46	3.247	434	0.093
15:54:47	3.247	435	0.093
15:54:48	3.253	436	0.087
15:54:49	3.252	437	0.088
15:54:50	3.243	438	0.097
15:54:51	3.251	439	0.089
15:54:52	3.245	440	0.095
15:54:53	3.249	441	0.091
15:54:54	3.247	442	0.093
15:54:55	3.244	443	0.096
15:54:56	3.245	444	0.095
15:54:57	3.245	445	0.095
15:54:58	3.251	446	0.089
15:54:59	3.252	447	0.088
15:55:00	3.249	448	0.091
15:55:01	3.243	449	0.097
15:55:02	3.251	450	0.089
15:55:03	3.249	451	0.091
15:55:04	3.249	452	0.091
15:55:05	3.251	453	0.089
15:55:06	3.245	454	0.095
15:55:07	3.252	455	0.088
15:55:08	3.252	456	0.088
15:55:09	3.249	457	0.091
15:55:10	3.251	458	0.089
15:55:11	3.24	459	0.1
15:55:12	3.249	460	0.091
15:55:13	3.251	461	0.089
15:55:14	3.245	462	0.095
15:55:15	3.248	463	0.092
15:55:16	3.247	464	0.093
15:55:17	3.245	465	0.095
15:55:18	3.257	466	0.083
15:55:19	3.249	467	0.091
15:55:20	3.247	468	0.093
15:55:21	3.257	469	0.083
15:55:22	3.248	470	0.092
15:55:23	3.253	471	0.087
15:55:24	3.253	472	0.087
15:55:25	3.255	473	0.085
15:55:26	3.248	474	0.092
15:55:27	3.249	475	0.091
15:55:28	3.257	476	0.083
15:55:29	3.253	477	0.087
15:55:30	3.249	478	0.091
15:55:31	3.251	479	0.089
15:55:32	3.251	480	0.089
15:55:33	3.248	481	0.092
15:55:34	3.249	482	0.091
15:55:35	3.253	483	0.087
15:55:36	3.247	484	0.093
15:55:37	3.249	485	0.091
15:55:38	3.253	486	0.087
15:55:39	3.253	487	0.087
15:55:40	3.253	488	0.087
15:55:41	3.249	489	0.091
15:55:42	3.248	490	0.092
15:55:43	3.259	491	0.081
15:55:44	3.256	492	0.084
15:55:45	3.255	493	0.085
15:55:46	3.257	494	0.083
15:55:47	3.257	495	0.083
15:55:48	3.256	496	0.084
15:55:49	3.253	497	0.087
15:55:50	3.255	498	0.085
15:55:51	3.257	499	0.083
15:55:52	3.247	500	0.093

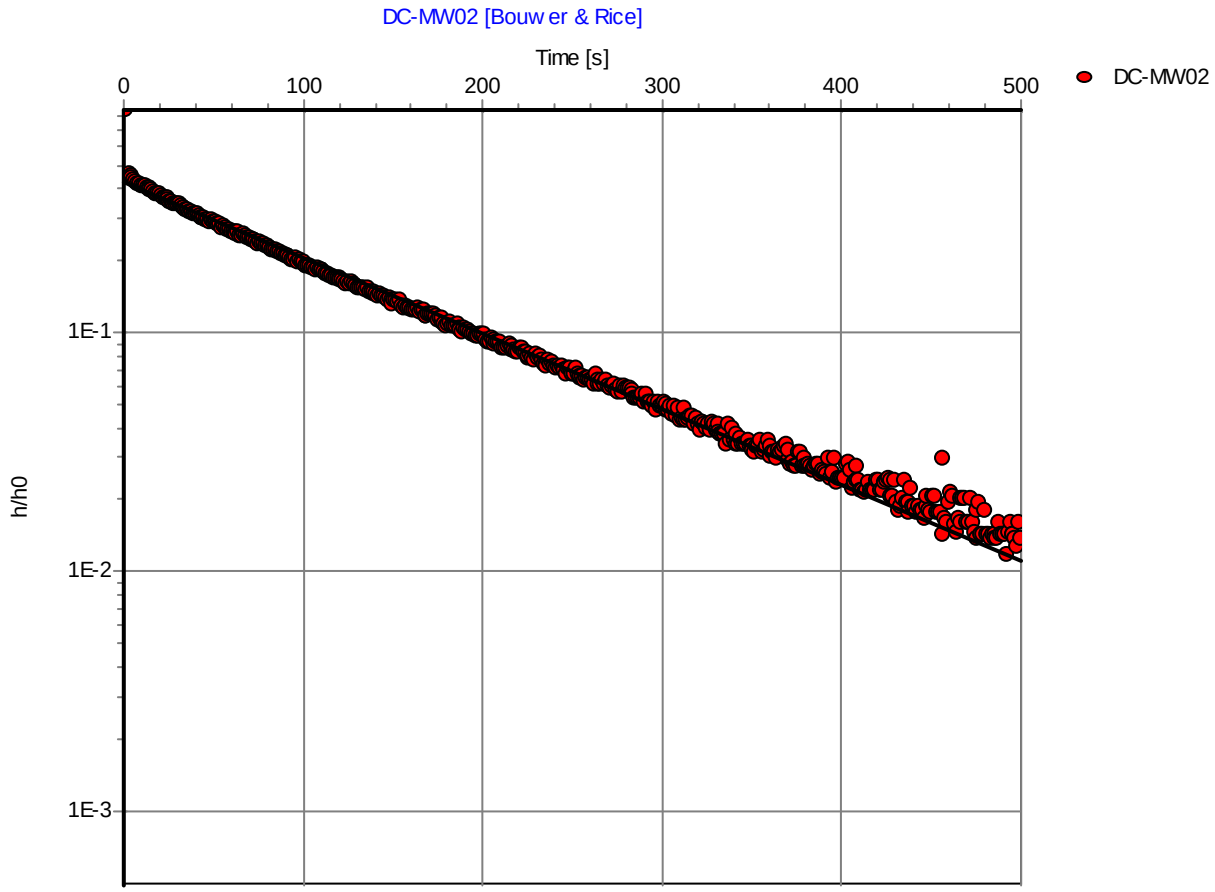
EBA Engineering Consultants Calcite Buisness Centre Unit 6, 151 Industrail Road Whitehorse, Yukon Y1A 2V3	**Slug Test Analysis Report** Number: W23101317 Project: 2010 Monitoring Program Client: Yukon Government
Location: Deep Creek	
Test performed by: Test date: 12/14/2010	Evaluated by: BCW Reviewed by: SK
Analysis Method: Hvorslev	



Conductivity: 2.45E-6 [m/s]

Comments:

EBA Engineering Consultants Calcite Buisness Centre Unit 6, 151 Industrail Road Whitehorse, Yukon Y1A 2V3	**Slug Test Analysis Report** Number: W23101317 Project: 2010 Monitoring Program Client: Yukon Government
Location: Deep Creek	
Test performed by: Test date: 12/14/2010	Evaluated by: BCW Reviewed by: SK
Analysis Method: Bouwer & Rice	



Conductivity: 2.10E-6 [m/s]

Comments:

2010 Monitoring Well Program
Serial Number 72942
Project ID W23101317

Location Deep Creek DC-MW02

Channel 1 Identification
Static (m btoc) 3.625

Time	LEVEL	Seconds	Drawdown	Time	LEVEL	Seconds	Drawdown	Time	LEVEL	Seconds	Drawdown
13:34:31	1.576	0	2.049	13:35:37	3.105	66	0.52	13:36:43	3.313	132	0.312
13:34:32	1.88	1	1.745	13:35:38	3.1	67	0.525	13:36:44	3.313	133	0.312
13:34:33	2.695	2	0.93	13:35:39	3.107	68	0.518	13:36:45	3.312	134	0.313
13:34:34	2.692	3	0.933	13:35:40	3.116	69	0.509	13:36:46	3.317	135	0.308
13:34:35	2.701	4	0.924	13:35:41	3.119	70	0.506	13:36:47	3.313	136	0.312
13:34:36	2.723	5	0.902	13:35:42	3.128	71	0.497	13:36:48	3.321	137	0.304
13:34:37	2.737	6	0.888	13:35:43	3.129	72	0.496	13:36:49	3.325	138	0.3
13:34:38	2.753	7	0.872	13:35:44	3.127	73	0.498	13:36:50	3.328	139	0.297
13:34:39	2.763	8	0.862	13:35:45	3.14	74	0.485	13:36:51	3.324	140	0.301
13:34:40	2.771	9	0.854	13:35:46	3.144	75	0.481	13:36:52	3.331	141	0.294
13:34:41	2.781	10	0.844	13:35:47	3.14	76	0.485	13:36:53	3.333	142	0.292
13:34:42	2.787	11	0.838	13:35:48	3.144	77	0.481	13:36:54	3.331	143	0.294
13:34:43	2.792	12	0.833	13:35:49	3.145	78	0.48	13:36:55	3.337	144	0.288
13:34:44	2.801	13	0.824	13:35:50	3.157	79	0.468	13:36:56	3.332	145	0.293
13:34:45	2.809	14	0.816	13:35:51	3.156	80	0.469	13:36:57	3.341	146	0.284
13:34:46	2.817	15	0.808	13:35:52	3.164	81	0.461	13:36:58	3.347	147	0.278
13:34:47	2.825	16	0.8	13:35:53	3.167	82	0.458	13:36:59	3.343	148	0.282
13:34:48	2.839	17	0.786	13:35:54	3.171	83	0.454	13:37:00	3.347	149	0.278
13:34:49	2.848	18	0.777	13:35:55	3.173	84	0.452	13:37:01	3.355	150	0.27
13:34:50	2.853	19	0.772	13:35:56	3.175	85	0.45	13:37:02	3.344	151	0.281
13:34:51	2.852	20	0.773	13:35:57	3.184	86	0.441	13:37:03	3.347	152	0.278
13:34:52	2.868	21	0.757	13:35:58	3.184	87	0.441	13:37:04	3.349	153	0.276
13:34:53	2.876	22	0.749	13:35:59	3.188	88	0.437	13:37:05	3.347	154	0.278
13:34:54	2.883	23	0.742	13:36:00	3.192	89	0.433	13:37:06	3.359	155	0.266
13:34:55	2.884	24	0.741	13:36:01	3.196	90	0.429	13:37:07	3.364	156	0.261
13:34:56	2.897	25	0.728	13:36:02	3.2	91	0.425	13:37:08	3.361	157	0.264
13:34:57	2.904	26	0.721	13:36:03	3.201	92	0.424	13:37:09	3.368	158	0.257
13:34:58	2.9	27	0.725	13:36:04	3.204	93	0.421	13:37:10	3.368	159	0.257
13:34:59	2.916	28	0.709	13:36:05	3.212	94	0.413	13:37:11	3.368	160	0.257
13:35:00	2.915	29	0.71	13:36:06	3.212	95	0.413	13:37:12	3.371	161	0.254
13:35:01	2.925	30	0.7	13:36:07	3.208	96	0.417	13:37:13	3.373	162	0.252
13:35:02	2.923	31	0.702	13:36:08	3.219	97	0.406	13:37:14	3.373	163	0.252
13:35:03	2.928	32	0.697	13:36:09	3.215	98	0.41	13:37:15	3.368	164	0.257
13:35:04	2.944	33	0.681	13:36:10	3.224	99	0.401	13:37:16	3.377	165	0.248
13:35:05	2.943	34	0.682	13:36:11	3.228	100	0.397	13:37:17	3.372	166	0.253
13:35:06	2.957	35	0.668	13:36:12	3.225	101	0.4	13:37:18	3.373	167	0.252
13:35:07	2.963	36	0.662	13:36:13	3.236	102	0.389	13:37:19	3.384	168	0.241
13:35:08	2.968	37	0.657	13:36:14	3.236	103	0.389	13:37:20	3.385	169	0.24
13:35:09	2.975	38	0.65	13:36:15	3.241	104	0.384	13:37:21	3.38	170	0.245
13:35:10	2.98	39	0.645	13:36:16	3.243	105	0.382	13:37:22	3.381	171	0.244
13:35:11	2.979	40	0.646	13:36:17	3.243	106	0.382	13:37:23	3.383	172	0.242
13:35:12	2.989	41	0.636	13:36:18	3.249	107	0.376	13:37:24	3.383	173	0.242
13:35:13	2.997	42	0.628	13:36:19	3.244	108	0.381	13:37:25	3.384	174	0.241
13:35:14	3.004	43	0.621	13:36:20	3.255	109	0.37	13:37:26	3.393	175	0.232
13:35:15	3.005	44	0.62	13:36:21	3.253	110	0.372	13:37:27	3.389	176	0.236
13:35:16	3.007	45	0.618	13:36:22	3.252	111	0.373	13:37:28	3.4	177	0.225
13:35:17	3.017	46	0.608	13:36:23	3.261	112	0.364	13:37:29	3.392	178	0.233
13:35:18	3.023	47	0.602	13:36:24	3.263	113	0.362	13:37:30	3.404	179	0.221
13:35:19	3.028	48	0.597	13:36:25	3.269	114	0.356	13:37:31	3.407	180	0.218
13:35:20	3.024	49	0.601	13:36:26	3.272	115	0.353	13:37:32	3.405	181	0.22
13:35:21	3.029	50	0.596	13:36:27	3.273	116	0.352	13:37:33	3.4	182	0.225
13:35:22	3.033	51	0.592	13:36:28	3.277	117	0.348	13:37:34	3.408	183	0.217
13:35:23	3.045	52	0.58	13:36:29	3.277	118	0.348	13:37:35	3.409	184	0.216
13:35:24	3.048	53	0.577	13:36:30	3.28	119	0.345	13:37:36	3.408	185	0.217
13:35:25	3.048	54	0.577	13:36:31	3.283	120	0.342	13:37:37	3.405	186	0.22
13:35:26	3.061	55	0.564	13:36:32	3.287	121	0.338	13:37:38	3.413	187	0.212
13:35:27	3.06	56	0.565	13:36:33	3.285	122	0.34	13:37:39	3.417	188	0.208
13:35:28	3.065	57	0.56	13:36:34	3.292	123	0.333	13:37:40	3.42	189	0.205
13:35:29	3.075	58	0.55	13:36:35	3.296	124	0.329	13:37:41	3.413	190	0.212
13:35:30	3.076	59	0.549	13:36:36	3.293	125	0.332	13:37:42	3.417	191	0.208
13:35:31	3.083	60	0.542	13:36:37	3.297	126	0.328	13:37:43	3.417	192	0.208
13:35:32	3.085	61	0.54	13:36:38	3.292	127	0.333	13:37:44	3.421	193	0.204
13:35:33	3.084	62	0.541	13:36:39	3.301	128	0.324	13:37:45	3.425	194	0.2
13:35:34	3.093	63	0.532	13:36:40	3.305	129	0.32	13:37:46	3.425	195	0.2
13:35:35	3.091	64	0.534	13:36:41	3.307	130	0.318	13:37:47	3.428	196	0.197
13:35:36	3.103	65	0.522	13:36:42	3.309	131	0.316	13:37:48	3.429	197	0.196

Time	LEVEL	Seconds	Drawdown	Time	LEVEL	Seconds	Drawdown	Time	LEVEL	Seconds	Drawdown
13:37:49	3.429	198	0.196	13:40:18	3.556	347	0.069				
13:37:50	3.424	199	0.201	13:39:03	3.504	272	0.121	13:40:19	3.553	348	0.072
13:37:51	3.425	200	0.2	13:39:04	3.5	273	0.125	13:40:20	3.557	349	0.068
13:37:52	3.425	201	0.2	13:39:05	3.508	274	0.117	13:40:21	3.557	350	0.068
13:37:53	3.436	202	0.189	13:39:06	3.508	275	0.117	13:40:22	3.559	351	0.066
13:37:54	3.437	203	0.188	13:39:07	3.511	276	0.114	13:40:23	3.56	352	0.065
13:37:55	3.437	204	0.188	13:39:08	3.504	277	0.121	13:40:24	3.557	353	0.068
13:37:56	3.433	205	0.192	13:39:09	3.511	278	0.114	13:40:25	3.557	354	0.068
13:37:57	3.441	206	0.184	13:39:10	3.503	279	0.122	13:40:26	3.553	355	0.072
13:37:58	3.436	207	0.189	13:39:11	3.505	280	0.12	13:40:27	3.56	356	0.065
13:37:59	3.437	208	0.188	13:39:12	3.505	281	0.12	13:40:28	3.559	357	0.066
13:38:00	3.437	209	0.188	13:39:13	3.505	282	0.12	13:40:29	3.557	358	0.068
13:38:01	3.437	210	0.188	13:39:14	3.508	283	0.117	13:40:30	3.552	359	0.073
13:38:02	3.448	211	0.177	13:39:15	3.512	284	0.113	13:40:31	3.563	360	0.062
13:38:03	3.448	212	0.177	13:39:16	3.517	285	0.108	13:40:32	3.557	361	0.068
13:38:04	3.448	213	0.177	13:39:17	3.517	286	0.108	13:40:33	3.561	362	0.064
13:38:05	3.445	214	0.18	13:39:18	3.517	287	0.108	13:40:34	3.56	363	0.065
13:38:06	3.444	215	0.181	13:39:19	3.517	288	0.108	13:40:35	3.564	364	0.061
13:38:07	3.451	216	0.174	13:39:20	3.513	289	0.112	13:40:36	3.559	365	0.066
13:38:08	3.445	217	0.18	13:39:21	3.521	290	0.104	13:40:37	3.56	366	0.065
13:38:09	3.453	218	0.172	13:39:22	3.513	291	0.112	13:40:38	3.559	367	0.066
13:38:10	3.455	219	0.17	13:39:23	3.52	292	0.105	13:40:39	3.557	368	0.068
13:38:11	3.455	220	0.17	13:39:24	3.521	293	0.104	13:40:40	3.556	369	0.069
13:38:12	3.449	221	0.176	13:39:25	3.52	294	0.105	13:40:41	3.565	370	0.06
13:38:13	3.449	222	0.176	13:39:26	3.525	295	0.1	13:40:42	3.559	371	0.066
13:38:14	3.456	223	0.169	13:39:27	3.52	296	0.105	13:40:43	3.568	372	0.057
13:38:15	3.457	224	0.168	13:39:28	3.528	297	0.097	13:40:44	3.567	373	0.058
13:38:16	3.464	225	0.161	13:39:29	3.52	298	0.105	13:40:45	3.569	374	0.056
13:38:17	3.463	226	0.162	13:39:30	3.525	299	0.1	13:40:46	3.569	375	0.056
13:38:18	3.459	227	0.166	13:39:31	3.525	300	0.1	13:40:47	3.56	376	0.065
13:38:19	3.464	228	0.161	13:39:32	3.52	301	0.105	13:40:48	3.561	377	0.064
13:38:20	3.468	229	0.157	13:39:33	3.528	302	0.097	13:40:49	3.569	378	0.056
13:38:21	3.46	230	0.165	13:39:34	3.523	303	0.102	13:40:50	3.564	379	0.061
13:38:22	3.464	231	0.161	13:39:35	3.528	304	0.097	13:40:51	3.569	380	0.056
13:38:23	3.463	232	0.162	13:39:36	3.524	305	0.101	13:40:52	3.569	381	0.056
13:38:24	3.468	233	0.157	13:39:37	3.532	306	0.093	13:40:53	3.568	382	0.057
13:38:25	3.473	234	0.152	13:39:38	3.524	307	0.101	13:40:54	3.569	383	0.056
13:38:26	3.473	235	0.152	13:39:39	3.533	308	0.092	13:40:55	3.571	384	0.054
13:38:27	3.477	236	0.148	13:39:40	3.527	309	0.098	13:40:56	3.569	385	0.056
13:38:28	3.468	237	0.157	13:39:41	3.537	310	0.088	13:40:57	3.568	386	0.057
13:38:29	3.473	238	0.152	13:39:42	3.535	311	0.09	13:40:58	3.568	387	0.057
13:38:30	3.471	239	0.154	13:39:43	3.527	312	0.098	13:40:59	3.573	388	0.052
13:38:31	3.476	240	0.149	13:39:44	3.537	313	0.088	13:41:00	3.572	389	0.053
13:38:32	3.48	241	0.145	13:39:45	3.537	314	0.088	13:41:01	3.571	390	0.054
13:38:33	3.477	242	0.148	13:39:46	3.535	315	0.09	13:41:02	3.572	391	0.053
13:38:34	3.48	243	0.145	13:39:47	3.533	316	0.092	13:41:03	3.573	392	0.052
13:38:35	3.476	244	0.149	13:39:48	3.533	317	0.092	13:41:04	3.564	393	0.061
13:38:36	3.483	245	0.142	13:39:49	3.541	318	0.084	13:41:05	3.575	394	0.05
13:38:37	3.483	246	0.142	13:39:50	3.535	319	0.09	13:41:06	3.572	395	0.053
13:38:38	3.488	247	0.137	13:39:51	3.54	320	0.085	13:41:07	3.564	396	0.061
13:38:39	3.481	248	0.144	13:39:52	3.545	321	0.08	13:41:08	3.577	397	0.048
13:38:40	3.48	249	0.145	13:39:53	3.539	322	0.086	13:41:09	3.575	398	0.05
13:38:41	3.489	250	0.136	13:39:54	3.539	323	0.086	13:41:10	3.575	399	0.05
13:38:42	3.487	251	0.138	13:39:55	3.54	324	0.085	13:41:11	3.575	400	0.05
13:38:43	3.481	252	0.144	13:39:56	3.543	325	0.082				
13:38:44	3.487	253	0.138	13:39:57	3.541	326	0.084				
13:38:45	3.493	254	0.132	13:39:58	3.545	327	0.08				
13:38:46	3.491	255	0.134	13:39:59	3.539	328	0.086				
13:38:47	3.492	256	0.133	13:40:00	3.54	329	0.085				
13:38:48	3.495	257	0.13	13:40:01	3.545	330	0.08				
13:38:49	3.493	258	0.132	13:40:02	3.54	331	0.085				
13:38:50	3.493	259	0.132	13:40:03	3.547	332	0.078				
13:38:51	3.496	260	0.129	13:40:04	3.549	333	0.076				
13:38:52	3.497	261	0.128	13:40:05	3.548	334	0.077				
13:38:53	3.5	262	0.125	13:40:06	3.549	335	0.076				
13:38:54	3.489	263	0.136	13:40:07	3.555	336	0.07				
13:38:55	3.496	264	0.129	13:40:08	3.541	337	0.084				
13:38:56	3.5	265	0.125	13:40:09	3.552	338	0.073				
13:38:57	3.5	266	0.125	13:40:10	3.544	339	0.081				
13:38:58	3.495	267	0.13	13:40:11	3.552	340	0.073				
13:38:59	3.501	268	0.124	13:40:12	3.555	341	0.07				
13:39:00	3.495	269	0.13	13:40:13	3.548	342	0.077				
13:39:01	3.504	270	0.121	13:40:14	3.556	343	0.069				
13:39:02	3.505	271	0.12	13:40:15	3.551	344	0.074				
13:40:17	3.556	346	0.069	13:40:16	3.555	345	0.07				