TETRA TECH EBA

Hydrogeological Assessment
Eagle Plains Solid Waste Management Facility

PRESENTED TO

Government of Yukon, Site Assessment and Remediation Unit

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LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Yukon Government – Site Assessment and Remediation Unit and their agents. Tetra Tech EBA Inc. (Tetra Tech 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 Yukon Government – Site Assessment and Remediation Unit, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech EBA's Services Agreement. Tetra Tech EBA's General Conditions are provided in Appendix A of this report.

1.0 INTRODUCTION

Tetra Tech EBA Inc. (Tetra Tech EBA) was retained by the Government of Yukon (YG) – Site Assessment and Remediation Unit (SARU) under Standing Offer Agreement (SOA) No. SARU-2014-SOA-TETRA-TECH-EBA to install groundwater monitoring wells and conduct a hydrogeological assessment at the Eagle Plains Solid Waste Facility (SWF; herein referred to as the "Site"). The Site is located at approximately km 364 on the Dempster Highway, YT.

1.1 Purpose and Objectives

The purpose of the work was to provide professional and technical services for a hydrogeological assessment at the Site, including the installation and sampling of shallow monitoring wells within the supra-permafrost groundwater (active layer), ground temperature monitoring and surface water sampling. The work was conducted in accordance with the requirements of the Solid Waste Facility Permit (80-011). The scope of work was divided into the following tasks:

- Task 1 – Information Collection and Project Preparation
- Task 2 – Groundwater Monitoring Well Installation
- Task 3 – Groundwater Sampling
- Task 4 – Surface Water Sampling
- Task 5 – Data Analysis and Hydrogeological Assessment Report

1.2 Location of Study Area

The Eagle Plains SWF is located approximately 407 km north of the City of Dawson and 4 km south of Eagle Plains at 136°44' W, 66°19' N on a 15.4 ha reserve to the Government of Yukon (Disposition No. 106I07-008), see Figures 1 and 2.

2.0 PREVIOUS WORK AND BACKGROUND INFORMATION REVIEW

2.1 Background Geological, Hydrogeological and Permafrost Information

Golder (2012) prepared a preliminary hydrogeological assessment for the Eagle Plains SWF. This assessment was based on a desktop review of available information regarding the geological and hydrogeological conditions at the Site along with a site visit conducted in October 2011. The conceptual hydrogeological model developed by Golder (2012) consists of a regional sub-permafrost groundwater flow system in fractured bedrock with some seasonal flow within the active zone located at or near the ground surface. Shallow groundwater was identified to likely discharge into un-named streams and the Eagle River located down slope of the Site.

Additional intrusive work was conducted as part of the project documented in this report to confirm the conceptual hydrogeological model postulated by Golder (2012).

Tetra Tech EBA reviewed pertinent background information regarding the local surficial geological and permafrost conditions at the Site. This information included the report by Golder (2012), topographical and geological maps, and information from other projects conducted by Tetra Tech EBA in the Eagle Plains area (e.g., Tetra Tech EBA 2014). The information was used to assess geological and hydrogeological conditions at the Site and assist in the determination of potential drill sites and development of monitoring well specifications.

The main information gathered from Golder (2012), Tetra Tech EBA (2014), Yukon Ecoregions Working Group (2004), and other anecdotal information that affected the monitoring well locations and completion details are summarized below:

- No direct groundwater information is available for the Site.
- Overburden, if present, is very thin with a typical thickness of about less than 1 m.
- The Site is located in a region with continuous permafrost of significant thickness (>100 m).
- The active zone in undisturbed and vegetated areas is likely very thin (<1 m).
- The area of the SWF has been cleared and likely shows some permafrost degradation with an active zone that is more extensive compared to surrounding undisturbed areas. Anecdotal information suggests that the active zone may be in the order of up to 3 m thick.
- Groundwater flow is likely complex and controlled by the active zone thickness with no uniform flow direction. Monitoring wells should therefore be placed near and surrounding the main areas of potential environmental concern (e.g., burn trench).

2.2 Review of Waste Management Permit

The Facility's Waste Management Permit (Permit No: 80-011) was reviewed and used in conjunction with relevant background information to confirm monitoring requirements and develop a monitoring network in compliance with the permit. A summary of the main requirements of the permit pertinent to this hydrogeological assessment are outlined in Table 2-1.

Table 2-1: Summary of Current Permit Groundwater Monitoring Requirements

Site	Waste Management Permit No.	Permit Requires Groundwater Monitoring	Permit Requires Surface Water Monitoring	Permit Specifies Analyte List	Monitoring Schedule
Eagle Plains SWF	80-011	Yes	Yes	Yes	Twice per year (Spring and late Summer)

3.0 FIELD INVESTIGATIONS

3.1 Scope of Field Investigations

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

- Conduct site inspection with site operator;
- Seven boreholes were drilled by Boart Longyear using a sonic drill and six groundwater monitoring wells were installed under the supervision of Tetra Tech EBA on October 7 and 8, 2015. 15MW04, located near empty fuel drums, was decommissioned on October 8, 2015. 15MW01 and 15MW07 were developed on October 8 and 9, 2015, respectively;
- Thermistor cables were installed into each borehole with exception of 15MW07;
- Grab samples of drill cuttings were collected during the drilling and the headspace was measured for field screening purposed. A total of seven soil samples were collected from 15MW01, 15MW04, 15MW06 and MW07 and submitted for analysis;
- Groundwater was encountered in three wells, 15MW01, 15MW02 and 15MW07. A full sample was collected from 15MW01 and a partial sample was collected from 15MW07. There was not enough water in 15MW02 to sample. The water levels at each location were measured prior to purging and sampling and physicochemical field parameters were tested at each monitoring well during sampling.
- Surface water samples were collected at four locations (SW1 through SW4).
- All samples were sent to AGAT which is an accredited laboratory conforming to ISO/IEC 17025 for analysis of soil and water; and,
- Hydraulic response tests were conducted on 15MW01 on October 9, 2015 in order to estimate the hydraulic conductivity of the aquifer.

3.2 Site Inspection and Site Infrastructure

Tetra Tech EBA attempted to conduct a site inspection with the Site Operator, however the Site Operator was not available during the time we were on Site. The site plan was reviewed with the gas attendant who has lived and worked in Eagle Plains for nearly 30 years and was very familiar with the Site. He provided useful updates to the stockpiled waste and any changes in recent time. Figure 2 provides a site map of the existing facility infrastructure and layout, which is described as follows:

- The scrap metals stockpile in the north end of the Site;
- Municipal solid waste (MSW) burn trench, which was constructed in the mid 1970s, adjacent to scrap metals stockpile constructed from blasted/excavated bedrock (34 m x 9 m footprint, 2 m deep);
- Stockpiles of tires, empty drums, wood pallets, and household hazardous waste along the northern edge of the facility;
- Small stockpile of refrigerators, washing machines and dryers southeast of MSW burn trench;
- Calcium bags stored on pallets south east of the burn trench;

- Stockpiles of autobodies, white metals and culverts, reflectors, etc. along the southern edge of the facility.

Photographs from the site inspection are presented in the attached photo log.

The general site layout and infrastructure is described in more detail in Tetra Tech EBA (2014) and has not changed significantly from the 2014 assessment.

There were no obvious signs of any spills or other indication of soil contamination, including the CaCl2 storage area. However, snow cover during the site visit did not allow a more detailed site inspection to be conducted.

3.3 Groundwater Monitoring Well Network

Five groundwater monitoring wells were proposed to be installed at the Site to assess potential groundwater contamination sourced from the SWF. Well 15MW05 was targeted to characterize up-gradient/background groundwater conditions while 15MW01, 15MW02, 15MW03, and 15MW04 were aimed to assess potential impact to the groundwater quality sourced from the SWF and stockpiled waste at the site. Since the groundwater flow regime was expected to be complex and variable depending on the extent of the active zone, the monitoring wells were placed near and surrounding areas of potential environmental concern, such as the burn trench or the fuel drum storage area.

A total of six monitoring wells were installed on October 7 and 8, 2015 by Boart Longyear using a sonic drill under the direction of Tetra Tech EBA to establish a groundwater monitoring network. Well 15MW04 was installed on October 7, 2015, decommissioned on October 8, 2015, and replaced with 15MW07 on October 8, 2015. Hydrocarbon contamination was encountered in well 15MW04 during the installation. Upon discussion between Ms. Kirsten Hogan and Tetra Tech EBA, 15MW04 was decommissioned and backfilled with bentonite to eliminate any potential pathway for contaminants from the shallow perched water into deeper overburden or shallow bedrock. Well 15MW04 was replaced with a shallower well 15MW07 that was terminated at the low-permeability silt layer where contamination was encountered.

An additional monitoring well 15MW06 was installed approximately halfway between the drum storage area and the burn trench in a low traffic area.

A site plan showing the approximate monitoring well locations and key site features is provided in Figures 1 and 2. Note that these wells have not been surveyed for location and are only approximate based on coordinates measured using a hand-held GPS.

Each borehole was completed with a groundwater monitoring well and a ground temperature cable with the exception of 15MW07, which has no ground temperature cables. Two 10 m ground temperature cables with eight beads were installed at 15MW01 and 15MW03 and three 4 m cables with one single bead were installed at 15MW02, 15MW04 and 15MW06.

The borehole logs indicating observed lithology and monitoring well completion details are included in Appendix C. Table 1 summarizes the well completion details.

Groundwater was encountered in 15MW01, 15MW02 and 15MW07.

The lithology encountered was similar at all locations (Table 3-1) and consistent with mapped lithological interpretations. Each borehole profile generally consisted overburden (sand, gravel and fine grained silt) overlying oxidized sandstone and organic rich shale.

All monitoring wells were completed as follows:

- All monitoring were drilled and screens placed aiming to be screened within the active layer;
- Monitoring wells were completed with 25-mm diameter Schedule 40 PVC pipes;
- A 3 m long well screen (0.010-slot) was installed at all monitoring wells, except at MW07 where a 0.4 m screen was installed, with the intent to intersect potential seasonal groundwater within the active zone;
- 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 0.3 m above the well screen;
- A bentonite seal was installed in the annulus above the sand pack to prevent 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 with exception of 15MW07. The drilling contractor only had five casing protectors on site as that was the originally proposed number of monitoring wells. Tetra Tech EBA therefore recommends that the protective casing on 15MW07 be installed during the next sampling event.
- Each well where groundwater was encountered was developed by removing a minimum of three well volumes using a dedicated disposable bailer. Development logs are provided in Appendix D.
- Photographs of the completed monitoring wells are included in the attached photo log.

Table 3-1: Monitoring Well Construction Details

Well ID	Drilled Depth (m bg)	Aquifer Unit Monitored	Screened Interval (m bg)
15MW01	10.0	Shale and Sandstone	1.1 – 4.1
15MW02	4.0	Sand, Silt and Sandstone	0.9 – 3.9
15MW03	10.0	Shale and Sandstone	0.9 – 4.0
15MW05	4.0	Silt and Shale	1.1 – 4.1
15MW06	4.0	Shale and Sandstone	1.0 – 4.0
15MW07	1.35	Sand and Sand and Gravel	0.8 – 1.2

3.4 Monitoring Well Surveying

Tetra Tech EBA surveyed the vertical elevation of the top of the well PVC standpipe at each of the well locations on October 8, 2015. Elevations were surveyed relative to a local benchmark assigned an elevation of 100 m. The monitoring wells were not surveyed for location. Easting and northing shown in Table 3-2 were measured using a hand-held GPS.

Table 3-2: Monitoring Well Survey Information

Well ID	Easting	Northing	Top of PVC Elevation (m)	Stick up (m)	Depth to water (m btoc[1])	Groundwater Elevation (m)
15MW01	422126	7357847	101.59	0.81	4.57	97.02
15MW02	421971	7357891	98.39	1.00	4.72	93.67
15MW03	421941	7357949	97.01	0.9	Dry	-
15MW05	422286	7357815	100.71	0.82	Dry	-
15MW06	422006	7357913	99.11	0.83	Dry	-
15MW07	422047	7537933	100.20	0.92	1.75	98.45

3.5 Groundwater and Surface Water Sampling

Groundwater monitoring wells 15MW01 and 15MW07 were sampled by Tetra Tech EBA on October 10, 2015 using methods in accordance with Yukon Contaminated Sites Regulation (CSR) Protocol No. 7: *Groundwater Monitoring Well Installation and Sampling*.

Prior to sampling, the static water level was measured in each well, using an electric measuring tape. Using small diameter Teflon tubing and a peristaltic pump, the two wells were sampled using low flow techniques. Groundwater was purged from the well until the physicochemical parameters (pH, temperature, specific conductivity (SPC), dissolved oxygen (DO), and oxidation-reduction (redox) potential) stabilized and with constant drawdown within the well. Groundwater Development and Sampling Field Sheets are provided in Appendix D.

Due to very slow recharge rates, a complete sample could not be collected from 15MW07. BTEX, PAH and routine bottles were filled and submitted to the lab.

Surface water samples were collected as grab samples in four locations along unnamed creeks, SW1 through SW4 (Figure 1). These locations were selected based on regional topography of the area. Prior to sampling, physicochemical parameters including pH, temperature, SPC, DO and redox potential were measured and recorded. Surface Water Sampling Sheets are present 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 laboratory. Samples collected 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 laboratory (AGAT) under Chain of Custody and within appropriate holding times. The laboratory is certified by the Canadian Association for Laboratory Accreditation and are accredited as conforming to ISO/IEC 17025 for analysis.

The laboratory testing completed for the groundwater and surface water samples is summarized in Table 3-3 and Table 3-4, respectively. The list of analytes is in compliance with the requirements of the Site's Waste Disposal Facility Permit (Permit No. 80-011).

Table 3-3: Groundwater Monitoring Program Permit Requirements (2015)

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
15MW01	✓	✓	✓	✓	✓
15MW07	✓	✓	✓	✓	✓

Table 3-4: Surface Water Monitoring Program Permit Requirements (2015)

Sample ID	Ca, Mg, Na, K, Cl, SO_4, NO_3, NO_2, PO4	Total Metals, Hg, Hardness	Alkalinity, CO_3, HCO_3, pH, TDS, NH_3, DOC	VOCs, COD, BOD, TKN, EPH_{W10-19}	VH_{W6-10}, BTEX, PAHs
SW01	✓	✓	✓	✓	✓
SW02	✓	✓	✓	✓	✓
SW03	✓	✓	✓	✓	✓
SW04	✓	✓	✓	✓	✓

3.6 Soil Sampling

Field screening for hydrocarbons was performed on suspect soil samples by measuring headspace vapour readings using a MiniRAE 2000TM photoionization detector (PID), which measures the ionisable components of organic vapours. Soil samples for headspace vapour screening were placed into plastic bags, sealed, and allowed to volatilize for approximately 5 minutes. Vapour concentrations were then measured in parts per million (ppm) and recorded on the monitoring well log. These headspace vapour screening results are a semi-quantitative tool used to help identify potentially contaminated soils. However, given the local bedrock lithology with significant organic carbon content and the high temperatures caused by the sonic drilling, the PID readings may not be representative and may have yielded false high readings that are not related to anthropogenic soil contamination.

Soil samples for laboratory analysis were placed in sterile 120 mL glass jars with Teflon™ lined lids as supplied by the lab. Soil samples were packed tightly into the jars to help prevent loss of volatile organic compounds into the jar headspace. Clean new nitrile gloves were worn during each sampling event and changed between samples to prevent cross contamination.

Soils samples were collected in accordance with Contaminated Site Regulation Protocol No. 3: *Soil Sampling Procedures at Contaminated Sites*. PID readings can be found on borehole logs in Appendix C.

3.7 Rising Head Hydraulic Response Testing

A rising head test was performed on 15MW01 at the Site to estimate hydraulic conductivity of the aquifer in the vicinity of the well location. Tests could not be conducted on 15MW07 due to ice build-up within the PVC standpipe. The rising head test was performed by rapidly removing approximately 100 mL of water from the well using 25 mm diameter dedicated polyethylene bailers. The recovery response in the well was monitored using the electronic water level sounder until the water level had recovered to at least 95% 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.

4.0 RESULTS AND DISCUSSION

4.1 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.

Data validation is summarized in Table 4-1.

Table 4-1: Review of October 2015 Groundwater and Soil Sampling QA/QC

QA/QC Aspect	Evidence and Evaluation
Sample integrity	All samples were collected in new sample bottles provided by the laboratory (AGAT). All preservatives were also provided by the laboratory. The samples were shipped on ice with a Chain of Custody immediately following the completion of the fieldwork. All samples were received by the laboratory within appropriate holding times.
Field Procedures	Monitoring wells were sampled using dedicated Teflon tubing. All equipment that was re-used between wells was decontaminated using a three stage wash procedure (detergent, tap water, deionized water).
Calibration of Field Equipment	Calibration of field equipment was undertaken prior to each day of field work following the manufacturer instructions.
Blind Duplicates	Two blind duplicates sample was collected – one groundwater sampling from 15MW01 and one soil sample from 15MW01 from 9.8 to 10.0 m bg. All duplicate results are in reasonable agreement with the concentrations measured in the sample from the respective monitoring well (RPD<30%). The calculated RPD values are summarized in Tables 5 and 6 (attached).
Laboratory Internal QA/QC	Laboratory internal QA/QC is detailed within the laboratory reports (Appendix F). The laboratory showed acceptable testing frequency and results for method blanks, laboratory duplicates and matrix spikes.
Holding Times	All holding times for samples were in conformance with applicable ASTM and laboratory requirements.
Completeness of Test Program	The scope of work undertaken was generally consistent with the requirements of the Permit 80-011.
Laboratory Detection Limit	Laboratory reports indicate that the nominal detection limits for the October 2015 monitoring event were lower than the respective assessment criteria for all parameters, with exception of LEPH in surface water where the adjusted CSR-AW standard of 50 µg/L is slightly lower than the detection limit of 100 µg/L. However, all surface water samples showed LEPH concentrations below the detection limit and did not contain any other detectable hydrocarbons.
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 this assessment is considered valid and complete.

4.2 Application of Applicable Water Quality Standards

For the purposes of this report, potential receptor categories are limited to the following water uses: Drinking Water, Aquatic Life, Irrigation, and Livestock – as defined by the Yukon Contaminated Sites Regulation (CSR) Schedule 3. Table 4-2 summarizes receptors applicable to the SWF according to Yukon CSR Protocol No. 6: *Application of Water Quality Standards*.

Table 4-2: Summary of Applicable Receptors

Receptor	Criteria for Applicability	Applicable to SWF	Name and Location of Receptor
Aquatic Life	1 km radius (groundwater travel time of less than or equal to 50 years) of the nearest surface water potentially containing aquatic life.	Applicable	Eagle River (within 1 km)
Drinking Water	1.5 km radius (groundwater travel time of less than or equal to 100 years) of the closest existing or probable future drinking water source.	Not Applicable	-
Irrigation	1.5 km radius (groundwater travel time of less than or equal to 100 years) of the closest surface waterbody used for an irrigation water source.	Not Applicable	-
Livestock	1.5 km radius (groundwater travel time of less than or equal to 100 years) of the closest surface waterbody used as a source for drinking water for livestock.	Not Applicable	-

4.3 Application of Applicable Soil Standards

Soil analytical results from the samples collected during the monitoring well drilling were compared to the numeric standards stipulated in the Yukon CSR. Yukon CSR generic numerical soil standards are listed in Yukon CSR Schedule 1, while matrix-based numerical soil standards are listed in Yukon CSR Schedule 2. Generic standards depend solely on land use and matrix standards are risk-based standards that depend on land use and a number of site-specific factors.

The Site is a SWF and is fenced off and inaccessible to the general public. Accordingly, the Yukon CSR Industrial Land Use (IL) generic soil and matrix soil standards apply to the Site.

For parameters regulated under Schedule 2 (matrix numerical soil standards) of the Yukon CSR, the most stringent applicable IL standard was selected to assess the soil quality.

4.4 Groundwater Quality Results

The analytical results for the groundwater samples collected from monitoring wells 15MW01 and 15MW07 are summarized in Table 2. Copies of laboratory reports and Chain of Custody documentation are included in Appendix F. Tables 4-3 and 4-4 summarize some key water quality parameters and the exceedances of the Yukon CSR-AW standards, respectively. The key water quality parameters are discussed in more detail in the following sections.

Table 4-3: Summary of Key Groundwater Quality Parameters

Parameter	Units	CSR - AW [1]	15MW01	15MW07
			10-Oct-2015	10-Oct-2015
Sulphate (SO_4)	µg/L	1,000,000	2900	7400
Total Dissolved Solids (TDS)	µg/L	-	52,000	64,000
Ammonia	µg/L	18,400-18,500 [2]	20	<10
Dissolved Organic Carbon (DOC)	µg/L	-	1400	15,800

Table 4-4: Summary of Exceedances of Yukon CSR-AW Standards from Groundwater Samples

Parameter	Units	Yukon CSR - AW	15MW07
Toluene	µg/L	390	**2380**
EPH_{10-19}	µg/L	5000	**118,000**
LEPH	µg/L	500	**117,000**
Naphthalene	µg/L	10	**589**
Phenanthrene	µg/L	3	**8.26**
Pyrene	µg/L	0.2	**0.33**

The groundwater encountered at 15MW01 and 15MW07 can be characterized as calcium-carbonate type waters. A trilinear Piper plot showing relative percentages of major ions of groundwater and surface water samples are presented in Figure 4.

A discussion of key groundwater parameters that potentially indicate impact to groundwater from the waste disposal facility and exceedances of relevant water quality standards are presented below.

4.4.1 Dissolved Organic Carbon

Dissolved Organic Carbon (DOC) concentrations can indicate organic matter sourced from a landfill impacting on groundwater. If a monitoring well is impacted by landfill leachate, DOC concentrations would be expected to show an increase to concentrations potentially in the hundreds or thousands of mg/L. DOC concentrations were an order of magnitude larger at 15MW07 than 15MW01 with reported concentrations at 15,800 µg/L (15.8 mg/L), indicating potential impact from poor waste storage on site.

4.4.2 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 NO_3, NH_3, Na, K, Mg, Ca, SO_4, Cl, HCO_3) contributing to an increase in TDS concentration. TDS concentrations were relatively low and consistent between the two monitoring wells, with slightly higher concentrations reported at 15MW07 (64,000 µg/L), which does not suggest any impacts from landfilling activities.

4.4.3 Sulphate

Sulphate concentrations are typically elevated in landfill leachate and can range from <0.5 mg/L to 1,850 mg/L (Fetter, 1993). Sulphate concentrations were slightly higher at 15MW07 (7,400 µg/L) than at 15MW01 (2,900 µg/L) but are considerably lower than the Yukon CSR-AW guideline. Concentrations are believed representative of background conditions.

4.4.4 Ammonia

Ammonia is a typical constituent of landfill leachate and an indicator of contamination sourced from a landfill. Ammonia was reported at detectable concentrations at 15MW01 (20 µg/L) but below the detection limit (10 µg/L) at 15MW07, which does not suggest any impacts from landfilling activities.

4.4.5 Organics

There were no exceedances of the Yukon CSR-AW standards for the parameters analyzed at 15MW01. All hydrocarbon parameters analyzed were below the laboratory detection limit except for a detection of pyrene at 0.02 µg/L. However, the observed concentration was at the detection limit and ten times below the CSR-AW standard.

Toluene, extractable petroleum hydrocarbons (EPH), light extractable petroleum hydrocarbons (LEPH), naphthalene, phenanthrene, and pyrene all exceeded the Yukon CSR-AW standards at 15MW07. This area has been impacted by soil contamination (see below) possibly sourced from the fuel drum storage adjacent to the well location.

No volatile organic compounds (VOCs) were detected at 15MW01 or 15MW07 during the October 2015 sampling event.

4.5 Surface Water Quality Results

The laboratory analytical results are summarized in Table 3 and the laboratory reports are provided in Appendix F. Table 4-5 summarizes the exceedances of the Yukon CSR-AW standards from surface water samples collected near the Site on October 9 and 10, 2015.

Surface water samples collected are characterized as calcium-magnesium-sulphate dominated waters. The relative major ion composition of the surface water samples is significantly different from the groundwater samples collected at the Site (see Figure 4). This suggests that the shallow groundwater at the Site is not the source of the water daylighting in the unnamed streams that the surface water samples SW1 through SW4 were collected from.

The concentration of various metals listed in Table 4-5 exceeded the Yukon CSR-AW standards at all sampling locations. The pH of all surface water was low ranging from 3.79 to 4.16. As described in Section 5.3.1, these observations are consistent with soil pH concentrations within the region which can be as low as 4.0. The low pH values, the exceedance for sulphate (in SW2) and exceedances for various metals in all samples suggest that the surface water quality at the sample locations to various extents is influenced by weathering of rock containing pyrite or other sulphide minerals.

Table 4-5: Summary of Exceedances of the Yukon CSR-AW Standards from Surface Water Samples

Parameter	Units	CSR - AW	SW1	SW2	SW3	SW4
			9-Oct-2015	9-Oct-2015	9-Oct-2015	10-Oct-2015
pH	pH Units	-	4.03	3.79	4.16	3.91
Sulphate (SO_4)	µg/L	100,000	44,800	**308,000**	44,800	39,100
Cadmium	µg/L	0.03-0.06 [1]	**0.16**	**1.50**	**0.20**	**0.76**
Chromium	µg/L	1 [2]	**1.4**	**1.7**	0.7	1.0
Cobalt	µg/L	0.9	**16.5**	**92.9**	**14.2**	**17.3**
Copper	µg/L	2-9 [1]	**2.2**	**2.2**	6.8	1.9
Nickel	µg/L	25-150 [1]	**42.4**	**277**	**36.1**	48.2
Zinc	µg/L	7.5-165 [1]	**134**	**781**	**126**	**160**
Pyrene	µg/L	0.02	<0.02	<0.02	<0.02	**0.06**

Note:

[1] Standard varies with hardness. Values shown based on hardness range of 33.8 mg/L to 270 mg/L

[2] Standard is for Chromium (VI)

Pyrene was detected at SW4 at concentrations within the same order of magnitude as the laboratory detection limit. Additional sampling is recommended to confirm this result. There is a potential for the occurrence of natural hydrocarbons in the Eagle Plains area. The area has been explored for oil and gas resources for decades and there are several natural surface seepages of hydrocarbons that were identified in the Eagle Plains basin (Hannigan 2014).

No other hydrocarbons were detected at any surface water sampling location and it is therefore very unlikely that the detection of pyrene in sample SW4 is related to the Eagle Plains SWF.

Ammonia was detected at all surface water sampling locations at concentrations within the same order of magnitude as the detection limit. Nitrate concentrations were highest at SW1 (129 µg/L), however these concentrations are much lower than the Yukon CSR-AW standard (40,000 µg/L) and likely representative of natural background.

4.6 Soil Chemistry

The laboratory analytical results or the soil samples collected during the monitoring well drilling are summarized in Table 4 and the laboratory reports are provided in Appendix F. Table 4-6 summarizes the exceedances of the Yukon CSR-IL standards from soil samples collected near the Site on October 9 and 10, 2015.

Table 4-6: Summary of Exceedances of Yukon CSR-IL Standards from Soil Samples

Parameter	Units	Yukon CSR - IL	15MW04	15MW07
			1.1-1.2 m	1.1-1.2 m
LEPH	µg/g	2,000	**2,830**	**2,830**
VPH C_{6-10}	µg/g	200	**972**	**411**

LEPH and HEPH were detected at all sampling locations with the exception of 15MW06 from 0.3-0.4 m. However, concentrations were three orders of magnitude higher at 15MW04 and 15MW07 at a depth of 1.1-1.2 m and exceeded the CSR-IL standards.

Several PAHs were detected in all samples collected except 15MW06 from 0.3-0.4 m. PAH concentrations were below applicable CSR-IL standards.

BTEX compounds were also detected at concentrations below the CSR-IL standards in samples from 15MW04 and 15MW07. No other VOCs were detected in any of the soil samples.

5.0 CONCEPTUAL HYDROGEOLOGICAL MODEL

5.1 Setting

The Site is located at an elevation of approximately 750 m above mean sea level and is situation on a local topographic high, Corbett Hill (Figure 1). The Site is relatively flat but slopes gently to the northeast from 15MW01 toward 15MW03. The Site is located near a natural surface water flow divide. Surface water flow from the Site could be either to the northeast or southwest.

5.2 Climate

The nearest climate station is located approximately 4.5 km northeast from the SWF (Climate ID. 2100468). Figure 5-1 displays the average monthly temperature and precipitation data from 1976 to 2006 for this station.

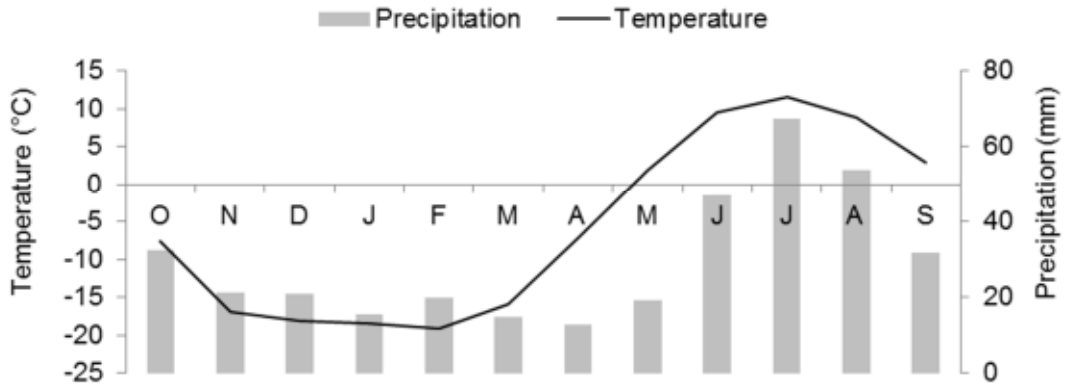

Figure 5-1: Average Monthly Temperature and Precipitation Data (Year 1967–Year 2006)

As indicated in Figure 5-1, below 0°C temperatures are observed from late September to early May; whereas, above 0°C temperatures occur from late May to early September. Most groundwater recharge is expected to occur during late summer and fall months (June to September) when the seasonal frost has thawed from the active layer and precipitation can infiltrate into the shallow soils.

5.2.1 Permafrost

The site is located within the Eagle Plains ecoregion which forms part of the Taiga Cordillera ecozone. This ecoregion is situated within the continuous permafrost zone. The active layer with seasonal freeze/thaw cycles typically varies from 20 to 90 cm in undisturbed areas (Yukon Ecoregions Working Group, 2004).

To assess permafrost conditions in the cleared area at the Site, five ground temperature cables were installed at the Site as described in Section 3.3. Ground temperature readings were collected and the resulting ground temperature profiles are shown below (Figure 5-2).

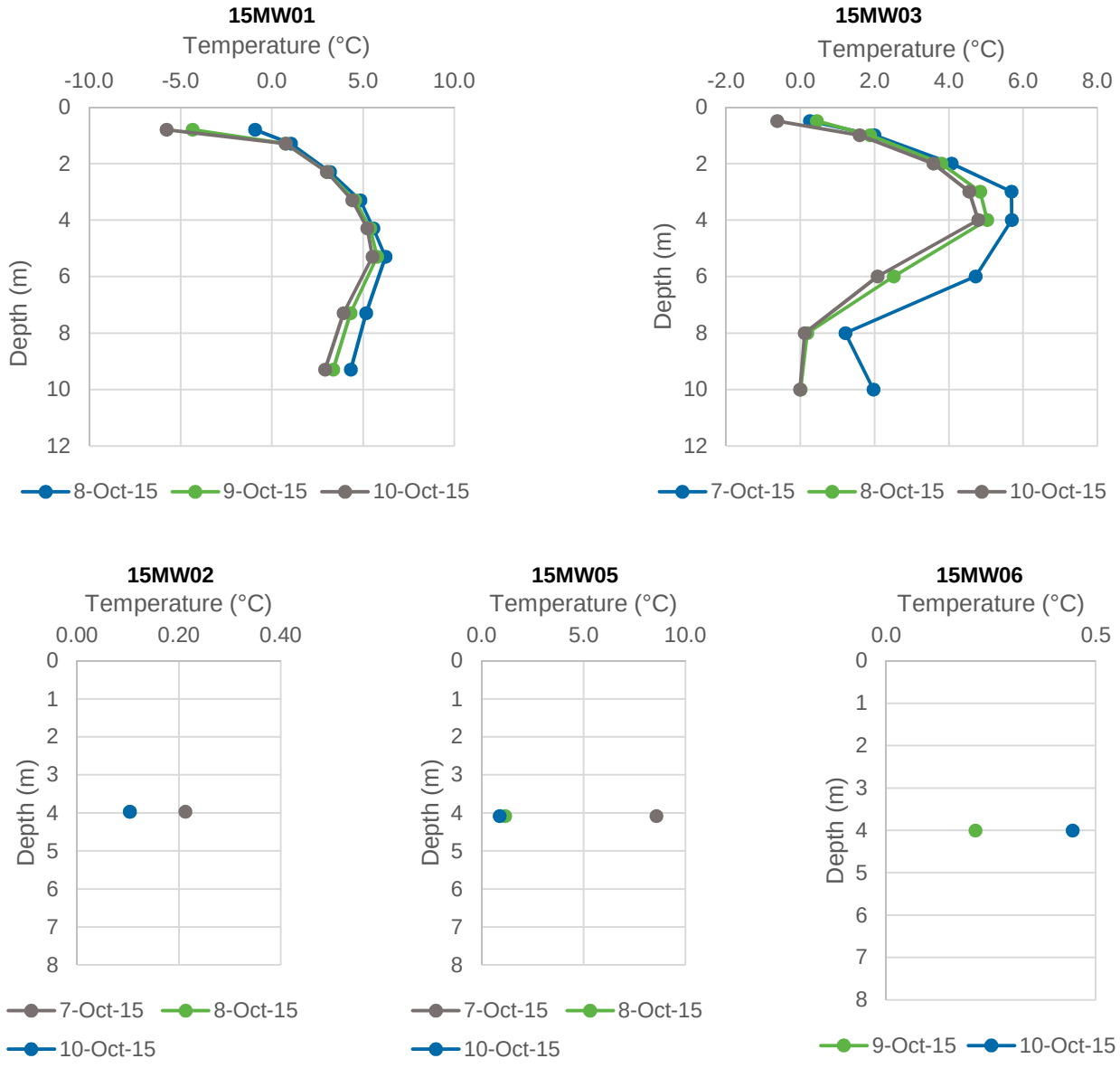

Figure 5-2: Ground Temperature Profiles at Various Monitoring Wells

The depth of the active layer appears to be greater than previously anticipated. However, using a sonic drill to drill through bedrock creates heat due to vibration and friction. It may therefore take several weeks for the ground temperature cables to fully equilibrate with the ambient soil temperatures. Tetra Tech EBA recommends additional monitoring to confirm the depth of the active layer.

The single bead thermistor cables installed at about 4 m below grade in monitoring wells 15MW02, 15MW05, and 15MW06 show ground temperatures to be much closer to freezing. The single ground temperature beads are much smaller in diameter and occupy less of the 1" PVC pipe they are installed into and are more likely to be affected by potential disturbance of the temperature profile on the well by air convection. If future readings suggest that air convection may be an issue, the PVC pipes can be filled with silicone oil which can prevent disturbance of the temperature profile in the well.

5.2.2 Surface Waterbodies

There are four small unnamed creeks located approximately 750 m north and northeast of the Site. These creeks flow into the Eagle River to the east and north of the Site.

5.3 Geology and Hydrogeology

5.3.1 Soils

Near surface permafrost is extensive in the Eagle Plains ecoregion (Yukon Ecoregions Working Group, 2004). Soils under open stands of white and black spruce are classified as Dystric Brunisols (Yukon Ecoregions Working Group, 2004). When associated with sandstone bedrock of the Eagle Plains Group, these soils may have a pH as low as 4 and contain large amounts of iron oxides (Yukon Ecoregions Working Group, 2004).

Soils were encountered at all monitoring wells except 15MW01. Soils generally consisted of a shallow layer of organics overlaying sand and gravel. Organics containing household garbage were observed at 15MW04 and 15MW07 and extended to a depth of 0.3 m bg. At 15MW03 and 15MW06, the sand and gravel directly overlaid bedrock (sandstone) and extended to a depth ranging from 0.5 to 0.7 m bg. At 15MW02, 15MW04, 15MW05 and 15MW07, the sand and gravel unit extended to a depth of 1.2 m and was underlain by a fine grained layer of silt and clay with variable thickness, ranging from 0.3 m at 15MW05 to 0.4 m at 15MW04. Bedrock was encountered below the silt and clay unit at these locations.

5.3.2 Bedrock Geology

The bedrock geology of the area is of Permian to Lower Carboniferous ages formed between 280 and 380 million years ago. (Yukon Geological Survey, 2015). The bedrock geology within 1 km of the Site is composed of three geological formations; the Ford Lake Shale, the Tuttle and Imperial Formations. The Ford Lake Shale Formation is of Upper Devonian to Permian age and consists of dark grey to black, silty pyritic shale and siltstone with sandstone, conglomerate and silty limestone (Yukon Geological Survey, 2015). The Tuttle formation consists of conglomerate and conglomeratic sandstone with siltstone, shale, and minor coal (Yukon Geological Survey, 2015). The Imperial Formation of Upper Devonian age consists of dark grey shale and siltstone overlain by dark grey fine grained lithic sandstone and siltstone (Yukon Geological Survey, 2015).

Rock types encountered during drilling included fine grained sandstone and organic rich shale with oxidation zones within both rock types. Cross section A-A', shown on Figure 3, illustrates the interpreted conceptual geological and hydrogeological model for the Site.

5.4 Groundwater Flow Regime

A conceptual hydrogeological model developed by Golder (2012) suggests regional groundwater flow within the fractured bedrock, with a seasonal discontinuous flow system developing at the overburden bedrock interface. As the Site is located within a zone of continuous permafrost, the majority of groundwater flow would occur within the bedrock fracture network below the permafrost. Some seasonal flow may also occur with the active zone located at or near ground surface. The principal aquifers identified are summarized in Table 5-1.

Table 5-1: Principal Aquifer

Aquifer Name	Location	Aquifer Type	Comment
Shallow supra-permafrost Aquifer (SA)	▪ Mapped as underlying and surrounding the Site	▪ Intergranular, porous media and shallow fractured bedrock	▪ Principal aquifer of interest to this assessment ▪ Discontinuous flow within active layer in both sand and gravel and fracture bedrock
Subpermafrost Aquifer (SPA)	▪ Mapped as underlying and surrounding the site	▪ Fractured bedrock	▪ Subpermafrost aquifer, likely >100 m deep ▪ Confined

5.4.1 Local Groundwater Flow

Local groundwater flow in the shallow supra-permafrost aquifer is likely primarily controlled by the thickness of the active layer with the top of the permafrost forming the base of the shallow aquifer. As the thickness of the active layer changes both spatially and temporally (seasonally) the shallow groundwater flow regime is complex and difficult to assess with respect to direction of flow, hydraulic gradient, and average linear flow velocity.

As the site is located up-gradient of the Eagle River on a topographical high, there is potential for local groundwater to flow towards tributaries of the Eagle River. However, based on the significant differences in groundwater and surface water chemistry, shallow groundwater originating at the Site does not seem to be the source of water in the Eagle River tributaries that were sampled as part of this assessment (surface water samples SW1 through SW4).

5.4.2 Groundwater Elevations, Flow Direction, Hydraulic Gradient

Groundwater was encountered in three wells on Site, 15MW01, 15MW02 and 15MW07. 15MW01 was completed in bedrock (shale and sandstone) and 15MW02 was completed in bedrock (shale and sandstone) and overburden (silt, sand and gravel). 15MW07 was completed above a confining silt lens with some shallow perched groundwater.

The observed depth to shallow groundwater in 15MW01 was about 3.8 m below grade. The depth to groundwater in 15MW02 of about 3.7 m below grade may not be representative due to the water level not reaching static conditions upon well completion and development due to slow recovery. The depth to groundwater recorded in 15MW07 was much shallower at about 0.8 m below grade; however, the water observed in this well was perched on top of a silt layer encountered at this location.

The groundwater flow direction cannot be determined based on the few locations were groundwater was encountered. Furthermore, as discussed above, the thickness of the active layer, which is variable in space and time, likely controls the shallow groundwater flow resulting in complex local flow cells and no uniform direction of groundwater flow. Given the fact that the Site is located within a cleared area that is likely characterized by a much thicker active layer than the surrounding undisturbed areas, off-site migration of shallow groundwater from the Site is likely very limited. The majority of the shallow groundwater is likely mostly stagnant within the ‘thaw bulb’ created in the cleared area.

5.5 Hydraulic Response Testing Results

Slug test results from 15MW01 were interpreted using the Bouwer and Rice (1976) analysis method implemented in AquiferTest™ Pro (ver. 2014.1). The estimated mean hydraulic conductivity in the shale unit encountered at 15MW01 is about 7×10^{-7} m/s which is a typical value for fractured bedrock.

The slug test data analysis is attached in Appendix G.

6.0 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:

- Leakage and spillage of hydrocarbons from onsite special waste storage areas;
- Leachate from landfilling activities within burn trench;
- Petroleum hydrocarbons and other organic compounds from stockpiled vehicles and refrigerators;
- Hydrocarbons from storage drums that were stockpiled and/or crushed and buried;
- Salt from salt storage on Site;
- There were no off-site sources of pollution identified 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 liquids/leachates from surface spills at the Site through the underlying overburden and into the shallow bedrock;
- Transport of contaminants within the shallow supra-permafrost aquifer; however, as described above, the risk of off-site migration of contaminated groundwater is probably relatively low due to the discontinuous flow system occurring within the shallow active layer;
- The risk of contamination entering the deep sub-permafrost aquifer is small given the extent of the continuous permafrost present in the Eagle Plains area with a reported thickness of up to more than 200 m (Yukon Ecoregions Working Group 2004).

7.0 SUMMARY AND CONCLUSIONS

- Six monitoring wells 15MW01, 15MW02, 15MW03, 15MW05, 15MW06 and 15MW07 were installed on October 7 and 8, 2015 to establish a groundwater monitoring network at the Site. The lithology encountered was similar at all locations. Each borehole profile generally consisted of overburden (sand, gravel and fine grained silt) overlying oxidized sandstone and organic rich shale.
- Each borehole was completed with a groundwater monitoring well and a ground temperature cable with the exception of 15MW07. Two 10 m ground temperature cables with eight beads were installed at 15MW01 and 15MW03 and three 4 m cables with one single bead were installed at 15MW02, 15MW05 and 15MW06.
- Ground temperature cables had not stabilized by October 10, 2015, and further readings are required to establish the extent of the active layer at the Site.
- Eight soil samples were collected and analyzed for hydrocarbons and metals. Soil samples collected from 15MW04 and 15MW07 from depths of 1.1 to 1.2 m exceeded the Yukon CSR-IL standards for LEPH and VPH C6-10. There were no other exceedances of the Yukon CSR-IL standards in any of the soil samples collected.
- Groundwater was encountered at 15MW01, 15MW02 and 15MW07 on October 10, 2015. The remaining wells were dry.
- Groundwater samples were collected from 15W01 and 15MW07. Only a partial sample could be collected from 15MW07 due to slow recharge rates. An insufficient amount of water was present in 15MW02 to collect a sample. There were no exceedances of the Yukon CSR-AW standards for the parameters analyzed at 15MW01. Toluene, extractable petroleum hydrocarbons (EPH), light extractable petroleum hydrocarbons (LEPH), naphthalene, phenanthrene, and pyrene all exceeded the Yukon CSR-AW standards at 15MW07. These results agree with the observed soil contamination at this location. The soil and groundwater results suggest that a fuel spill has occurred in the vicinity of wells 15MW04 and 15MW07, possibly originating from the adjacent fuel drum storage area. However, further assessment is required to delineate the extent of the contaminated soil and groundwater, and to identify the source of the hydrocarbons.
- Four surface water samples (SW1, SW2, SW3 and SW4) were collected from unnamed creeks to the northeast and west of the Site. Surface water samples collected had low pH values and high concentrations of metals. The concentration of the following parameters exceeded the Yukon CSR-AW standards:
  - Sulphate at SW2
  - Cadmium at SW1, SW2, SW3 and SW4
  - Chromium at SW1 and SW2
  - Cobalt at SW1, SW2, SW3 and SW4
  - Copper at SW1 and SW2
  - Nickel at SW1, SW2 and SW3
  - Zinc at SW1, SW2, SW3 and SW4
  - Pyrene at SW4

- The exceedance for sulphate (in SW2), the low pH and exceedances for various metals in all samples suggest that the surface water quality at the Site is possibly influenced by weathering of bedrock containing pyrite and other sulphide minerals.
- The relative major ion composition of the groundwater and surface water samples was significantly different suggesting that the shallow groundwater originating at the Site is not the source of water daylighting in nearby creeks. The exceedances of CSR-AW standards in the surface water samples are likely naturally occurring and representative of background conditions.
- Shallow groundwater flow occurs within the active layer above continuous permafrost. The shallow groundwater flow regime is complex due to the spatial and temporal variability of the active zone thickness which likely controls shallow groundwater flow. Assuming that the active layer is considerably thicker within the cleared area of the SWF compared to the surrounding undisturbed land, most shallow groundwater would likely be confined to the Site with little potential for offsite migration. However, additional readings from the ground temperature cables and seasonal monitoring of the shallow groundwater are required to better determine the extent of the active layer and presence of shallow groundwater at the Site.

8.0 RECOMMENDATIONS

The following recommendations are made based on the findings of the 2015 hydrogeological assessment:

- A protective casing on 15MW07 should be installed during the next sampling event
- Additional ground temperature and groundwater monitoring is required to better determine the extent of the active zone and shallow groundwater at the Site.
- If the ground temperature readings suggest issues with air convection that disturb the temperature profile in the well, the ground temperature cables should be removed, the PVC pipe filled with silicone oil, and the cables re-deployed. This will minimize potential disturbance of the temperature profile in the monitoring well and is an accepted method to complete observation wells with ground temperature cables.
- Ongoing groundwater, surface water, and ground temperature monitoring should be conducted in accordance with the requirements stipulated in Permit 80-011; however, based on the results of this hydrogeological assessment we recommend a revised monitoring plan for the Eagle Plains SWF that could be implemented through a Permit amendment. The recommended monitoring plan is further outlined below.

8.1 Recommended Monitoring Plan

Groundwater Monitoring

- Pressure transducer with dataloggers should be installed in monitoring wells 15MW01 and 15MW02 to monitor seasonal changes in groundwater levels for the period of two summers (assuming that the wells freeze completely during the winter). Future sampling events should be conducted once per year at the time of maximum groundwater elevations.
- Groundwater levels should be measured in all monitoring wells at the Site.
- Groundwater samples should be collected from all monitoring wells containing sufficient water and should be analyzed for the suite of parameters stipulated in Permit 80-011.

Surface Water Monitoring

- Surface water samples should be collected from sample locations SW1 through SW4 during the next monitoring event in spring/summer 2016 to confirm the results presented in this report. If the samples collected during the next monitoring event are similar to the previous results and confirm the interpretation that shallow groundwater originating from the Site is unlikely a source for the nearby surface water bodies based on significantly different water chemistry, surface water should be excluded from regular future monitoring events.
- Surface water samples should only be collected during future sampling events if ongoing groundwater monitoring at the Site indicates the presence of contaminated groundwater potentially migrating off site.

Ground Temperature Monitoring

- Ground temperatures should be monitored on a weekly basis from May to October 2016. Ideally the ground temperature monitoring should be conducted by YG staff based at Eagle Plains and would require about half an hour per week not including travel to and from the Site. If this is not feasible, the possibility of connecting dataloggers to the ground temperature cables in 15MW01 and 15MW03 should be explored. However, dataloggers for ground temperature cables are costly and manual readings would therefore be preferred.

- The weekly ground temperature readings should be used to determine the vertical extent of the active layer within the cleared area and the time of maximum thickness of the active zone. Future groundwater monitoring should be conducted when the active layer reaches its maximum seasonal thickness which is assumed to occur in the fall and should roughly coincide with the time of the highest groundwater levels.

9.0 CLOSURE

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

Respectfully submitted,
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TABLES

Table 1: Summary of Monitoring Well Installation Details

Well ID	Easting	Northing	Ground Elevation	Top of PVC Elevation	Depth to Bottom	Elevation of Bottom of Well	Stick Up	Casing Diameter	Screened Interval	Filter Pack Interval	Annular Bentonite Seal	Depth to Water	Groundwater Elevation
			(m)	(m)	(m btoc)	(m)	(m)	(mm)	(m bg)	(m bg)	(m bg)	(m btoc)	(m)
15MW01	422126	7357847	100.78	101.59	4.12	97.47	0.81	25	1.1 - 4.1	0.7 - 4.1	0.0 - 0.7	4.57	97.02
15MW02	421971	7357891	97.39	98.39	3.85	94.54	1.00	25	0.9 - 3.9	0.7 - 4.0	0.0 - 0.7	4.72	93.67
15MW03	421941	7357949	96.11	97.01	3.98	93.03	0.90	25	0.9 - 4.0	0.7 - 4.0	0.0 - 0.7	dry	-
15MW05	422286	7357815	99.90	100.71	4.14	96.58	0.81	25	1.0 - 4.1	0.7 - 4.1	0.0 - 0.7	dry	-
15MW06	422006	7357913	98.28	99.11	4.00	95.11	0.83	25	1.0 - 4.0	0.7 - 4.0	0.0 - 0.7	dry	-
15MW07	422047	7357933	99.26	100.20	1.21	98.99	0.94	25	0.8 - 1.2	0.6 - 1.35	0.0 - 0.6	1.75	98.45

Note:
All elevations are relative to arbitrary benchmark.
- 'm bg' denotes meters below ground
- 'm btoc' denotes meters below top of pvc casing

Table 2: Groundwater Analytical Results

Parameter	Units	RDL	CSR - AW [1]	15MW01	15MW07
				10-Oct-2015	10-Oct-2015
Physical Parameters					
pH	pH Units	0.01	-	7.05	6.62
Chloride (Cl)	µg/L	50	-	9440	5330
Sulphate (SO_4)	µg/L	500	1,000,000	2900	7400
Total Dissolved Solids (TDS)	µg/L	5000	-	52,000	64,000
Hardness as $CaCO_3$	µg/L	100	-	29,100	51,300
Orthophosphate (as P)	µg/L	1	-	8	<1
Alkalinity (Bicarbonate)	µg/L		-	25000	38000
Alkalinity (Carbonate)	µg/L		-	<1000	<1000
Alkalinity (total as CaCO3)	µg/L		-	25000	38000
Nutrients					
Ammonia	µg/L	10	18,400-18,500 [2]	20	<10
Total Kjeldahl Nitrogen (TKN)	µg/L	100	-	400	1800
Nitrate (as N)	µg/L	5	400,000	94	140
Nitrite (as N)	µg/L	5	600-1000 [3]	<5	<5
Carbon					
Dissolved Organic Carbon (DOC)	µg/L	500	-	1400	15,800
Demand Parameters					
Chemical Oxygen Demand (COD)	µg/L	10000	-	13,000	158,000
Dissolved Metals					
Aluminum	µg/L	2	-	3	63
Antimony	µg/L	0.2	200	<0.2	<0.2
Arsenic	µg/L	0.1	50	0.3	0.3
Barium	µg/L	0.2	10,000	22.6	90.9
Beryllium	µg/L	0.01	53	<0.01	<0.01
Boron	µg/L	2	50,000	7	19
Cadmium	µg/L	0.01	0.1-0.3 [4]	0.02	0.3
Calcium	µg/L	50	-	9400	15,700
Calcium	µg/L	50	-	9400	15,700
Chromium	µg/L	0.5	10 [5]	<0.5	<0.5
Cobalt	µg/L	0.05	9	0.23	1.12
Copper	µg/L	0.2	20-30 [4]	0.3	2.3
Iron	µg/L	10	-	<10	46
Lead	µg/L	0.05	40-50 [4]	<0.05	<0.05
Lithium	µg/L	0.5	-	1.0	<0.5
Magnesium	µg/L	50	-	1360	2930
Magnesium	µg/L	50	-	1360	2930
Manganese	µg/L	1	-	48	150
Mercury	µg/L	0.01	1	<0.01	<0.01
Molybdenum	µg/L	0.05	10,000	0.47	0.43
Nickel	µg/L	0.2	250 [4]	0.6	3.9
Potassium	µg/L	50	-	433	545
Selenium	µg/L	0.5	10	<0.5	<0.5
Silver	µg/L	0.02	0.5 [4]	<0.02	<0.02
Sodium	µg/L	50	-	2400	2020
Sodium	µg/L	50	-	2400	2020
Thallium	µg/L	0.01	3	<0.01	0.01
Titanium	µg/L	0.5	1000	0.8	3.9
Uranium	µg/L	0.01	3000	0.05	0.04
Vanadium	µg/L	0.5	-	<0.5	<0.5
Zinc	µg/L	2	75 [4]	<2	3
BTEXS & MTBE					
Benzene	µg/L	0.5	4000	<0.5	179
Toluene	µg/L	0.5	390	<0.5	**2380**
Ethylbenzene	µg/L	0.5	2000	<0.5	278
Xylene (m)	µg/L	0.5	-	<0.5	1560
Xylene (o)	µg/L	0.5	-	<0.5	833
Xylenes Total	µg/L	1	-	<1	2390
Styrene	µg/L	0.5	720	<0.5	<0.5
MTBE	µg/L	1	-	<1	<1
Hydrocarbons					
EPH_{10-19}	µg/L	100	5000	<100	**118,000**
EPH_{19-32}	µg/L	100	-	<100	4000
LEPH	µg/L	100	500	<100	**117,000**
HEPH	µg/L	100	-	<100	3960

Table 2: Groundwater Analytical Results

Parameter	Units	RDL	CSR - AW [1]	15MW01	15MW07
				10-Oct-2015	10-Oct-2015
Polycyclic Aromatic Hydrocarbons (PAHs)					
Acenaphthene	µg/L	0.05	60	<0.05	<5
Acenaphthylene	µg/L	0.05	-	<0.05	<5
Acridine	µg/L	0.05	0.5	<0.05	<0.05
Anthracene	µg/L	0.05	1	<0.05	<0.05
Benz(a)anthracene	µg/L	0.05	1	<0.05	<0.05
Benzo(a) pyrene	µg/L	0.01	0.1	<0.01	<0.01
Benzo(b)fluoranthene	µg/L	0.05	-	<0.05	0.13
Benzo(b+j)fluoranthene	µg/L	0.1	-	<0.1	0.1
Benzo(g,h,i)perylene	µg/L	0.05	-	<0.05	0.15
Benzo(k)fluoranthene	µg/L	0.05	-	<0.05	<0.05
Chrysene	µg/L	0.05	-	<0.05	0.09
Dibenz(a,h)anthracene	µg/L	0.05	-	<0.05	<0.05
Fluoranthene	µg/L	0.05	2	<0.05	0.2
Fluorene	µg/L	0.05	120	<0.05	13
Indeno(1,2,3-c,d)pyrene	µg/L	0.05	-	<0.05	<0.05
Naphthalene	µg/L	0.05	10	<0.05	**589**
Phenanthrene	µg/L	0.05	3	<0.05	**8.26**
Pyrene	µg/L	0.02	0.2	0.02	**0.33**
Quinoline	µg/L	0.1	34	<0.1	<10
Volatile Organic Compounds (VOCs)					
1,1,1,2-tetrachloroethane	µg/L	1	-	<1	<1
1,1,1-trichloroethane	µg/L	1	-	<1	<1
1,1,2,2-tetrachloroethane	µg/L	1	-	<1	<1
1,1,2-trichloroethane	µg/L	1	-	<1	<1
1,1-dichloroethane	µg/L	1	-	<1	<1
1,1-dichloroethene	µg/L	1	-	<1	<1
1,2,4-trichlorobenzene	µg/L	1	240	<1	<1
1,2-dibromoethane	µg/L	0.3	-	<0.3	<0.3
1,2-dichlorobenzene	µg/L	0.5	-	<0.5	<0.5
1,2-dichloroethane	µg/L	1	1000	<1	<1
1,2-dichloropropane	µg/L	1	-	<1	<1
1,3-dichlorobenzene	µg/L	0.5	1500	<0.5	<0.5
1,4-dichlorobenzene	µg/L	0.5	260	<0.5	<0.5
4-Methyl-2-pentanone	µg/L	10	-	<10	<10
Acetone	µg/L	10	-	<10	<10
Bromodichloromethane	µg/L	1	-	<1	<1
Bromoform	µg/L	1	-	<1	<1
Bromomethane	µg/L	1	-	<1	<1
Carbon tetrachloride	µg/L	0.5	130	<0.5	<0.5
Chlorobenzene	µg/L	1	13	<1	<1
Chloroethane	µg/L	1	-	<1	<1
Chloroform	µg/L	1	20	<1	<1
Chloromethane	µg/L	1	-	<1	<1
cis-1,2-dichloroethene	µg/L	1	-	<1	<1
cis-1,3-dichloropropene	µg/L	1	-	<1	<1
Dibromochloromethane	µg/L	1	-	<1	<1
Dichloromethane	µg/L	1	980	<1	<1
Methyl Ethyl Ketone	µg/L	10	-	<10	<10
Tetrachloroethene	µg/L	1	1100	<1	<1
trans-1,2-dichloroethene	µg/L	1	-	<1	<1
trans-1,3-dichloropropene	µg/L	1	-	<1	<1
Trichloroethene	µg/L	1	200	<1	<1
Trichlorofluoromethane	µg/L	1	-	<1	<1
Trihalomethanes	µg/L	2	-	<2	<2
Vinyl chloride	µg/L	1	-	<1	<1
Laboratory Work Order Number				15V029854	15V029854
Laboratory Identification Number				7080691	7080699

Notes:

[1] Environment Act. Contaminated Sites Regulation (CSR) (2002). Schedule 3, Generic Numerical Water Standards for Aq
[2] Standard varies with pH. Values shown based on pH range of 6.62 to 7.05
[3] Standard varies with chloride. Values shown based on chloride range of 5.33 mg/L to 9.44 mg/L
[4] Standard varies with hardness. Values shown based on hardness range of 28.7 mg/L to 51.3 mg/L
[5] Standard is for Chromium VI
"-" No applicable standard or not analyzed
BOLD - Greater than CSR Standard
N/A - Not applicable

Table 3: Surface Water Analytical Results

Parameter	Units	RDL	CSR - AW [1]	SW1	SW2	SW3	SW4
				9-Oct-2015	9-Oct-2015	9-Oct-2015	10-Oct-2015
Physical Parameters							
pH	pH Units	0.01	-	4.03	3.79	4.16	3.91
Chloride (Cl)	µg/L	50	-	90	25,100	6360	46,200
Sulphate (SO_4)	µg/L	500	100,000	44,800	**308,000**	44,800	39,100
Total Dissolved Solids (TDS)	µg/L	5000	-	80,000	462,000	88,000	195,000
Hardness as $CaCO_3$	µg/L	100	-	33,800	270,000	41,100	79,100
Orthophosphate (as P)	µg/L	1	-	<1	7	<1	1
Alkalinity (Bicarbonate)	µg/L		-	<1000	<1000	<1000	<1000
Alkalinity (Carbonate)	µg/L		-	<1000	<1000	<1000	<1000
Alkalinity (total as CaCO3)	µg/L		-	<1000	<1000	<1000	<1000
Nutrients							
Ammonia	µg/L	10	1840 [2]	20	50	30	40
Total Kjeldahl Nitrogen (TKN)	µg/L	100	-	600	600	600	500
Nitrate (as N)	µg/L	5	40,000	129	20	28	9
Nitrite (as N)	µg/L	5	20-200 [3]	<5	<5	<5	<5
Carbon							
Dissolved Organic Carbon (DOC)	µg/L	500	-	9000	5700	5500	8500
Demand Parameters							
Biochemical Oxygen Demand (BOD)	µg/L	4000	-	<4000	<4000	<4000	<4000
Chemical Oxygen Demand (COD)	µg/L	10000	-	33,000	24,000	19,000	31,000
Total Metals							
Aluminum Total	ug/L	5	-	1780	10,100	899	1770
Antimony	µg/L	0.5	20	<0.5	<0.5	<0.5	<0.5
Arsenic	µg/L	0.1	5	0.5	0.6	0.2	0.3
Barium	µg/L	0.5	1000	56.1	39.6	114	238
Beryllium	µg/L	0.05	5.3	0.34	1.96	0.34	0.47
Boron	µg/L	5	5000	12	27	21	8
Cadmium	µg/L	0.01	0.03-0.06 [4]	**0.16**	**1.50**	**0.20**	**0.76**
Calcium	µg/L	50	-	5570	60,100	9760	22,700
Chromium	µg/L	0.5	1 [5]	**1.4**	**1.7**	0.7	1.0
Cobalt	µg/L	0.05	0.9	**16.5**	**92.9**	**14.2**	**17.3**
Copper	µg/L	0.5	2-9 [4]	**2.2**	6.8	1.9	3.1
Iron	µg/L	10	-	1160	1590	559	901
Lead	µg/L	0.05	4-11 [4]	0.38	0.35	0.14	0.27
Lithium	µg/L	0.5	-	7.1	30.3	9.4	11.3
Magnesium	µg/L	50	-	4830	29,000	4060	5450
Manganese	µg/L	1	-	145	1140	174	225
Mercury	µg/L	0.01	0.1	<0.01	<0.01	<0.01	<0.01
Molybdenum	µg/L	0.1	1000	<0.1	0.1	<0.1	<0.1
Nickel	µg/L	0.5	25-150 [4]	**42.4**	**277**	**36.1**	48.2
Potassium	µg/L	100	-	252	1170	287	191
Selenium	µg/L	0.5	1	<0.5	<0.5	<0.5	<0.5
Silver	µg/L	0.02	0.05, 1.5 [4]	<0.02	<0.02	<0.02	0.02
Sodium	µg/L	100	-	810	4010	1060	1190
Thallium	µg/L	0.02	0.3	<0.02	0.02	<0.02	<0.02
Titanium	µg/L	1	100	6	7	1	3
Uranium	µg/L	0.01	300	0.05	0.06	0.01	0.02
Vanadium	µg/L	1	-	2	2	<1	1
Zinc	µg/L	5	7.5-165 [4]	**134**	**781**	**126**	**160**
BTEXS & MTBE							
Benzene	µg/L	0.5	400	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	39	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	200	<0.5	<0.5	<0.5	<0.5
Xylene (m)	µg/L	0.5	-	<0.5	<0.5	<0.5	<0.5
Xylene (o)	µg/L	0.5	-	<0.5	<0.5	<0.5	<0.5
Xylenes Total	µg/L	1	-	<1	<1	<1	<1
Styrene	µg/L	0.5	72	<0.5	<0.5	<0.5	<0.5
MTBE	µg/L	1	-	<1	<1	<1	<1
Hydrocarbons							
EPH_{10-19}	µg/L	100	500	<100	<100	<100	<100
EPH_{19-32}	µg/L	100	-	<100	<100	<100	<100
LEPH	µg/L	100	50	*<100*	*<100*	*<100*	*<100*
HEPH	µg/L	100	-	<100	<100	<100	<100
Volatile Hydrocarbons (VH_{6-10})	µg/L	100	-	<100	<100	<100	<100
VPH C_{6-10}	µg/L	100	150	<100	<100	<100	<100

Table 3: Surface Water Analytical Results

Parameter	Units	RDL	CSR - AW [1]	SW1	SW2	SW3	SW4
				9-Oct-2015	9-Oct-2015	9-Oct-2015	10-Oct-2015
Polycyclic Aromatic Hydrocarbons (PAHs)							
Acenaphthene	µg/L	0.05	6	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/L	0.05	-	<0.05	<0.05	<0.05	<0.05
Acridine	µg/L	0.05	0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/L	0.05	0.1	<0.05	<0.05	<0.05	<0.05
Benz(a)anthracene	µg/L	0.05	0.1	<0.05	<0.05	<0.05	<0.05
Benzo(a) pyrene	µg/L	0.01	0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/L	0.05	-	<0.05	<0.05	<0.05	<0.05
Benzo(b+j)fluoranthene	µg/L	0.1	-	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.05	-	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/L	0.05	-	<0.05	<0.05	<0.05	<0.05
Chrysene	µg/L	0.05	-	<0.05	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/L	0.05	-	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L	0.05	0.2	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/L	0.05	12	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	µg/L	0.05	-	<0.05	<0.05	<0.05	<0.05
Naphthalene	µg/L	0.05	1	0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/L	0.05	0.3	<0.05	<0.05	<0.05	<0.05
Pyrene	µg/L	0.02	0.02	<0.02	<0.02	<0.02	**0.06**
Quinoline	µg/L	0.1	3.4	<0.1	<0.1	<0.1	<0.1
Laboratory Work Order Number				15V029854	15V029854	15V029854	15V029854
Laboratory Identification Number				7080701	7080702	7080703	7080704

Notes:

[1] Environment Act. Contaminated Sites Regulation (CSR) (2002). Schedule 3, Generic Numerical Water Standards for Freshwater Aquatic Life (AW). Standards have been decreased by a magnitude of 10.

[2] Standard varies with pH. Value shown based on pH range of 3.79 to 4.16

[3] Standard varies with chloride. Values shown based on chloride range of 0.09 mg/L to 46.2 mg/L

[4] Standard varies with hardness. Values shown based on hardness range of 33.8 mg/L to 270 mg/L

[5] Standard is for Chromium VI

"-" No applicable standard or not analyzed

BOLD - Greater than CSR Standard

Italic - Detection limit greater than CSR standard

Table 4: Soil Analytical Results

Parameter	Units	RDL	CSR - IL[1]	15MW01			15MW04		15MW06	15MW07	
				1.8-2.0 m	9.8-10 m	DUP 01	0.3-0.4 m	1.1-1.2 m	0.3-0.4 m	0.5-0.6 m	1.1-1.2 m
				7-Oct-2015	7-Oct-2015	7-Oct-2015	7-Oct-2015	7-Oct-2015	8-Oct-2015	8-Oct-2015	8-Oct-2015
Physical Parameters											
pH	pH Units	0.1	-	4.6	4.4	4.3	4.5	5.3	5.4	4.9	5.3
Metals											
Antimony	µg/g	0.1	40	0.8	0.5	0.5	0.3	0.4	0.3	0.4	0.2
Arsenic	µg/g	0.1	20 [2]	32.0	38.7	37.5	7.4	10.5	5.3	7.7	6.0
Barium	µg/g	0.5	2000	244	380	400	75.1	114	44.0	119	79.0
Beryllium	µg/g	0.1	8	0.6	1.1	1.1	0.3	0.4	0.1	0.3	0.2
Cadmium	µg/g	0.01	2 [2,3]	0.06	0.05	0.09	0.08	0.11	0.02	0.07	0.05
Chromium	µg/g	1	60 [2]	24	32	32	12	11	4	16	7
Cobalt	µg/g	0.1	300	1.6	6.8	6.8	1.5	2.8	0.7	3.1	1.5
Copper	µg/g	0.2	90-100 [2,3]	31.4	53.1	70.0	5.7	10.1	3.7	9.9	4.8
Lead	µg/g	0.1	150 [2,3]	16.2	17.6	18.4	6.7	6.9	3.2	6.9	5.4
Mercury	µg/g	0.01	150 [2]	0.12	0.05	0.05	<0.01	0.01	<0.01	0.02	<0.01
Molybdenum	µg/g	0.2	40	0.9	0.7	0.7	0.7	0.6	0.3	0.6	0.3
Nickel	µg/g	0.5	500	15.7	42.6	40.9	5.7	13.0	3.3	11.1	5.8
Selenium	µg/g	0.1	10	2.6	1.3	1.7	0.3	0.7	0.2	0.5	0.4
Silver	µg/g	0.5	40	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium	µg/g	0.1	-	0.2	0.2	0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	µg/g	0.2	300	0.6	0.8	0.8	0.3	0.2	<0.2	0.3	<0.2
Uranium	µg/g	0.2	-	1.0	1.2	1.3	0.4	0.5	0.2	0.5	0.3
Vanadium	µg/g	1	-	62	82	82	34	29	11	32	16
Zinc	µg/g	1	150 [2,3]	39	87	89	20	53	12	34	18
BTEXS & MTBE											
Benzene	µg/g	0.02	10 [2]	<0.02	<0.02	<0.02	0.37	1.02	<0.02	<0.02	0.02
Toluene	µg/g	0.05	25 [2]	<0.05	<0.05	<0.05	1.16	5.31	<0.05	0.07	6.47
Ethylbenzene	µg/g	0.05	20 [2]	<0.05	<0.05	<0.05	0.12	2.18	<0.05	<0.05	4.19
Xylene (m)	µg/g	0.05	-	<0.05	<0.05	<0.05	0.97	24.4	<0.05	0.08	24.5
Xylene (o)	µg/g	0.05	-	<0.05	<0.05	<0.05	1.18	9.53	<0.05	0.07	10.7
Xylenes Total	µg/g	0.2	50 [2]	<0.2	<0.2	<0.2	2.2	33.9	<0.2	<0.2	35.2
Styrene	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.37
MTBE	µg/g	0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hydrocarbons											
LEPH	µg/g	20	2000	23	62	63	29	**2830**	<20	28	**2830**
HEPH	µg/g	20	5000	78	111	111	65	178	<20	28	63
VPH C_{6-10}	µg/g	10	200	<10	<10	<10	54	**972**	<10	<10	**411**
Polycyclic Aromatic Hydrocarbons (PAHs)											
1-methylnaphthalene	µg/g	0.01	-	<0.01	0.05	0.06	0.04	12.5	<0.01	0.06	11.7
2-methylnaphthalene	µg/g	0.01	-	<0.01	0.04	0.05	0.05	17.2	<0.01	0.07	18.5
Acenaphthene	µg/g	0.01	-	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.1
Acenaphthylene	µg/g	0.01	-	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.1
Anthracene	µg/g	0.02	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benz(a)anthracene	µg/g	0.02	10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a) pyrene	ug/g	0.05	10 [2]	<0.05	0.06	0.08	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g	0.02	10	0.12	0.09	0.12	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(g,h,i)perylene	µg/g	0.05	-	0.23	0.7	0.89	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g	0.02	10	0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chrysene	µg/g	0.05	-	0.11	0.08	0.08	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.02	10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluoranthene	µg/g	0.05	-	0.07	0.08	0.09	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g	0.02	-	<0.02	<0.02	<0.02	<0.02	0.5	<0.02	<0.02	0.3
Indeno(1,2,3-c,d)pyrene	µg/g	0.02	10	0.04	0.04	0.06	<0.02	<0.02	<0.02	<0.02	<0.02
Naphthalene	µg/g	0.01	50	<0.01	<0.01	<0.01	0.01	7.3	<0.01	0.02	8.8
Phenanthrene	µg/g	0.02	50	0.06	0.13	0.15	<0.02	0.56	<0.02	<0.02	0.23
Pyrene	µg/g	0.02	100	0.09	0.15	0.16	<0.02	0.02	<0.02	<0.02	<0.02
Volatile Organic Compounds (VOCs)											
1,1,1,2-tetrachloroethane	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-trichloroethane	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-tetrachloroethane	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-trichloroethane	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-dichloroethane	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-dichloroethene	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2,4-trichlorobenzene	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-dibromoethane	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-dichlorobenzene	µg/g	0.05	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-dichloroethane	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-dichloropropane	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-dichlorobenzene	µg/g	0.05	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,4-dichlorobenzene	µg/g	0.05	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-Methyl-2-pentanone	µg/g	0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acetone	µg/g	0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon tetrachloride	µg/g	0.02	50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chlorobenzene	µg/g	0.05	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroethane	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloromethane	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-1,2-dichloroethene	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-1,3-dichloropropene	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloromethane	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	µg/g	0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	µg/g	0.05	5 [2]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,2-dichloroethene	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,3-dichloropropene	µg/g	0.05	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	µg/g	0.01	0.65 [2]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorofluoromethane	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	µg/g	0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Organics											
Total Tetrachlorodibenzodioxins	ng/kg	0.5	-	<0.5	<0.8	<1	3	<1	<0.9	<0.6	<1
Total Tetrachlorodibenzofurans	ng/kg	0.5	-	0.9	<0.6	<1	<1	0.8	1.3	0.9	<0.8
Total PCDDs and PCDFs (TEQ)	ng/kg		2500	0.319	0.433	0.514	1.46	1.03	1.97	1.53	0.201
Laboratory Work Order Number				15V029854	15V029854	15V029854	15V029854	15V029854	15V029854	15V029854	15V029854
Laboratory Identification Number				7079507	7079503	7079508	7079510	7079509	7079506	7079505	7079504

Notes:

[1] Environment Act. Contaminated Sites Regulation (CSR) (2002). Schedule 1 - Generic Numerical Soil Standards and Schedule 2 - Matrix Numerical Soil Standards for Industrial (IL) land use

[2] Schedule 2 Parameter. Pathways included:
Intake of contaminated soil
Toxicity to soil invertebrates and plants
Groundwater flow to surface water used by freshwater aquatic life

[3] Standard varies with pH. Values shown based on pH range 4.3 to 5.4

"-" No applicable standard or not analyzed

BOLD - Greater than CSR Standard

Table 5: Groundwater Quality Assurance/Quality Control Analytical Results

Parameter	Units	RDL	15MW01	Dup 01	RPD
			10-Oct-2015		
Physical Parameters					
pH	pH Units	0.01	7.05	7.03	0.1
Chloride (Cl)	µg/L	50	9440	9260	1
Sulphate (SO_4)	µg/L	500	2900	2900	0
Total Dissolved Solids (TDS)	µg/L	5000	52,000	42,000	11
Hardness as $CaCO_3$	µg/L	100	29,100	28,700	1
Orthophosphate (as P)	µg/L	1	8	7	7
Nutrients					
Ammonia	µg/L	10	20	20	-
Total Kjeldahl Nitrogen (TKN)	µg/L	100	400	400	-
Nitrate (as N)	µg/L	5	94	100	3
Nitrite (as N)	µg/L	5	<5	<5	-
Carbon					
Dissolved Organic Carbon (DOC)	µg/L	500	1400	900	-
Demand Parameters					
Chemical Oxygen Demand (COD)	µg/L	10000	13,000	12,000	-
Dissolved Metals					
Aluminum	µg/L	2	3	3	-
Antimony	µg/L	0.2	<0.2	<0.2	-
Arsenic	µg/L	0.1	0.3	0.3	-
Barium	µg/L	0.2	22.6	22.6	0
Beryllium	µg/L	0.01	<0.01	<0.01	-
Boron	µg/L	2	7	7	-
Cadmium	µg/L	0.01	0.02	0.01	-
Calcium	µg/L	50	9400	9310	0.5
Calcium	µg/L	50	9400	9310	0.5
Chromium	µg/L	0.5	<0.5	<0.5	-
Cobalt	µg/L	0.05	0.23	0.24	-
Copper	µg/L	0.2	0.3	0.4	-
Iron	µg/L	10	<10	<10	-
Lead	µg/L	0.05	<0.05	<0.05	-
Lithium	µg/L	0.5	1.0	1.2	-
Magnesium	µg/L	50	1360	1320	1
Magnesium	µg/L	50	1360	1320	1
Manganese	µg/L	1	48	46	2
Mercury	µg/L	0.01	<0.01	<0.01	-
Molybdenum	µg/L	0.05	0.47	0.41	7
Nickel	µg/L	0.2	0.6	0.6	-
Potassium	µg/L	50	433	424	1
Selenium	µg/L	0.5	<0.5	<0.5	-
Silver	µg/L	0.02	<0.02	<0.02	-
Sodium	µg/L	50	2400	2470	1
Sodium	µg/L	50	2400	2470	1
Thallium	µg/L	0.01	<0.01	<0.01	-
Titanium	µg/L	0.5	0.8	0.7	-
Uranium	µg/L	0.01	0.05	0.05	0
Vanadium	µg/L	0.5	<0.5	<0.5	-
Zinc	µg/L	2	<2	<2	-
BTEXS & MTBE					
Benzene	µg/L	0.5	<0.5	<0.5	-
Toluene	µg/L	0.5	<0.5	<0.5	-
Ethylbenzene	µg/L	0.5	<0.5	<0.5	-
Xylene (m)	µg/L	0.5	<0.5	<0.5	-
Xylene (o)	µg/L	0.5	<0.5	<0.5	-
Xylenes Total	µg/L	1	<1	<1	-
Styrene	µg/L	0.5	<0.5	<0.5	-
MTBE	µg/L	1	<1	<1	-
Hydrocarbons					
EPH_{10-19}	µg/L	100	<100	<100	-
EPH_{19-32}	µg/L	100	<100	<100	-
LEPH	µg/L	100	<100	<100	-
HEPH	µg/L	100	<100	<100	-

Table 5: Groundwater Quality Assurance/Quality Control Analytical Results

Parameter	Units	RDL	15MW01	Dup 01	RPD
			10-Oct-2015		
Polycyclic Aromatic Hydrocarbons (PAHs)					
Acenaphthene	µg/L	0.05	<0.05	<0.05	-
Acenaphthylene	µg/L	0.05	<0.05	<0.05	-
Acridine	µg/L	0.05	<0.05	<0.05	-
Anthracene	µg/L	0.05	<0.05	<0.05	-
Benz(a)anthracene	µg/L	0.05	<0.05	<0.05	-
Benzo(a) pyrene	µg/L	0.01	<0.01	<0.01	-
Benzo(b)fluoranthene	µg/L	0.05	<0.05	<0.05	-
Benzo(b+j)fluoranthene	µg/L	0.1	<0.1	<0.1	-
Benzo(g,h,i)perylene	µg/L	0.05	<0.05	<0.05	-
Benzo(k)fluoranthene	µg/L	0.05	<0.05	<0.05	-
Chrysene	µg/L	0.05	<0.05	<0.05	-
Dibenz(a,h)anthracene	µg/L	0.05	<0.05	<0.05	-
Fluoranthene	µg/L	0.05	<0.05	<0.05	-
Fluorene	µg/L	0.05	<0.05	<0.05	-
Indeno(1,2,3-c,d)pyrene	µg/L	0.05	<0.05	<0.05	-
Naphthalene	µg/L	0.05	<0.05	<0.05	-
Phenanthrene	µg/L	0.05	<0.05	<0.05	-
Pyrene	µg/L	0.02	0.02	<0.02	-
Quinoline	µg/L	0.1	<0.1	<0.1	-
Volatile Organic Compounds (VOCs)					
1,1,1,2-tetrachloroethane	µg/L	1	<1	<1	-
1,1,1-trichloroethane	µg/L	1	<1	<1	-
1,1,2,2-tetrachloroethane	µg/L	1	<1	<1	-
1,1,2-trichloroethane	µg/L	1	<1	<1	-
1,1-dichloroethane	µg/L	1	<1	<1	-
1,1-dichloroethene	µg/L	1	<1	<1	-
1,2,4-trichlorobenzene	µg/L	1	<1	<1	-
1,2-dibromoethane	µg/L	0.3	<0.3	<0.3	-
1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	-
1,2-dichloroethane	µg/L	1	<1	<1	-
1,2-dichloropropane	µg/L	1	<1	<1	-
1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	-
1,4-dichlorobenzene	µg/L	0.5	<0.5	<0.5	-
Methyl Ethyl Ketone	µg/L	10	<10	<10	-
4-Methyl-2-pentanone	µg/L	10	<10	<10	-
Acetone	µg/L	10	<10	<10	-
Bromodichloromethane	µg/L	1	<1	<1	-
Bromoform	µg/L	1	<1	<1	-
Bromomethane	µg/L	1	<1	<1	-
Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	-
Chlorobenzene	µg/L	1	<1	<1	-
Dibromochloromethane	µg/L	1	<1	<1	-
Chloroethane	µg/L	1	<1	<1	-
Chloroform	µg/L	1	<1	<1	-
Chloromethane	µg/L	1	<1	<1	-
cis-1,2-dichloroethene	µg/L	1	<1	<1	-
cis-1,3-dichloropropene	µg/L	1	<1	<1	-
Dichloromethane	µg/L	1	<1	<1	-
Trichloroethene	µg/L	1	<1	<1	-
Tetrachloroethene	µg/L	1	<1	<1	-
Trihalomethanes	µg/L	2	<2	<2	-
trans-1,2-dichloroethene	µg/L	1	<1	<1	-
trans-1,3-dichloropropene	µg/L	1	<1	<1	-
Trichlorofluoromethane	µg/L	1	<1	<1	-
Vinyl chloride	µg/L	1	<1	<1	-
Laboratory Work Order Number			15V029854	15V029854	
Laboratory Identification Number			7080691	7080695	

Notes:

RDL - Reportable detection limit

RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100

N/A - Not applicable

"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.

BOLD - RPD value greater than 30%

Table 6: Soil Quality Assurance/Quality Control Analytical Results

Parameter	Units	RDL	15MW01	DUP 01	RPD
			9.8-10 m		
			7-Oct-2015		
Physical Parameters					
pH	pH Units	0.1	4.4	4.3	1
Metals					
Antimony	µg/g	0.1	0.5	0.5	0
Arsenic	µg/g	0.1	38.7	37.5	2
Barium	µg/g	0.5	380	400	3
Beryllium	µg/g	0.1	1.1	1.1	0
Cadmium	µg/g	0.01	0.05	0.09	29
Chromium	µg/g	1	32	32	0
Cobalt	µg/g	0.1	6.8	6.8	0
Copper	µg/g	0.2	53.1	70	14
Lead	µg/g	0.1	17.6	18.4	2
Mercury	µg/g	0.01	0.05	0.05	0
Molybdenum	µg/g	0.2	0.7	0.7	-
Nickel	µg/g	0.5	42.6	40.9	2
Selenium	µg/g	0.1	1.3	1.7	13
Silver	µg/g	0.5	<0.5	<0.5	-
Thallium	µg/g	0.1	0.2	0.2	-
Tin	µg/g	0.2	0.8	0.8	-
Uranium	µg/g	0.2	1.2	1.3	4
Vanadium	µg/g	1	82	82	0
Zinc	µg/g	1	87	89	1
BTEXS & MTBE					
Benzene	µg/g	0.02	<0.02	<0.02	-
Toluene	µg/g	0.05	<0.05	<0.05	-
Ethylbenzene	µg/g	0.05	<0.05	<0.05	-
Xylene (m)	µg/g	0.05	<0.05	<0.05	-
Xylene (o)	µg/g	0.05	<0.05	<0.05	-
Xylenes Total	µg/g	0.2	<0.2	<0.2	-
Styrene	µg/g	0.05	<0.05	<0.05	-
MTBE	µg/g	0.1	<0.1	<0.1	-
Hydrocarbons					
LEPH	µg/g	20	62	63	-
HEPH	µg/g	20	111	111	0
VPH C_{6-10}	µg/g	10	<10	<10	-
Polycyclic Aromatic Hydrocarbons (PAHs)					
2-methylnaphthalene	µg/g	0.01	0.04	0.05	-
Acenaphthene	µg/g	0.01	<0.01	<0.01	-
Acenaphthylene	µg/g	0.01	<0.01	<0.01	-
Anthracene	µg/g	0.02	<0.02	<0.02	-
Benz(a)anthracene	µg/g	0.02	<0.02	<0.02	-
Benzo(a) pyrene	ug/g	0.05	0.06	0.08	-
Benzo(b)fluoranthene	µg/g	0.02	0.09	0.12	-
Benzo(g,h,i)perylene	µg/g	0.05	0.70	0.89	12
Benzo(k)fluoranthene	µg/g	0.02	0.02	0.02	-
Chrysene	µg/g	0.05	0.08	0.08	-
Dibenz(a,h)anthracene	µg/g	0.02	<0.02	<0.02	-
Fluoranthene	µg/g	0.05	0.08	0.09	-
Fluorene	µg/g	0.02	<0.02	<0.02	-
Indeno(1,2,3-c,d)pyrene	µg/g	0.02	0.04	0.06	-
Naphthalene	µg/g	0.01	<0.01	<0.01	-
Phenanthrene	µg/g	0.02	0.13	0.15	7
Pyrene	µg/g	0.02	0.15	0.16	3
Volatile Organic Compounds (VOCs)					
1,1,1,2-tetrachloroethane	µg/g	0.05	<0.05	<0.05	-
1,1,1-trichloroethane	µg/g	0.05	<0.05	<0.05	-
1,1,2,2-tetrachloroethane	µg/g	0.05	<0.05	<0.05	-
1,1,2-trichloroethane	µg/g	0.05	<0.05	<0.05	-
1,1-dichloroethane	µg/g	0.05	<0.05	<0.05	-
1,1-dichloroethene	µg/g	0.05	<0.05	<0.05	-
1,2,4-trichlorobenzene	µg/g	0.05	<0.05	<0.05	-
1,2-dibromoethane	µg/g	0.05	<0.05	<0.05	-
1,2-dichlorobenzene	µg/g	0.05	<0.05	<0.05	-
1,2-dichloroethane	µg/g	0.05	<0.05	<0.05	-
1,2-dichloropropane	µg/g	0.05	<0.05	<0.05	-
1,3-dichlorobenzene	µg/g	0.05	<0.05	<0.05	-
1,4-dichlorobenzene	µg/g	0.05	<0.05	<0.05	-
1-Methylnaphthalene	µg/g	0.01	0.05	0.06	9
Methyl Ethyl Ketone	µg/g	0.5	<0.5	<0.5	-
4-Methyl-2-pentanone	µg/g	0.5	<0.5	<0.5	-

Table 6: Soil Quality Assurance/Quality Control Analytical Results

Parameter	Units	RDL	15MW01	DUP 01	RPD
			9.8-10 m		
			7-Oct-2015		
Acetone	µg/g	0.5	<0.5	<0.5	-
Bromodichloromethane	µg/g	0.05	<0.05	<0.05	-
Bromoform	µg/g	0.05	<0.05	<0.05	-
Bromomethane	µg/g	0.05	<0.05	<0.05	-
Carbon tetrachloride	µg/g	0.02	<0.02	<0.02	-
Chlorobenzene	µg/g	0.05	<0.05	<0.05	-
Dibromochloromethane	µg/g	0.05	<0.05	<0.05	-
Chloroethane	µg/g	0.05	<0.05	<0.05	-
Chloroform	µg/g	0.05	<0.05	<0.05	-
Chloromethane	µg/g	0.05	<0.05	<0.05	-
cis-1,2-dichloroethene	µg/g	0.05	<0.05	<0.05	-
cis-1,3-dichloropropene	µg/g	0.05	<0.05	<0.05	-
Dichloromethane	µg/g	0.05	<0.05	<0.05	-
Trichloroethene	µg/g	0.01	<0.01	<0.01	-
Tetrachloroethene	µg/g	0.05	<0.05	<0.05	-
trans-1,2-dichloroethene	µg/g	0.05	<0.05	<0.05	-
trans-1,3-dichloropropene	µg/g	0.05	<0.05	<0.05	-
Trichlorofluoromethane	µg/g	0.05	<0.05	<0.05	-
Vinyl chloride	µg/g	0.05	<0.05	<0.05	-
Organics					
Total Tetrachlorodibenzodioxins	ng/kg	0.5	<0.8	<1	-
Total Tetrachlorodibenzofurans	ng/kg	0.5	<0.6	<1	-
Total PCDDs and PCDFs (TEQ)	ng/kg	-	0.433	0.514	9
Laboratory Work Order Number			15V029854	15V029854	
Laboratory Identification Number			7079507	7079508	

Notes:

RDL - Reportable detection limit

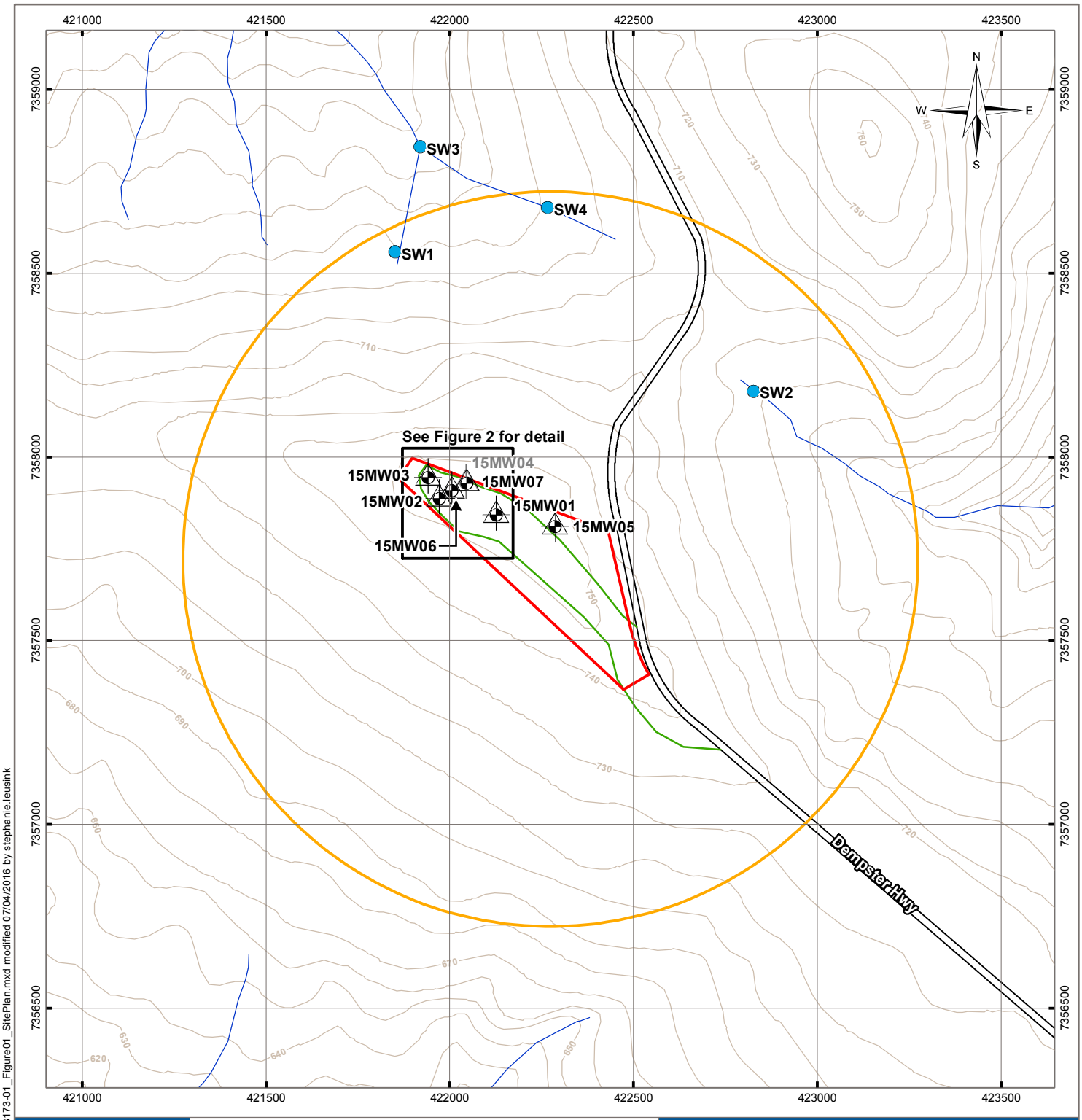
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100

N/A - Not applicable

"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.

BOLD - RPD value greater than 30%

FIGURES



LEGEND

- Monitoring Well
- Decommissioned Monitoring Well
- Surface Water Sampling Location
- Reserve Boundary
- 1 km Buffer
- Treeline
- Dempster Hwy
- Contour (10 m)
- Watercourse

NOTES
Base data source:
CanVec 1:50,000.

STATUS
ISSUED FOR USE

EAGLE PLAINS SOLID WASTE MANAGEMENT FACILITY

Site Plan showing Well Locations

PROJECTION UTM Zone 8			**DATUM** NAD83	**CLIENT** Yukon Government Site Assessments and Remediation Unit
Scale: 1:15,000 — 200 100 0 200 Metres				TETRA TECH EBA
FILE NO. H2O03173-01_Figure01_SitePlan.mxd				
PROJECT NO. ENVH2O03173-01	**DWN** SL	**CKD** MEZ	**APVD** KRR	**REV** 0
OFFICE Tt EBA-VANC	**DATE** March 31, 2016			**Figure 1**

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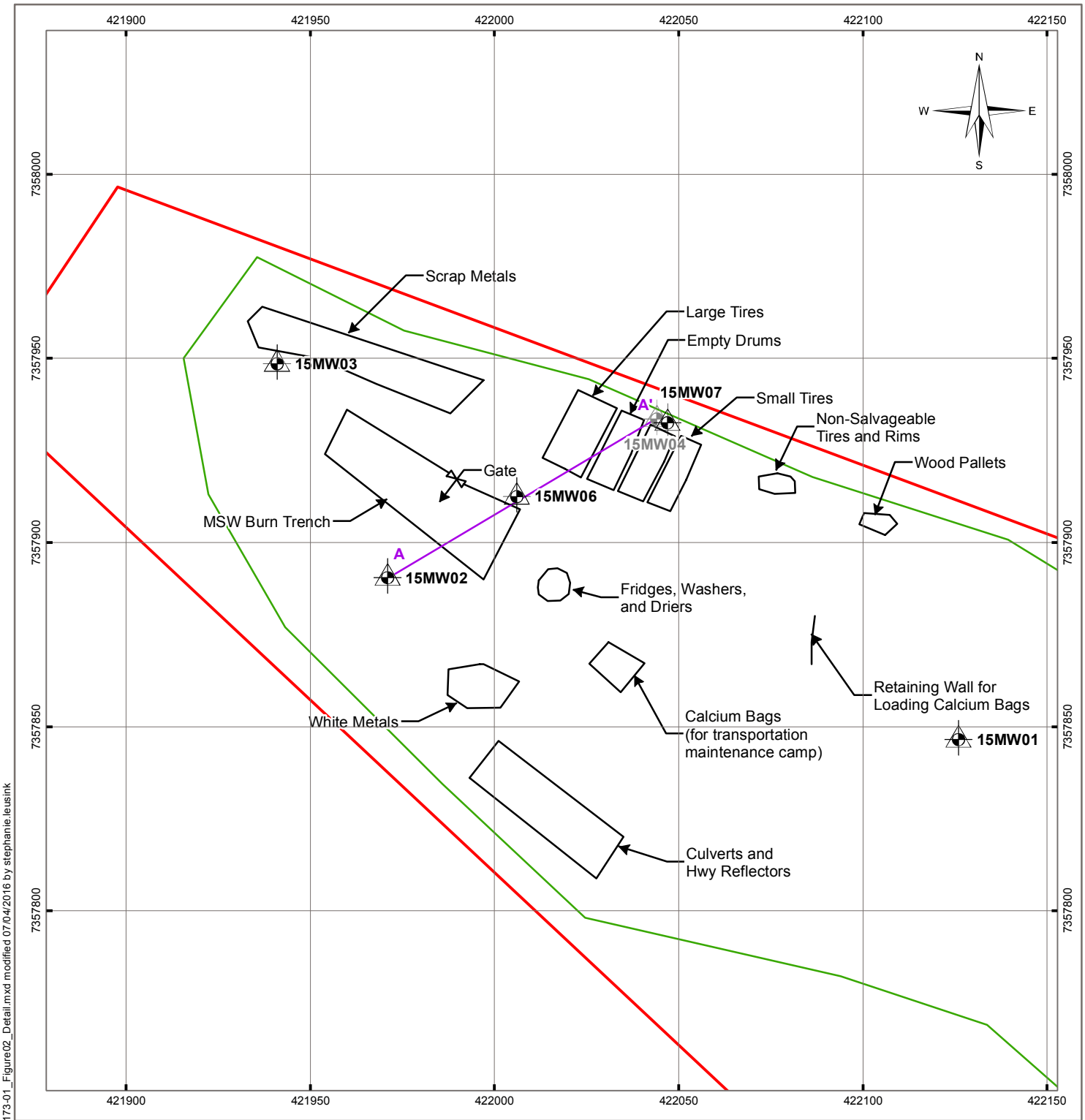

LEGEND

- Monitoring Well
- Decommissioned Monitoring Well
- Reserve Boundary
- Cross Section
- Treeline

EAGLE PLAINS SOLID WASTE MANAGEMENT FACILITY

Site Plan Showing Monitoring Well Locations in the Waste Disposal Area

PROJECTION: UTM Zone 8	DATUM: NAD83			CLIENT: Yukon Government Site Assessments and Remediation Unit
Scale: 1:1,500 (20 10 0 20 Metres)				TETRA TECH EBA
FILE NO.: H2O03173-01_Figure02_Detail.mxd				
PROJECT NO.: ENVH2O03173-01	DWN: SL	CKD: MEZ	APVD: KRR	REV: 0
OFFICE: Tt EBA-VANC	DATE: March 31, 2016			Figure 2

STATUS: ISSUED FOR USE

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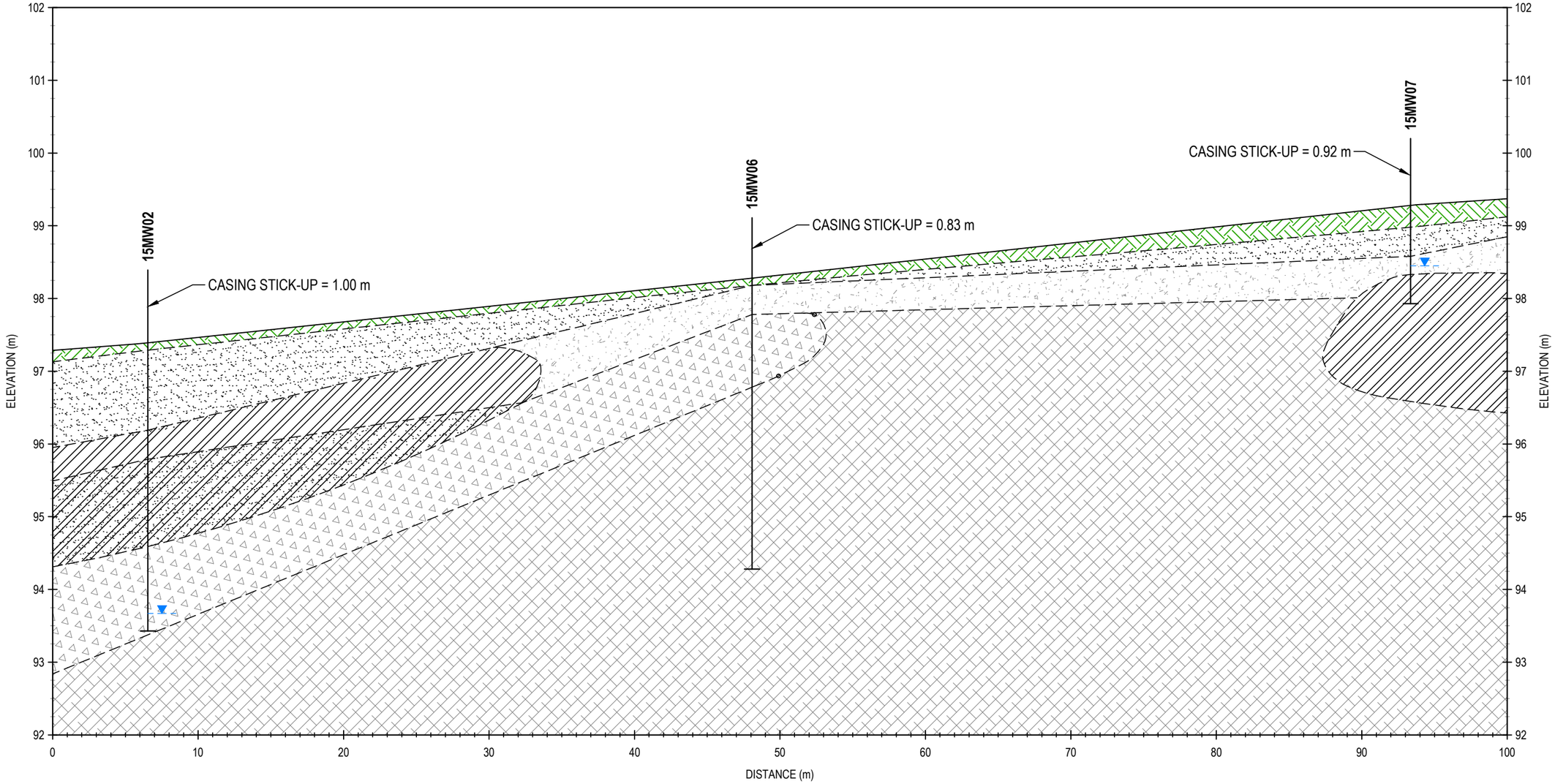


LEGEND

- ORGANICS
- SAND
- SILT
- SAND AND SILT
- SAND AND GRAVEL
- SANDSTONE
- SHALE
- ASSUMED WATER LEVEL

0 15m

Scale: 1:300 @ 11"x17"

HORIZONTAL SCALE

0 2.0m

Scale: 1:60 @ 11"x17"

VERTICAL SCALE

5x VERTICAL EXAGGERATION

CLIENT

YUKON GOVERNMENT
SITE ASSESSMENTS AND REMEDIATION UNIT

EAGLE PLAINS SOLID WASTE MANAGEMENT FACILITY

CROSS-SECTION A - A'

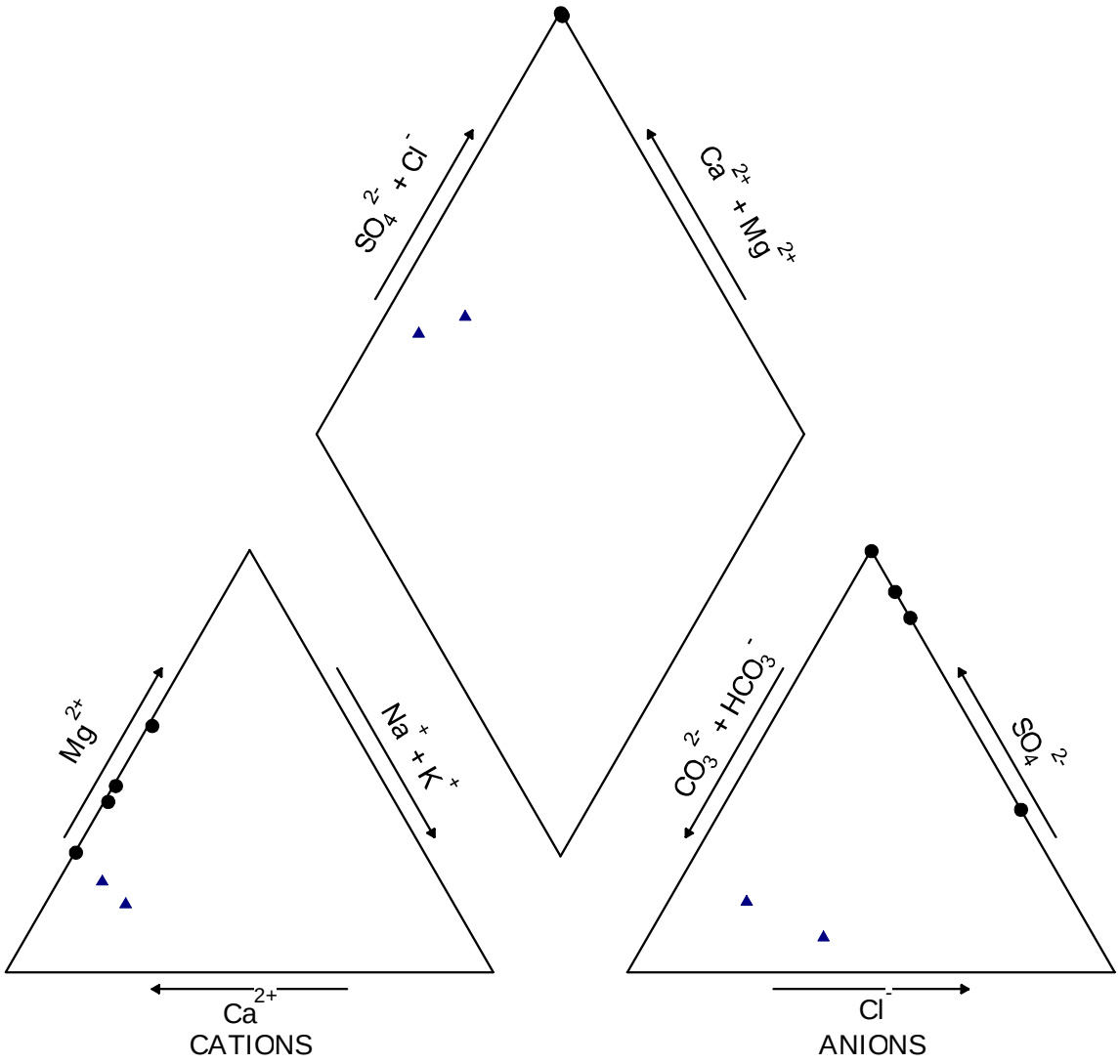
TETRA TECH EBA

PROJECT NO.	DWN	CKD	REV
ENVH2O03172-01	CB	KR	0

OFFICE: EBA-WHSE

DATE: December 7, 2015

Figure 3



LEGEND

- Surface Water Samples
- Groundwater Samples

NOTES

STATUS
ISSUED FOR USE

CLIENT
Yukon Government
Site Assessments and
Remediation Unit

TETRA TECH EBA

EAGLE PLAINS SOLID WASTE MANAGEMENT FACILITY

Piper Plot of Surface Water and Groundwater Chemistry

PROJECT NO.	DWN	CKD	APVD	REV
ENVH2O03173-01	KRR	SK	SK	0

OFFICE	DATE
EBA-WHSE	March 31, 2016

Figure 4

EBA-Tt_Title_Block_8.5x11_Portrait.cdr

PHOTOGRAPHS

Photo 1	Pallets, tires and rims along northern boundary. Photo taken October 7, 2015 at 9:00 am.
Photo 2	Empty fuel drums and tires along northern boundary. Photo taken October 7, 2015 at 9:00 am
Photo 3	Large tires and scrap metal along northern boundary. Photo taken October 7, 2015 at 9:00 am.
Photo 4	Scrap metal along northern boundary. Photo taken October 7, 2015 at 9:01 am.
Photo 5	Refrigerators, washing machines and driers southeast of MSW burn trench. Photo taken October 7, 2015 at 9:02 am.
Photo 6	Calcium bags stored on pallets. Photo taken October 7, 2015 at 9:03 am.
Photo 7	Highway markers along southern boundary. Photo taken October 7, 2015 at 9:03 am.
Photo 8	Culverts and highway markers along southern boundary. Photo taken October 7, 2015 at 9:04 am.
Photo 9	Culverts along southern boundary. Photo taken October 7, 2015 at 9:04 am.
Photo 10	Sandstone encountered at 15MW03 (1.5 – 2.2 m bg). Photo taken on October 7, 2015 at 12:10 pm.
Photo 11	Saturated sand and gravel overlying fine grained silt and clay at 15MW04 at a depth of 0.7 to 1.5 m bg. Photo taken on October 7, 2015 at 2:30 pm.
Photo 12	Organic rich shale bedrock encountered at 15MW01 a depth of 5.5 – 6.0 m bg. Photo taken October 7, 2015 at 4:12 pm.
Photo 13	Organic rich shale encountered at 15MW06 at depth of 3.0 – 3.3 m bg. Photo taken on October 8, 2015 at 11:30 am.
Photo 14	Organics, sand and gravel containing household garbage encountered at 15MW07 at a depth of 0 – 0.3 m bg. Photo taken on October 8, 2015 at 12:07 pm.
Photo 15	Moist to saturated sand and gravel overlying fine grained silt and clay encountered at 15MW07 at a depth of 0.6 – 1.2 m bg. Photo taken on October 8, 2015 at 12:07 pm.
Photo 16	15MW02 taken on October 10, 2015 at 11:57 am.
Photo 17	15MW03 taken on October 10, 2015 at 12:02 pm.
Photo 18	15MW06 taken on October 10, 2015 at 12:08 pm.
Photo 19	15MW07 taken on October 10, 2015 at 12:12 pm.
Photo 20	Empty fuel drums and 15MW07. Photo taken October 10, 2015 at 2:48 pm.
Photo 21	15MW05 taken on October 10, 2015 at 2:51 pm.

Photo 1: Pallets, tires and rims along northern boundary. Photo taken October 7, 2015 at 9:00 am.

Photo 2: Empty fuel drums and tires along northern boundary. Photo taken October 7, 2015 at 9:00 am.

Photo 3: Large tires and scrap metal along northern boundary. Photo taken October 7, 2015 at 9:00 am.

Photo 4: Scrap metal along northern boundary. Photo taken October 7, 2015 at 9:01 am.

Photo 5: Refrigerators, washing machines and driers southeast of MSW burn trench. Photo taken October 7, 2015 at 9:02 am.

Photo 6: Calcium bags stored on pallets. Photo taken October 7, 2015 at 9:03 am.

Photo 7: Highway markers along southern boundary. Photo taken October 7, 2015 at 9:03 am.

Photo 8: Culverts and highway markers along southern boundary. Photo taken October 7, 2015 at 9:04 am.

Photo 9: Culverts along southern boundary. Photo taken October 7, 2015 at 9:04 am.

Photo 10: Sandstone encountered at 15MW03 (1.5 – 2.2 m bg). Photo taken on October 7, 2015 at 12:10 pm.

Photo 11: Saturated sand and gravel overlying fine grained silt and clay at 15MW04 at a depth of 0.7 to 1.5 m bg. Photo taken on October 7, 2015 at 2:30 pm.

Photo 12: Organic rich shale bedrock encountered at 15MW01 a depth of 5.5 – 6.0 m bg. Photo taken October 7, 2015 at 4:12 pm.

Photo 13: Organic rich shale encountered at 15MW06 at depth of 3.0 – 3.3 m bg. Photo taken on October 8, 2015 at 11:30 am.

Photo 14: Organics, sand and gravel containing household garbage encountered at 15MW07 at a depth of 0 – 0.3 m bg. Photo taken on October 8, 2015 at 12:07 pm.

Photo 15: Moist to saturated sand and gravel overlying fine grained silt and clay encountered at 15MW07 at a depth of 0.6 – 1.2 m bg. Photo taken on October 8, 2015 at 12:07 pm.

Photo 16: 15MW02 taken on October 10, 2015 at 11:57 am.

Photo 17: 15MW03 taken on October 10, 2015 at 12:02 pm.

Photo 18: 15MW06 taken on October 10, 2015 at 12:08 pm.

Photo 19: 15MW07 taken on October 10, 2015 at 12:12 pm.

Photo 20: Empty fuel drums and 15MW07. Photo taken October 10, 2015 at 2:48 pm.

Photo 21: 15MW05 taken on October 10, 2015 at 2:51 pm.

Photo 22: 15MW01 taken October 10, 2015 at 11:54 am.

Photo 23: SW1 taken on October 9, 2015 at 1:03 pm.

Photo 24: SW2 taken on October 9, 2015 at 4:03 pm.

Photo 25: SW3 taken on October 9, 2015 at 5:27 pm.

Photo 26: SW4 taken on October 10, 2015 at 2:15 pm.

APPENDIX A
TETRA TECH'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEOENVIRONMENTAL 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 Tetra Tech EBA’s client. Tetra Tech 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 Tetra Tech EBA’s Client unless otherwise authorized in writing by Tetra Tech EBA. Any unauthorized use of the report is at the sole risk of the user.

2.0 ALTERNATE REPORT FORMAT

Where Tetra Tech EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed Tetra Tech 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 Tetra Tech EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of Tetra Tech EBA’s instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Tetra Tech EBA. The Client warrants that Tetra Tech EBA’s instruments of professional service will be used only and exactly as submitted by Tetra Tech EBA. The use and alteration of raw data (data submitted in Excel format and AutoCAD files) provided to the Client as part of this project (e.g., for inclusion into an external database) is permitted at the sole risk of the Client. Tetra Tech EBA does not accept any responsibility for the accuracy of any further product or analysis completed by others based on the raw data provided.

Electronic files submitted by Tetra Tech EBA have been prepared and submitted using specific software and hardware systems. Tetra Tech 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 Tetra Tech EBA in its reasonably exercised discretion.

4.0 INFORMATION PROVIDED TO TETRA TECH EBA BY OTHERS

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

APPENDIX B

EAGLE PLAINS SWF PERMIT (NO. 80-011)

Yukon
Environment

Permit No: 80-011

WASTE MANAGEMENT PERMIT

Issued for the Operation of a Waste Disposal Facility and a Special Waste Management Facility
Pursuant to the *Environment Act*, the *Solid Waste Regulations*
and the *Special Waste Regulations*

Permittee: Yukon government, Highways & Public Works

Mailing Address: Box 2703 (W-12), Whitehorse, YT Y1A 2C6

Site Location: Waste disposal facilities listed in Appendix A

Authorized Representative: Michael McArthur
Phone/Fax: (867) 667-5452 / (867) 667-5761
Email: Michael.McArthur@gov.yk.ca

Effective Date: Date of Director's Signature
Expiry Date: December 31, 2023

This permit replaces permit #80-011 issued on August 26, 2013.

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

a. operate the waste disposal facilities listed in Appendix A; and
b. operate a special waste management facility for the collection and storage of all special wastes, excluding those in Class 1 and Class 7 as defined in the *Transportation of Dangerous Goods Act* (Canada), at the above site location (the "site"); and
c. transport: all special wastes, excluding those in Class 1 and Class 7 as defined in the *Transportation of Dangerous Goods Act* (Canada), to and from the above site location (the "site"), as set out in the terms and conditions of this permit.

Dated this 27th day of October, 2015

Director, Environmental Programs Branch
Environment Yukon

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
Date: 27.Oct.15 Initials: JCM

1. DEFINITIONS

1. In this permit,

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

"alternative cover material" means cover material approved by an environmental protection analyst that is not earthen material and is placed over exposed waste in a cell on a permanent or temporary basis;

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

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

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

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

"closure" means activities undertaken to reduce the environmental impact of a facility when a cell reaches capacity or the facility is no longer accepting waste, such as placing final cover material over cells or restricting public access to the site, and may refer to closure of an individual cell or closure of an entire facility;

"construction and demolition waste" means the debris generated during the construction, renovation, and demolition of buildings, structures, roads, and bridges (e.g., concrete, wood, drywall, metals, glass, and salvaged building components);

"contaminated material" means any soil, snow, sediment or water that has one or more parameters in excess of applicable standards in the *Contaminated Sites Regulation*, O.I.C. 2002/171;

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

"designated materials" means all materials identified in Schedule A of the *Designated Materials Regulation*, O.I.C. 2003/184;

"disposal areas" means the location(s) of the cell(s);

"environmental protection analyst" means an employee of the Branch so designated by the Minister of Environment under the Act;

"environmental protection officer" means an employee of the Government of Yukon so designated by the Minister of Environment under the Act;

"facility" means the waste disposal facility and the special waste management facility located at the site;

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

"modified transfer station" means a waste disposal facility where construction and demolition waste is permanently disposed on site and all other types of waste are

removed from the site for recycling or disposal at another location permitted to accept those wastes;

"ODS" means an ozone-depleting substance or other halocarbon identified in the *Ozone-Depleting Substances and Other Halocarbons Regulation, O.I.C. 2000/127;*

"putrescible waste" means food- or plant-based waste which can decompose or rot;

"qualified professional" means a person with a post-secondary education and/or professional experience in a relevant field that is technically capable of performing the work in the opinion of an environmental protection analyst;

"Regulations" means any or all of the *Air Emissions Regulations*, O.I.C. 1998/207, the *Solid Waste Regulations*, O.I.C. 2000/11, the *Contaminated Sites Regulation*, O.I.C. 2002/171, the *Designated Materials Regulation*, O.I.C. 2003/184, the *Ozone Depleting Substances and Other Halocarbons Regulation,* O.I.C. 2000/127, the *Storage Tank Regulations,* O.I.C. 1996/194, the *Spills Regulations*, O.I.C. 1996/193, and the *Special Waste Regulations*, O.I.C. 1995/047, as applicable;

"solid waste" includes waste which originates from residential, commercial, industrial or institutional sources or from the demolition or construction of buildings or other structures, or which is specified in a solid waste management plan to be solid waste and for greater certainty includes litter, as defined in the *Act*, but does not include untreated brush or wood products that are not mixed with other materials;

"special waste management facility" means an operation which handles or disposes special wastes generated by other persons or operations, and includes without limitation a community collection system which is intended to collect or transport special waste to a special waste management facility in the Yukon;

"service area" means the population that is anticipated to be served by a facility, whether or not that population resides entirely within municipal or other boundaries;

"spill" means a spill in excess of the amounts specified in Schedule A of the *Spills Regulations*, O.I.C. 1996/193, or that is abnormal in quantity or quality in light of all the circumstances of the release;

"storage tank" means a closed container with a capacity of more than 230 litres that is designed to be installed in a fixed location, and includes either an aboveground storage tank or an underground storage tank;

"substance" means a hazardous substance, pesticide, contaminant, or special waste;

"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 waste is permanently disposed on site, and all types of waste are removed from the site for recycling or disposal at another location permitted to accept those wastes;

"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.

2. GENERAL

1. No condition of this permit limits the applicability of any other law or bylaw.

2. The permittee shall ensure that all activities authorized by this permit occur on property that the permittee has the right to enter upon and use for that purpose.

3. The permittee shall ensure that all associated personnel:
   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.
4. The permittee shall provide notice in writing to an environmental protection analyst prior to any significant change of circumstances at the site, including without limitation:
   a) closure of the facility;
   b) change of ownership of the facility;
   c) discontinuation of any regulated activity;
   d) collecting or transporting special wastes other than those authorized by this permit; or
   e) a change to the mailing address or phone number of the permittee.

5. Where conflicts exist between this permit, the permit application or elements of any plan pertaining to any activity regulated under the Act, this permit shall prevail.

6. If an inspection reveals that the facility or equipment is in any way not in compliance with this permit or approved plans developed in accordance with this permit, the permittee shall repair the damage or take other actions as required to bring the facility or equipment into compliance.

7. For clarity, all obligations of the permittee under this permit survive the expiry.

3. PLANS

1. The document entitled "Swift River Solid Waste Management Facility Solid Waste Management Plan 2013-2023," prepared by Tetra Tech EBA and dated July 2014, is a waste management plan approved by the Branch that will expire on June 30, 2023.

2. The permittee shall amend the document entitled "Drury Creek Solid Waste Management Facility Solid Waste Management Plan 2013-2023," prepared by Tetra Tech EBA and dated July 2014, in accordance with the letter from the Branch regarding the Drury Creek waste management plan dated December 4, 2014, and shall submit the amended waste management plan to an environmental protection analyst by January 31, 2016.

3. The permittee shall amend the document entitled "Eagle Plains Solid Waste Management Facility Solid Waste Management Plan 2013-2023," prepared by Tetra Tech EBA and dated July 2014, in accordance with the letter from the Branch regarding the Eagle Plains waste management plan dated December 4, 2014, and shall submit the amended waste management plan to an environmental protection analyst by January 31, 2016.

4. The permittee shall submit an updated waste management plan to the Branch one year in advance of the expiry of an approved waste management plan for the facility, or as otherwise directed in writing by an environmental protection analyst.

5. When the permittee is required to submit a plan, report or other document under this permit, the permittee shall:
   a) ensure the plan, report or other document meets the requirements for that type of plan, report or other document as established by the Branch in writing;
   b) submit the plan, report or other document in writing to an environmental protection analyst;
   c) not undertake any of the activities described in the plan, report or other document until it is approved in writing by an environmental protection analyst;
   d) implement the plan, report or other document as of the date it is approved in writing by an environmental protection analyst; and
   e) ensure that all associated personnel are familiar with the plan, report or other document.

6. If the permittee wants to amend an approved plan, report or other document, the permittee shall submit the proposed amendment to an environmental protection analyst as if the amendment were a plan, report or other document under section 3.5 of this permit.

7. If an environmental protection analyst directs in writing and with reasons that an approved plan, report or other document be amended, the permittee must prepare the required amendment and submit it as if it were a plan, report or other document referred to in section 3.5 of this permit.

4. FENCING AND SECURITY

1. The permittee shall install and maintain, in accordance with written guidelines developed by the Branch, an electric exclusion fence(s) and gates that encompass all putrescible waste storage and disposal areas at each facility. The permittee shall ensure that all substances that are an attractant to animals are stored within the perimeter of the electric fence or shall expand the electric fence to encompass the storage areas for those substances. 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 4.1 above must be:
   a) activated continuously from April 1 to November 30 of each year;

b) activated between December 1 and March 31 of each year if there are tracks or other signs of dangerous wildlife attempting to access the facility; and
c) activated upon the written direction of an environmental protection officer.

3. If the permittee wishes to deactivate the electric fence for any length of time during the period of operation referenced in paragraph 4.2, except as required for routine fence maintenance, the permittee shall obtain prior written or verbal approval from an environmental protection officer.
4. The permittee shall conduct weekly inspections of all electric fences and shall maintain them as necessary during periods of activation as specified in paragraph 4.2 to ensure that:
   a) the fence is sufficiently charged to deter dangerous wildlife;
   b) the fence has not been breached by wildlife and there are no signs of digging underneath the fence by dangerous wildlife;
   c) there is no vegetation, windblown litter or other items along the perimeter of the fence, or contacting the fence, that may act as a ground; and
   d) there are no trees or snow drifts near the fence that would allow dangerous wildlife to enter the facility over the fence.

5. During the weekly inspections referred to in paragraph 4.4, the permittee shall inspect the fence perimeter for tracks or other signs of dangerous wildlife attempting to access the facility.

6. If the facility is 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.

7. If the facility is 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.

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

9. The permittee shall install and maintain signs marking the areas, if any, of the 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.

10. The permittee shall report any incidents involving dangerous wildlife to the Government of Yukon, Conservation Officer Services Branch or the TIPP line (**1-800-661-0525**).

5. SIGNAGE AND SEGREGATION

1. The permittee shall install and maintain signs at the facility visible to the public containing the telephone contact numbers for the facility manager, the local fire protection services, the district conservation officer, and the 24-hour Yukon Spill Report Centre (**867-667-7244**).

2. The permittee shall:
   a) establish and maintain separate areas for the collection of each type of solid waste, special waste, and designated materials accepted at the facility, including, but not limited to, electronic and electrical waste;
   b) install and maintain appropriate signs identifying each of these areas; and
   c) ensure that the facility is maintained to enable vehicles to access each of these areas.
3. The permittee shall conduct weekly visual site inspections to verify correct segregation of wastes and shall transfer all improperly segregated wastes to their appropriate areas, with the exception of removing wastes from the area where waste originating from domestic sources is disposed of.

4. The permittee shall install and maintain signs, no later than June 30, 2016, identifying appropriate disposal information, or phone number(s) or website(s) to consult for appropriate disposal information, for common special wastes including, but not limited to:
   - Waste oil
   - Waste antifreeze
   - Waste batteries
   - Waste solvents
   - Waste fuels
   - Waste pesticides
   - Waste fluorescent tubes
   - Waste aerosol cans
   - Waste cleaners

6. SOLID WASTE OPERATIONS

1. The permittee shall ensure that all solid waste to be disposed of at the facility is deposited into a cell in accordance with this permit.

2. The permittee shall ensure that all putrescible solid waste to be transferred offsite is collected and stored in containers and that it is not stored for a period of greater than fourteen days prior to being transferred offsite.

3. The permittee shall receive written authorization from the operator of any municipal or Yukon government solid waste disposal facility prior to transferring any waste to that facility.

4. The permittee shall cover any exposed solid waste in a cell that could be moved by animals or wind 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.

5. Paragraph 6.4 does not apply between November 15 and April 15 of each year if soil or other comparable cover material cannot be obtained within the service area. Should weather conditions preclude obtaining cover material outside the aforementioned dates, the permittee shall obtain written or verbal approval from an environmental protection officer.

6. The permittee may comply with paragraph 6.4 by covering exposed solid waste in a cell with an alternative cover material.

7. The permittee shall ensure that animal carcasses and animal parts (excluding carcasses, bones, etc. that are included with domestic food wastes) are buried at a landfill or modified transfer station at least 2 metres below the surface of the land, or by other means made inaccessible to animals, or transported to a permitted landfill or modified transfer station.

8. The permittee shall ensure that snow is stockpiled in a manner that will minimize the generation of leachate from active and closed cells.

9. The permittee shall submit to an environmental protection analyst for approval copies of all laboratory analytical results of any contaminated material before accepting it at the facility for deposition into a cell, and shall not allow materials containing contaminants in excess of the industrial land use standards in the *Contaminated Sites Regulation*, O.I.C. 2002/171, to be deposited into a cell.

7. FACILITY SPECIFICATIONS

1. The permittee shall submit a cell siting and construction plan for approval in accordance with written guidelines developed by the Branch prior to developing any new cells.

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

3. The permittee shall ensure that transfer bins are equipped with lids to prevent infiltration of precipitation and scavenging by birds and other animals.

4. The permittee shall ensure that all cells or portions of cells no longer used for the disposal of solid waste are covered with a geomembrane or a clay or composite liner that meets the thickness and permeability requirements for final cover material as established by the Branch in writing.

5. The permittee shall conduct inspections and maintenance of all cells or portions of cells that have been covered with final cover material as described in paragraph 7.2, as required to ensure the integrity of the cover material placed over the closed cells or portions of cells.

6. The permittee shall divert surface water from flowing into or pooling in or on active and closed cells through the use of controls such as trenches, berms, and grading techniques. For clarity, the permittee is not required to remove precipitation that falls on active or closed cells.

7. The permittee shall submit a closure plan for approval in accordance with written guidelines developed by the Branch and apply for a permit amendment prior to closing any facility.

8. MONITORING

1. The permittee shall install and maintain, at minimum, one monitoring well upgradient and two monitoring wells downgradient of the facility suitable for the detection of impacts to groundwater from the facility or as otherwise directed in Appendix B, as updated from time to time by the Director of the Environmental Programs Branch. All active groundwater monitoring wells shall be maintained in good operating condition.

2. The permittee shall submit for approval, no later than March 31, 2016, a hydrogeological assessment of the Eagle Plains facility. The hydrogeological assessment must include the installation of one upgradient and two downgradient groundwater monitoring wells, at minimum, suitable for the detection of impacts to groundwater. The hydrogeological assessment shall include an evaluation of groundwater flow direction and gradient, estimated groundwater travel time to nearby receptors, and preparation of a conceptual hydrogeological model for the site. The report shall include a ground temperature monitoring plan for the site that will adequately monitor impacts to permafrost.

3. The permittee shall ensure that any groundwater monitoring wells that are damaged, obstructed, or otherwise compromised are rehabilitated or decommissioned in accordance with the *Contaminated Sites Regulation*, O.I.C. 2002/171, Protocol 7: Groundwater Monitoring Well Installation, Sampling and Decommissioning, and replaced if necessary in accordance with paragraph 8.1.

4. The permittee shall conduct the work described in Appendix B, as updated from time to time by the Director of the Environmental Programs Branch, in accordance with all applicable protocols pursuant to the *Contaminated Sites Regulation*, O.I.C. 2002/171 and prior to the due date for the work.

5. The permittee shall submit records of the work identified in paragraph 8.4 within 60 days of conducting the work, including borehole logs, water elevation data, and geographic coordinates for each groundwater monitoring well or surface water monitoring location, as applicable. The permittee shall include a statement as to whether information gathered during the work changes the conclusions of the hydrogeological assessment report previously prepared for the facility.

6. If information gathered during the work identified in paragraph 8.4 changes the conclusions of the hydrogeological assessment report previously prepared for the

facility, the permittee shall update the hydrogeological assessment, including, but not limited to, groundwater flow direction and gradient, estimated groundwater travel time to nearby receptors, and the conceptual hydrogeological model. The permittee shall submit any updated hydrogeological assessments for approval within 90 days of conducting the work.

7. The permittee shall ensure that samples are collected and analyzed from all active groundwater monitoring wells at each facility in accordance with the facility-specific monitoring details in Appendix B, as updated from time to time by the Director of the Environmental Programs 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 after the wells have thawed and once in the fall prior to the wells freezing, or as otherwise directed in Appendix B, as updated from time to time by the Director of the Environmental Programs Branch.

8. The permittee shall ensure that samples are collected and analyzed, using generally-accepted sampling practice, from all downgradient surface water bodies within 1 km of the facility that are identified in the hydrogeological assessment as being potentially impacted by the facility, in accordance with Appendix B, as updated from time to time by the Director of the Environmental Programs Branch. Samples shall be taken twice each year the permit is in effect, once in the spring and once in the fall, concurrently with each groundwater sampling event if possible, or as otherwise directed in Appendix B, as updated from time to time by the Director of the Environmental Programs Branch.

9. All water quality sampling must be conducted in accordance with all applicable protocols pursuant to the *Contaminated Sites Regulation*, O.I.C. 2002/171, that pertain to sampling and analysis. Sample collection must be carried out by trained personnel using appropriate equipment and procedures. All water samples 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.

10. All groundwater samples shall be analyzed for the following parameters in the field:
    - Temperature
    - Specific conductance
    - Oxidation-reduction potential
    - Dissolved oxygen
    - pH

    and the following parameters in the lab:
    - Major ions (Calcium, Magnesium, Sodium, Potassium, Chloride, Sulphate, Nitrate Nitrogen, Nitrite Nitrogen, Phosphate)
    - Dissolved metals
    - Hardness
    - Alkalinity
    - Carbonate
    - Bicarbonate
    - pH

- Specific conductance
- Total dissolved solids
- Ammonia
- Dissolved organic carbon
- Volatile organic compounds
- Chemical oxygen demand
- $LEPH_W$ (Light Extractable Petroleum Hydrocarbons in Water)
- EPH_{W10-19} (Extractable Petroleum Hydrocarbons in Water, C10-C19)
- VH_{W6-10} (Volatile Petroleum Hydrocarbons in Water, C6-C10)
- VPH_W (Volatile Petroleum Hydrocarbons in Water)
- BTEX (Benzene, Toluene, Ethylbenzene, and Total Xylenes)
- PAHs (Polycyclic Aromatic Hydrocarbons)

or as otherwise directed in Appendix B, as updated from time to time by the Director of the Environmental Programs Branch.

11. All surface water samples shall be analyzed for the following parameters in the field:
    - Temperature
    - Specific conductance
    - Oxidation-reduction potential
    - Dissolved oxygen
    - pH

    and the following parameters in the lab:
    - Major ions (Calcium, Magnesium, Sodium, Potassium, Chloride, Sulphate, Nitrate Nitrogen, Nitrite Nitrogen, Phosphate)
    - Total metals
    - Hardness
    - Alkalinity
    - Carbonate
    - Bicarbonate
    - pH
    - Specific conductance
    - Total dissolved solids
    - Ammonia
    - Total organic carbon
    - Chemical oxygen demand
    - Biochemical oxygen demand
    - $LEPH_W$ (Light Extractable Petroleum Hydrocarbons in Water)
    - EPH_{W10-19} (Extractable Petroleum Hydrocarbons in Water, C10-C19)
    - VH_{W6-10} (Volatile Petroleum Hydrocarbons in Water, C6-C10)
    - VPH_W (Volatile Petroleum Hydrocarbons in Water)
    - BTEX (Benzene, Toluene, Ethylbenzene, and Total Xylenes)
    - PAHs (Polycyclic Aromatic Hydrocarbons)

    or as otherwise directed in Appendix B, as updated from time to time by the Director of the Environmental Programs Branch.

12. If the results of the analyses required under paragraphs 8.10 or 8.11 show deteriorating water quality with respect to any of the substances set out in Schedule 3 of the *Contaminated Sites Regulation*, O.I.C. 2002/171, as described in CSR Protocol 13: Adaptive Management, the permittee shall submit an adaptive management plan to address the contamination in accordance with that Protocol.

13. The permittee shall submit for approval a groundwater and surface water monitoring plan for each facility, prepared by a qualified professional, that includes, but is not limited to, recommended monitoring locations, monitoring frequency, and parameters, no later than January 31, 2017.

14. The permittee shall conduct ground temperature monitoring at the Eagle Plains facility in accordance with an approved ground temperature monitoring plan and the facility-specific monitoring details in Appendix B, as updated from time to time by the Director of the Environmental Programs Branch.

9. TRANSFER STATIONS

1. Following the conversion of a landfill or modified transfer station to a transfer station, the permittee shall submit a follow up report for approval documenting the cell closure activities conducted at the facility in accordance with written guidelines developed by the Branch.

2. The permittee shall conduct water quality monitoring at the Eagle Plains facility in accordance with Part 8 of this permit for twenty-five years following approval of the follow up report submitted in accordance with paragraph 9.1, or as otherwise directed in Appendix B, as updated from time to time by the Director of the Environmental Programs Branch.

3. At the end of the sampling period specified in paragraph 9.2, the permittee shall ensure that all groundwater monitoring wells are decommissioned in accordance with the *Contaminated Sites Regulation*, O.I.C. 2002/171, Protocol 7: Groundwater Monitoring Well Installation, Sampling and Decommissioning.

10. STORAGE AND HANDLING OF SPECIAL WASTE

1. The permittee shall not handle special wastes other than those authorized by this permit.

2. The permittee shall not discard, destroy, treat, process, incinerate, or recycle special wastes unless specifically authorized by this permit, except for mixing or dilution authorized by an environmental protection officer as an acceptable treatment or disposal option for the special waste.

3. The permittee shall not combine different types of special waste in the same container.

4. The permittee shall ensure that special wastes are stored and handled in such a manner as to prevent their release into the environment.

5. The permittee shall ensure that:
    a. all drums and other portable containers containing special wastes are covered or stored out of inclement weather;
    b. all drums and other portable containers containing special wastes are stored off the ground;
    c. all containers used to store special waste are closed at all times during storage;
    d. special wastes are stored in a manner that will prevent incompatible substances from reacting adversely with each other;
    e. containers used for the storage of special waste are made of materials that will not adversely react with the special waste;
    f. special wastes stored in leaking containers are immediately transferred to intact containers; and
    g. all containers used for the storage of special waste are clearly marked to identify what special waste is stored in the container.

6. The permittee shall inspect special waste storage containers:
    a) weekly in terms of visual inspections for leaks;
    b) monthly in terms of an inventory of special wastes stored on site;
    c) annually in terms of tank/container quality, piping, and auxiliary equipment; and
    d) upon request from an environmental protection officer.

7. The permittee shall not release any residue at the bottom of a container used for the storage of special waste to the environment. Such residue shall be collected by the permittee and considered to be special waste until proven by testing to not be special waste.

8. The permittee shall not store special wastes in a storage tank unless specifically authorized by a permit issued pursuant to the *Storage Tank Regulations*, O.I.C. 1996/194.

9. The permittee shall ensure that public access to all special waste storage and handling areas is prevented, except as required during regular operating hours.

10. If an inspection reveals that the amount of special waste stored at the site may pose a risk to human health or the environment, the permittee shall develop and implement a final disposal plan for the special waste, as directed in writing by an environmental protection officer.

11. TRANSPORT AND TRANSFER OF SPECIAL WASTE

1. The permittee shall ensure that all special wastes are transported and transferred in such a manner as to prevent their release into the environment.

2. The permittee shall complete a waste manifest documenting each shipment of special wastes from the site. The permittee shall distribute copies of the waste manifest in the manner described thereon.
3. The permit number **YG80-011** shall be used as the Provincial Identification Number on waste manifests used for the transport of special wastes.

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

5. The permittee shall ensure that special wastes are transported to a special waste management facility in the Yukon or another jurisdiction that is permitted to receive those special wastes.

6. The permittee shall ensure that special wastes are transported by a carrier permitted in the Yukon to transport the special wastes.

12. SPILLS

1. The permittee shall contact either an environmental protection officer, or the 24-hour Yukon Spill Report Centre (**867-667–7244**) as soon as possible under the circumstances in the event of a release, spill, unauthorized emission, discharge, or escape of any substance listed in the *Spills Regulations*, O.I.C. 1996/193, or any special wastes.

2. The permittee shall ensure that clean-up equipment appropriate for the amount and type of special waste stored on site (such as sorbent, shovel, broom, bucket, gloves, boots, etc.) is readily accessible at all locations where special wastes are handled or stored.

3. The permittee shall ensure that spill procedures are developed, maintained, and posted at all locations where special wastes are handled or stored, and that all associated personnel are familiar with those procedures. The spill procedures must meet the requirements for that type of plan as established by the Branch in writing.

4. In the event that an inspection or other information leads the proponent to believe that ODS are being released into the environment from an appliance or other container deposited at the site, the proponent shall ensure that the ODS are removed from the appliance or other container in accordance with the *Ozone-Depleting Substances and Other Halocarbons Regulation,* O.I.C. 2000/127.

5. The permittee shall ensure that contaminated material resulting from a release, spill, unauthorized emission, discharge, or escape of any substance listed in the *Spills Regulations*, O.I.C. 1996/193, or any special wastes is properly handled in accordance with the *Contaminated Sites Regulation*, O.I.C. 2002/171.

13. ANNUAL REPORT

1. The permittee shall submit for approval an annual report for each facility summarizing activities carried out under this permit. The annual report shall be submitted prior to

March 31st of the year following each year that the permit is in effect in a format acceptable to an environmental protection analyst, and shall cover the period from January 1st to December 31st. The annual report shall include the information described in this Part and any other information as required by an environmental protection analyst. If there is no information to report for a particular section of the annual report, the permittee shall explicitly include a statement to that effect in the annual report.

2. The annual report described in paragraph 13.1 shall include the following information related to water quality monitoring:
   a) PDF laboratory analytical certificates and Excel spreadsheets of all water quality data collected in accordance with the facility-specific monitoring details in Appendix B, including purge volumes, water level measurements, and visual observations of turbidity;
   b) An analysis of the water quality data by a qualified professional, including the qualified professional's opinion on:
      a. Data quality;
      b. Sampling or analytical errors and anomalies;
      c. Recommendations for data improvement and/or resampling;
      d. Any updates to, or confirmations of, the conceptual hydrogeological model for the site;
      e. Groundwater flow direction;
      f. Exceedances of the applicable *Contaminated Sites Regulation* water use standards; and
      g. Observed or suspected impacts to water quality, including an analysis of spatial and temporal trends in contaminant concentrations over the previous 3 years;
   c) A list of any groundwater monitoring wells that are known or suspected to be damaged or obstructed, and any actions taken to rehabilitate or decommission those groundwater monitoring wells;
   d) A list of any groundwater monitoring wells that were decommissioned; and
   e) A list and description of any new groundwater monitoring wells that were installed.

3. The annual report described in paragraph 13.1 shall include the following information related to cell construction, maintenance, and closure activities:
   a) Details of any cells fully or progressively closed in accordance with written guidelines developed by the Branch;
   b) The results of inspections of cover material placed over fully or progressively closed cells, including any evidence of erosion, ponding, settlement and revegetation, and a general description of any maintenance conducted to maintain the cover material integrity;
   c) A description of any existing cells that are expected to reach capacity within a period of 12 months and/or any plans to construct new cells within a period of 12 months, and an estimate of when the cell(s) will be closed or constructed; and
   d) An updated site diagram depicting the location of all active and closed cells, groundwater monitoring wells, and solid and special waste storage locations, or

confirmation that the site diagram submitted with the previous annual report is still accurate.

4. The annual report described in paragraph 13.1 for the Eagle Plains facility shall contain the following information related to ground temperature monitoring:
   a) All ground temperature data collected; and
   b) In every 3rd annual report, an analysis of the ground temperature data by a qualified professional, beginning with the 2017 annual report, including, but not limited to, the qualified professional's opinion on:
      a. Observed or suspected impacts to permafrost, including an analysis of spatial and temporal trends in ground temperature over the previous 3 years; and
      b. Recommended mitigation measures, if applicable.

14. RECORDS

1. The permittee shall keep the following records at their office:
   a) an updated site plan showing the location of all active and closed cells and solid and special waste segregation areas at the facility;
   b) a copy of each plan submitted under this permit, and any amendments to and approvals of each plan;
   c) summaries of all inspections carried out by the permittee 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);
   d) results of surface water and groundwater testing conducted at the site, including any interpretations of monitoring results to determine trends in contaminant levels over time;
   e) reports on hydrogeological assessments undertaken at the site;
   f) notes concerning any release, spill, unauthorized emission, discharge or escape that occurred at the facility, including the substance involved and estimated quantity, the date of observation, any spill reports made, and clean-up procedures implemented;
   g) any deficiencies remedied in accordance with paragraph 2.6, and how and when they were remedied;
   h) a copy of any waste manifests used to transport special wastes to or from the facility;
   i) before and after photographs and a detailed description of any activities undertaken to construct a new cell; and
   j) before and after photographs and a detailed description of any activities undertaken to close a cell.

2. 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.

APPENDIX A: WASTE DISPOSAL FACILITIES

Facility Name	Facility Type	Location
Drury Creek	Landfill	km 470.1 Robert Campbell Hwy Disposition 15304 134°23'W, 62°12'N
Eagle Plains	Transfer station	Km 386 Dempster Hwy Disposition 106I07-008 136°44'W, 66°19'N
Swift River	Landfill	km 1169.3 Alaska Hwy Disposition 2000-0630 131°25'W, 60°25'N

Eagle Plains*

Groundwater Flow Direction: To be determined

Groundwater Monitoring Wells

Well ID	Classification
To be determined	

Surface Water Monitoring Locations

Location ID	UTM Zone	UTM Easting	UTM Northing
To be determined			

Ground Temperature Monitoring

Thermistor ID
To be determined

*Groundwater flow direction and information for groundwater monitoring well ID, surface water monitoring location ID, and thermistor ID shall be determined based on the hydrogeological assessment report for the facility, which is to be submitted by March 31, 2016 in accordance with paragraph 8.2 of the permit.

Director, Environmental Programs Branch

October 27, 2015
Date

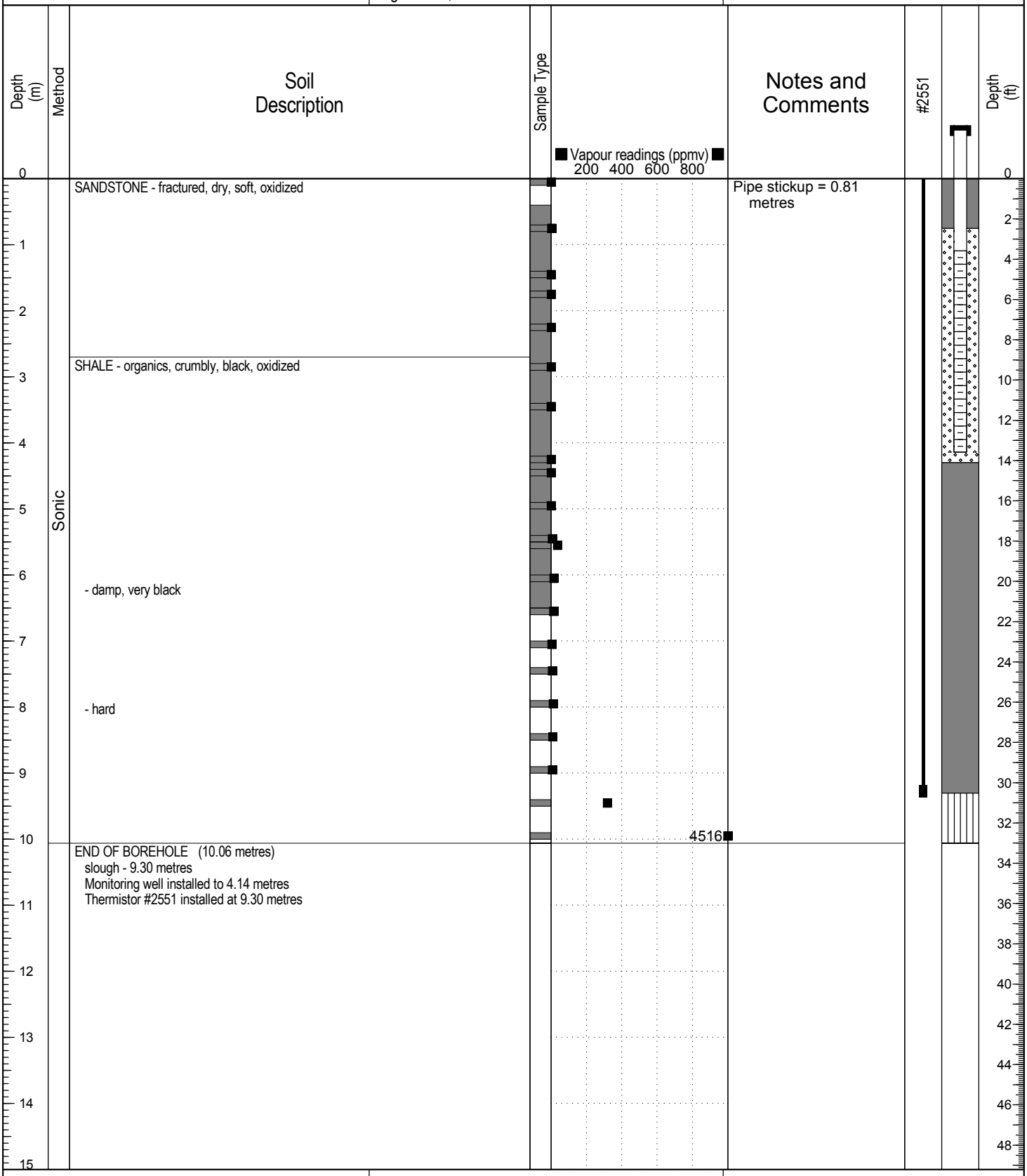
DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
Date: 27/10/15 Initials:

APPENDIX C
GROUNDWATER MONITORING WELL LOGS

Government of Yukon - Site Assessment & Remediation

Borehole No: **15MW01**

Project: Hydrogeological Assessment Eagle Plains SWF	Project No: ENVH2O03173-01
Location:	
Eagle Plains, Yukon	



TETRA TECH EBA

Contractor: Boart Longyear	Completion Depth: 10.06 m
Drilling Rig Type: Track Mounted	Start Date: 2015 October 7
Logged By: KR	Completion Date: 2015 October 7
Reviewed By: SK	Page 1 of 1

Government of Yukon - Site Assessment & Remediation

Borehole No: **15MW02**

Project: Hydrogeological Assessment Eagle Plains SWF	Project No: ENVH2O03173-01
Location:	
Eagle Plains, Yukon	

Depth (m)	Method	Soil Description	Sample Type	Vapour readings (ppmv) 200 400 600 800	Notes and Comments	#2	Depth (ft)
0							0
0 – 1	Sonic	ORGANICS - (100 mm thick) SAND - some rounded to subrounded gravel and cobbles, fine grained sand, moist to wet, orange, oxidized			Pipe stickup = 1.00 metre		2 – 4
1 – 2		SILT - firm, dark brown, no visible ice SAND AND SILT - crumbly, dry, hard, grey					6 – 8
2 – 3		- weathered bedrock SANDSTONE - highly fractured, dry, oxidized					10 – 12
4		END OF BOREHOLE (3.96 metres) Monitoring well installed to 3.96 metres Thermistor #2 installed to 3.96 metres					14
5 – 15							16 – 48

TETRA TECH EBA

Contractor: Boart Longyear	Completion Depth: 3.96 m
Drilling Rig Type: Track Mounted	Start Date: 2015 October 7
Logged By: KR	Completion Date: 2015 October 7
Reviewed By: SK	Page 1 of 1

Government of Yukon - Site Assessment & Remediation

Borehole No: **15MW03**

Project: Hydrogeological Assessment Eagle Plains SWF	Project No: ENVH2O03173-01
Location:	
Eagle Plains, Yukon	

Depth (m)	Method	Soil Description	Sample Type	Vapour readings (ppmv) 200 400 600 800	Notes and Comments	#2552	Depth (ft)
0		ORGANICS - some sand, (100 mm thick)			Pipe stickup = 0.90 metres		0
		SAND AND GRAVEL - some silt and clay, fine to coarse grained sand, subrounded gravel, well graded, moist					
1		SAND - some gravel and cobbles, fine grained, damp to moist, dark brown					2
		SANDSTONE - dry, oxidized					
		SHALE - organic rich					4
2		SANDSTONE - highly fractured, very oxidized					6
							8
3		SHALE - organic rich, dry, black					10
							12
4							14
	Sonic						16
5							18
							20
6							22
							24
7		- light grey					26
		- highly oxidized					28
8							30
							32
9		- harder					34
							36
10		END OF BOREHOLE (10.06 metres)					38
		Monitoring well installed to 3.96 metres					40
11		Thermistor #2552 installed to 10.06 metres					42
							44
12							46
							48
13							
14							
15							

TETRA TECH EBA

Contractor: Boart Longyear	Completion Depth: 10.06 m
Drilling Rig Type: Track Mounted	Start Date: 2015 October 7
Logged By: KR	Completion Date: 2015 October 7
Reviewed By: SK	Page 1 of 1

Government of Yukon - Site Assessment & Remediation

Borehole No: **15MW04**

Project: Hydrogeological Assessment Eagle Plains SWF	Project No: ENVH2O03173-01
Location:	
Eagle Plains, Yukon	

Depth (m)	Method	Soil Description	Sample Type	Vapour readings (ppmv) 200 400 600 800	Notes and Comments	Backfill	Depth (ft)
0							0
	Sonic	ORGANICS - dark, leaves, rootlets, frozen, (150 mm thick)					
		SAND AND GRAVEL (FILL) - fine to coarse grained sand, rounded gravel, wet, some rootlets					
		ORGANICS - garbage covered, some sand and gravel, rootlets					
1		SAND - some silt and gravel, fine grained sand, damp to moist					2
		- oxidized					4
		- wet, sheen on water, strong hydrocarbon odour					
2		SILT - clayey, very dense, dark, no visible ice, unfrozen					6
		SHALE - organic rich, crumbly					8
		- more competent					
3				4500			10
				4500			12
		END OF BOREHOLE (3.70 metres)					
4		Note: Backfilled at completion.					14
5							16
6							18
							20
7							22
							24
8							26
							28
9							30
							32
10							34
							36
11							38
							40
12							42
							44
13							46
							48
14							
15							

TETRA TECH EBA

Contractor: Boart Longyear	Completion Depth: 3.7 m
Drilling Rig Type: Track Mounted	Start Date: 2015 October 7
Logged By: KR	Completion Date: 2015 October 7
Reviewed By: SK	Page 1 of 1

Government of Yukon - Site Assessment & Remediation

Borehole No: **15MW05**

Project: Hydrogeological Assessment Eagle Plains SWF	Project No: ENVH2O03173-01
Location:	
Eagle Plains, Yukon	

Depth (m)	Method	Soil Description	Sample Type	Vapour readings (ppmv) 200 400 600 800	Notes and Comments	#1	Depth (ft)
0							0
	Sonic	ORGANICS - moss and peat, rootlets, frozen, (150 mm thick)			Pipe stickup = 0.82 metres		
		SILT - some sand, wet to 0.30 metres, very hard, high plastic					
1		No recovery					2
		SILT - clayey, large gravel, trace of cobbles, very hard, oxidized, no visible ice					4
		SHALE - organic rich, very dark black					6
2		- brownish black		3500			8
		- very dense, grey		3500			
3				4521			10
				4500			12
4				4500			14
		END OF BOREHOLE (4.08 metres) Monitoring well installed to 4.08 metres Thermistor #1 installed to 4.08 metres					16
5							18
6							20
7							22
8							24
9							26
10							28
11							30
12							32
13							34
14							36
15							38
							40
							42
							44
							46
							48

TETRA TECH EBA

Contractor: Boart Longyear	Completion Depth: 4.08 m
Drilling Rig Type: Track Mounted	Start Date: 2015 October 7
Logged By: KR	Completion Date: 2015 October 7
Reviewed By: SK	Page 1 of 1

Government of Yukon - Site Assessment & Remediation

Borehole No: **15MW06**

Project: Hydrogeological Assessment Eagle Plains SWF	Project No: ENVH2O03173-01
Location:	
Eagle Plains, Yukon	

Depth (m)	Method	Soil Description	Sample Type	Vapour readings (ppmv) 200 400 600 800	Notes and Comments	#3	Depth (ft)
0							0
		ORGANICS - some sand and gravel, rootlets, frozen, (100 mm thick)		1270	Pipe stickup = 0.84 metres		
		SAND AND GRAVEL - trace of cobbles, coarse grained sand, damp to moist, orange, oxidized					
1		SANDSTONE - dry, grey, some oxidized areas		1231			2
				1513			4
	Sonic	SHALE - organic rich, black		1407			6
2		- greyish		1296			8
							10
3		- oxidized		1348			12
		- crumbly, very soft					
		- more competent, slightly grey, some oxidized					
4		- competent, hard					14
		END OF BOREHOLE (4.00 metres)					16
5		Monitoring well installed to 4.00 metres					18
		Thermistor #3 installed to 4.00 metres					20
6							22
							24
7							26
							28
8							30
							32
9							34
							36
10							38
							40
11							42
							44
12							46
							48
13							
14							
15							

TETRA TECH EBA

Contractor: Boart Longyear	Completion Depth: 4 m
Drilling Rig Type: Track Mounted	Start Date: 2015 October 8
Logged By: KR	Completion Date: 2015 October 8
Reviewed By: SK	Page 1 of 1

Government of Yukon - Site Assessment & Remediation

Borehole No: **15MW07**

Project: Hydrogeological Assessment Eagle Plains SWF	Project No: ENVH2O03173-01
Location:	
Eagle Plains, Yukon	

Depth (m)	Method	Soil Description	Sample Type	Vapour readings (ppmv) 200 400 600 800	Notes and Comments	15MW07	Depth (ft)
0							0
1	Sonic	ORGANICS - sandy, gravelly, medium grained sand, rounded to subangular gravel, rootlets, some garbage - wet SAND - some gravel and silt, trace of sandstone cobbles, fine grained, wet, firm SAND AND GRAVEL - trace of cobbles, coarse grained sand, rounded to subangular gravel, wet to saturated, hydrocarbon odour SILT - very dry, dense, firm, no visible ice END OF BOREHOLE (1.35 metres) slough - 1.20 metres Monitoring well installed to 1.20 metres			Pipe stickup = 0.81 metres		2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

TETRA TECH EBA

Contractor: Boart Longyear	Completion Depth: 1.35 m
Drilling Rig Type: Track Mounted	Start Date: 2015 October 8
Logged By: KR	Completion Date: 2015 October 8
Reviewed By: SK	Page 1 of 1

APPENDIX D

GROUNDWATER WELL DEVELOPMENT AND SAMPLING FIELD SHEETS

Groundwater Development and Sample Form

Development

WELL ID.: 15MW01 | PROJECT NO.: ENVH2003173-01

SITE: Eagle Plains Solid Waste Facility | FIELD PERSONNEL: Kristen Range

WEATHER: Sunny -5°C windy | DATE & TIME SAMPLED: Oct 8, 2015 4:30 pm

TEMPERATURE: -5°C | GPS LOCATION: N: 7357847 E: 422126 Zone: 8N (Map datum NAD83

Is well ID visible? ☐ Yes ☐ No | Is lid/j-plug in place/working? ☐ Yes ☐ No

Is well locked? ☐ Yes ☐ No | General well condition - list any damage, pooled water around well etc.:

Well Casing Inner Diameter (mm)

Depth to Water Below Top of Casing **(A)**: 4.585 (metres)

Depth to Bottom of Well Below Top of Casing **(B)**: 4.95 (metres)

Depth to Ground Below Top of Casing (stand-up): (metres)

Screen Interval (if known) (m bTOC)

4.980 − 4.585 = 0.395

2 | 0.37 | .20 | 17 | 0.185

~185 mL = 1 well vol

.185 × 6 = 1.30 L.

Have to read every 2 well volumes to ensure probe is submerged

FIELD EQUIPMENT

Field Meters Calibrated: YSI | Calibration Reference Sheet ID:

Pump:	☐ none	☐ Waterra	☐ Submersible	☐ Peristaltic	☐ Bladder
Bailer:	☐ none		☐ Stainless Steel	☐ Teflon	☐ PVC
Filter:	☐ none		☐ In-line	☐ Vacuum	☐ Other
Equipment left in well:	☐ none		☐ Bailer	☐ Waterra	☐ Other

WELL PURGING

Purge Volumes 25 = 0.5 L/m

Casing In. Diam. (mm)	~~2~~	51	78	100	150
Vol (L/m of casing)* **(C)**	0.8	2.0	4.5	7.9	17.7

*double for filter pack

SPC ORP

One well volume **((B – A(*C))**: 0.185 litres

Purge volume to aim for: 1.3 litres

or until parameters stabilize:

Pump inlet depth (m bTOC): (m bTOC)

TIME	PURGE RATE (L/min)	VOLUME REMOVED (L)	TEMP (°C)	pH (UNITS)	COND. (uS/cm)	Redox (mV)	DIS.O_2 (mg/L) or %	Water Level (m bTOC)	REMARKS (colour, odour, sheen, brittle film, silt content, etc.)
Stabilisation Criteria			+/- 0.5	+/-0.05	+/- 3%	+/- 10	+/- 10%	+/- 0.1m if low flow	Visual observations (colour, turbidity, odour etc should be stable)
4:49		~0.2	2.7	7.83	104	-42.8	20.72	/	V, murky, no smell
4:53		0.4	2.18	7.97	198	-62.3	15.8	/	"
5:01		0.7	2.08	8.05	238	-77.6	12.32	/	"
5:05		1.1	2.12	7.98	148	-75.3	14.46	/	"
5:09		1.4	2.25	7.95	138	-77.1	13.77	/	"

SAMPLING

Water Odour: ☐ No ☐ Yes (describe) | Sheen ☐ No ☐ Yes (describe)

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

Parameter	Size & # of bottles:	40 mL	50mL	120mL	250mL	500mL	1L	Filter and Size (µm)	Preservatives
	☐ Plastic ☐ Glass							☐ Yes ☐ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	

No samples taken

Samples placed on ice for transport ☐ Yes ☐ No

QA/QC Samples - ☐ Yes ☐ No | **QA/QC Type and ID -**

Other (comments, notes, observations, etc):

Groundwater Development and Sample Form

WELL ID.: 15MW01 | PROJECT NO.: ENVH2O03173-01
SITE: Eagle Plains Solid Waste Facility | FIELD PERSONNEL: Kristen Range
WEATHER: Windy, overcast | DATE & TIME SAMPLED: 10:20 Oct 10, 2015
TEMPERATURE: -10°C | GPS LOCATION: N: 7357847 E: 422126 Zone: 8N (Map datum NAD83

Is well ID visible? ☐ Yes ☐ No | Is lid/j-plug in place/working? ☐ Yes ☐ No
Is well locked? ☐ Yes ☐ No | General well condition - list any damage, pooled water around well etc.:
Well Casing Inner Diameter (mm)

Depth to Water Below Top of Casing **(A)**: 4.57 (metres)
Depth to Bottom of Well Below Top of Casing **(B)**: 4.93. (metres)
Depth to Ground Below Top of Casing (stand-up): (metres)
Screen Interval (if known) (m bTOC)

☒ PID Reading = 0.5 ppm.

FIELD EQUIPMENT
Field Meters Calibrated: Y61 | Calibration Reference Sheet ID: Calibrated this morning

Pump:	☐ none	☐ Waterra	☐ Submersible	☒ Peristaltic ☐ Bladder
Bailer:	☒ none	☐ Stainless Steel	☐ Teflon	☐ PVC
Filter:	☐ none	☒ In-line	☐ Vacuum	☐ Other
Equipment left in well:	☒ none	☐ Bailer	☐ Waterra	☐ Other

WELL PURGING Low flow
Purge Volumes

Casing In. Diam. (mm)	32	51	78	100	150
Vol (L/m of casing)* **(C)**	0.8	2.0	4.5	7.9	17.7

*double for filter pack

One well volume **((B – A(*C))**: litres
Purge volume to aim for: litres
or until parameters stabilize:
Pump inlet depth (m bTOC): (m bTOC)

TIME	PURGE RATE (L/min)	VOLUME REMOVED (L)	TEMP (°C)	pH (UNITS)	COND. (uS/cm)	Redox (mV)	DIS.O_2 (mg/L) or %	Water Level (m bTOC)	REMARKS (colour, odour, sheen, brittle film, silt content, etc.)
Stabilisation Criteria			+/- 0.5	+/-0.05	+/- 3%	+/- 10	+/- 10%	+/- 0.1m if low flow	Visual observations (colour, turbidity, odour etc should be stable)
								4.77	was murky,
10:25	~0.1	✓	-1.87	7.43	228	15.4	10.63	4.76.	cleaning up.
10:31	~0.1	~600	-1.72	7.56	152	19.7	10.46	4.77	
10:37	~0.1	1.2	-2.00	7.36	144	2.7	9.12		
	line froze b/w 10:31 + 10:37. Thawed line. Start again.								
	Started again @ 10:48								
10:49	~0.1	1.3	-0.69	7.29	118		7.92	4.68	cleaning
10:52	~0.1	1.6	-0.89	7.29	116	23.5	~~7.29~~ 9.18	4.74	
10:58	~0.1	2.2	-0.24	7.38	106	-9.1	~~9.71~~ 10.02	4.78	turned down flow slightly
11:05	~0.1	2.9	-0.49	7.31	100	-6.7	10.17	4.77	
11:~~08~~ 10:10	~0.1	3.2 / 3.4	-0.41	7.24 / 7.22	96 / 97	-2.3 / -0.1	10.35 / 10.06	4.79 / 4.79	

SAMPLING Water Odour: ☒ No ☐ Yes (describe) | Sheen ☒ No ☐ Yes (describe)
Turbidity: 2 NTU or relative scale (circle as appropriate): Clear 1 (2) 3 4 ... 8 9 10 Very Silty

Parameter	Size & # of bottles:	40 mL	50mL	120mL	250mL	500mL	1L	Filter and Size (µm)	Preservatives
	☐ Plastic ☐ Glass							☐ Yes ☐ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	
	☐ Plastic ☐ Glass	As per COC						☐ Yes ☐ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	

Samples placed on ice for transport ☐ Yes ☐ No

QA/QC Samples - ☒ Yes ☐ No | **QA/QC Type and ID -** Dup 01

Other (comments, notes, observations, etc):
Had problems w/ water freezing in line when starting the flow rate v. low. Thawed line, restarted w/ higher flow rate, then turned pump down. Initial drawdown of 20cm. Drawdown stabilized. Difficult to pump slower ~~not~~ without freezing. ~~Dry~~ Began sampling @ 11:10. After sampling, w/l @ 4.79.

Groundwater Development and Sample Form

Development

WELL ID.: 15MW07 | PROJECT NO.: ENVH2O03173-01
SITE: Eagle Plains Solid Waste Facility | FIELD PERSONNEL: Kristen Range
WEATHER: Light snow. | DATE & TIME SAMPLED: 15 ~~Sept 00~~ Oct 9, 15
TEMPERATURE: -9°C | GPS LOCATION: N: 7537933 E: 422047 Zone: 8N (Map datum NAD83

Is well ID visible? ☒ Yes ☐ No | Is lid/j-plug in place/working? ☒ Yes ☐ No
Is well locked? ☐ Yes ☒ No | General well condition - list any damage, pooled water around well etc.: good.
Well Casing Inner Diameter (mm) 25

Depth to Water Below Top of Casing **(A)**:	1.78	(metres)
Depth to Bottom of Well Below Top of Casing **(B)**:	2.12.	(metres)
Depth to Ground Below Top of Casing (stand-up):	0.92.	(metres)
Screen Interval (if known)	1.67 - 2.12.	(m bTOC)

FIELD EQUIPMENT

Field Meters Calibrated: YSI | Calibration Reference Sheet ID: Calibrated this morning.

Pump:	☐ none	☒ Waterra	☐ Submersible	☐ Peristaltic	☐ Bladder
Bailer:	☒ none	☐ Stainless Steel	☐ Teflon	☒ PVC	
Filter:	☒ none	☐ In-line	☐ Vacuum	☐ Other	
Equipment left in well:	☒ none	☐ Bailer	☐ Waterra	☐ Other	

WELL PURGING 25mm = 0.5 L/m

One well volume **((B – A(*C))**: 0.17 litres
Purge volume to aim for: ~1L litres
or until parameters stabilize:
Pump inlet depth (m bTOC): (m bTOC)

Purge Volumes

Casing In. Diam. (mm)	32	51	78	100	150
Vol (L/m of casing)* **(C)**	0.8	2.0	4.5	7.9	17.7

*double for filter pack

ORP

TIME	PURGE RATE (L/min)	VOLUME REMOVED (L)	TEMP (°C)	pH (UNITS)	COND. (uS/cm)	Redox (mV)	DIS O_2 (mg/L) or %	Water Level (m bTOC)	REMARKS (colour, odour, sheen, brittle film, silt content, etc.)
Stabilisation Criteria			+/- 0.5	+/-0.05	+/- 3%	+/- 10	+/- 10%	+/- 0.1m if low flow	Visual observations (colour, turbidity, odour etc should be stable)
10:08	✓	~200ml	-1.~~2~~	~6.01	286	-71.2	10.02	2.04	v. murky, sheen HC, HC odor
10:17		~400ml	-1.9	6.12	335	-95.3	7.25	2.08	ice crystals in walls
		Can't get more water out, will continue developing							
		in a bit.							-water very cold., strong HC smell + sheen.
12:07		~700ml	-1.5	6.30	285	38.3	12.66	~~1~~.89.	
~~12:20~~		~~[redacted]~~						1.80 @ 12:21.	- no free product
12:25		~1000ml	-1.8	6.50	191	28.4	9.42	1.8	
	Finished developing @ 12:30 pm. Installed datalogger in MW to monitor recovery / ~~rate~~ of ~~static~~ water level has ~~been~~ stabilized.								
	@ 2:49, water level = 1.73 m bTOPVC.								

SAMPLING Water Odour: ☐ No ☒ Yes (describe) ~~Hydrocarbon~~ Hydrocarbon Sheen ☐ No ☒ Yes (describe)

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

Parameter	Size & # of bottles:	40 mL	50mL	120mL	250mL	500mL	1L	Filter and Size (µm)	Preservatives
	☐ Plastic ☐ Glass							☐ Yes ☐ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	
	☐ Plastic ☐ Glass			No samples taken				☐ Yes ☐ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	

Samples placed on ice for transport ☐ Yes ☐ No

QA/QC Samples - ☐ Yes ☐ No | **QA/QC Type and ID -**

Other (comments, notes, observations, etc):

Groundwater Development and Sample Form

WELL ID.: 15MW07 | PROJECT NO.: ENVH2003173-01
SITE: Eagle Plains Solid Waste Facility | FIELD PERSONNEL: Kristen Range
WEATHER: cold., windy | DATE & TIME SAMPLED: 12:50 Oct 10, 2015
TEMPERATURE: -10 | GPS LOCATION: N: 7537933 E: 422047 Zone: 8N (Map datum NAD83

Is well ID visible? ☐ Yes ☐ No | Is lid/j-plug in place/working? ☐ Yes ☐ No
Is well locked? ☐ Yes ☐ No | General well condition - list any damage, pooled water around well etc.:
Well Casing Inner Diameter (mm)

Depth to Water Below Top of Casing **(A)**:	1.75	(metres)
Depth to Bottom of Well Below Top of Casing **(B)**:	2.12	(metres)
Depth to Ground Below Top of Casing (stand-up):	0.9	(metres)
Screen Interval (if known)		(m bTOC)

PID Reading = 190 ppm.

FIELD EQUIPMENT
Field Meters Calibrated: YSI | Calibration Reference Sheet ID: Calibrated this morning

Pump:	☐ none	☐ Waterra	☐ Submersible	☒ Peristaltic ☐ Bladder
Bailer:	☒ none	☐ Stainless Steel	☐ Teflon	☐ PVC
Filter:	☒ none	☐ In-line	☐ Vacuum	☐ Other
Equipment left in well:	☒ none	☐ Bailer	☐ Waterra	☐ Other

WELL PURGING
Purge Volumes 25 m = 0.5 L

Casing In. Diam. (mm)	32	51	78	100	150
Vol (L/m of casing)* **(C)**	0.8	2.0	4.5	7.9	17.7

*double for filter pack

One well volume **((B – A(*C))**: litres
Purge volume to aim for: litres
or until parameters stabilize:
Pump inlet depth (m bTOC): 2.10 (m bTOC)

TIME	PURGE RATE (L/min)	VOLUME REMOVED (L)	TEMP (°C)	pH (UNITS)	COND. (uS/cm)	Redox (mV)	DIS.O_2 (mg/L) or %	Water Level (m bTOC)	REMARKS (colour, odour, sheen, brittle film, silt content, etc.)
Stabilisation Criteria			+/- 0.5	+/-0.05	+/- 3%	+/- 10	+/- 10%	+/- 0.1m if low flow	Visual observations (colour, turbidity, odour etc should be stable)
12:55		~ 300ml	-2.01	6.47	116	44.3	11.77	2.12.	v. murky Hydrocarbon smell.
	Unable to do low flow sampling. Well purged dry at lowest pumping rate. Collected what as much water as possible until 3 pm. Only able to collect ~1L for a sample								
	collected 2 40ml vials for BTEX, 1.5 250ml bottles for								
	PAH/EPH, 1 500ml for all other analysis [redacted]								
	* not filtered or preserved.								

SAMPLING Water Odour: ☐ No ☒ Yes (describe) Hydrocarbon Sheen ☐ No ☒ Yes (describe) Hc sheen
Turbidity: 5 NTU or relative scale (circle as appropriate): Clear 1 2 3 [redacted] 8 9 10 Very Silty

Parameter	Size & # of bottles:	40 mL	50mL	120mL	250mL	500mL	1L	Filter and Size (µm)	Preservatives
BTEX	☐ Plastic ☒ Glass	2						☐ Yes ☒ No	BTEX
PAH/EPH	☐ Plastic ☐ Glass				1	[redacted]		☐ Yes ☒ No	Sodium bisulfate
	☑ Plastic ☐ Glass					[redacted]		☐ Yes ☒ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	
	☐ Plastic ☐ Glass							☐ Yes ☐ No	

Samples placed on ice for transport ☐ Yes ☐ No

QA/QC Samples - ☐ Yes ☒ No | **QA/QC Type and ID -**

Other (comments, notes, observations, etc):
Due to ice build up in well, unable to measure drawdown. Turned pump to lowest setting. Well went dry within 5 minutes. Line froze, will thaw and begin sampling

APPENDIX E
SURFACE WATER SAMPLING SHEETS

EBA # ~~W23101021.028~~ ENVH2003173-01

Station/Site: SW1

Date/Time: Oct 9, 2015 13:25 am ☐ pm ☐

Sampler(s): KRR

Duplicate ☐ Yes ☒ No ☐ Dup1 ☐ Dup2

Season: Winter ☐ Spring ☐ Summer ☐ Fall ☒

Weather: Rain ☐ Snow ☐ Overcast ☐ Clear ☐ Windy ☒ Temperature -9°C

	Collected	Preserved	Field Filtered
Routine (500ml)	☒	As per COC	
Total Metals (125ml)	☒	☐	
Dissolved metals (250ml)	☒	☐	☒
Nutrients (250ml)	☒	☐	

*Samples should be perserved and filtered imediately after collection unless outside temperature hinders the filtering process

Notes:

In Situ measurements

pH 4.89

SPC Conductivity 119 µS/cm

Temperature -2.00°C ORP = 286.4 mv

TDS 0.077 ~~mg~~ g/L

Dissolved O2 13.71 mg/L

Flows taken ☐ Yes ☒ No

Misc

Photo(s) taken Yes 130

GPS Co-ords 7358558 N 421851 E

Waypoint name

Comments:

EBA # ~~W23101021.028~~ ENVH2003173-01

Station/Site: SW2

Date/Time: Oct 9, 2015 4:30 am ☐ pm ☒

Sampler(s): KRR

Duplicate ☐ Yes ☒ No ☐ Dup1 ☐ Dup2

Season: Winter ☐ Spring ☐ Summer ☐ Fall ☒

Weather: Rain ☐ Snow ☐ Overcast ☐ Clear ☐ Windy ☒ Temperature -9°C

	Collected	Preserved	Field Filtered
Routine (500ml)	☒	As per COC.	
Total Metals (125ml)	☒	☒	
Dissolved metals (250ml)	☒	☒	☒
Nutrients (250ml)	☒	☒	

*Samples should be perserved and filtered imediately after collection unless outside temperature hinders the filtering process

Notes:

In Situ measurements

pH 4.60

SPC Conductivity 540 µS/cm

Temperature -2.0°C ORP = 283.3 mV

TDS 0.352 g/L

Dissolved O2 14.28 mg/L

Flows taken ☐ Yes ☒ No

Misc

Photo(s) taken 134

GPS Co-ords 7358179 N 422826 E

Waypoint name

Comments:

EBA # ~~W2310102[illegible]~~ ENV1420003173-01

Station/Site: SW3

Date/Time: 5:45 Oct 9, 2015 am ☐ pm ☒

Sampler(s): KRR

Duplicate ☐ Yes ☒ No ☐ Dup1 ☐ Dup2

Season: Winter ☐ Spring ☐ Summer ☐ Fall ☒

Weather: Rain ☐ Snow ☐ Overcast ☐ Clear ☐ Windy ☒ Temperature −9°C

	Collected	Preserved	Field Filtered
Routine (500ml)	☒		As per COC
Total Metals (125ml)	☒	☒	
Dissolved metals (250ml)	☒	☒	☒
Nutrients (250ml)	☒	☒	

*Samples should be perserved and filtered imediately after collection unless outside temperature hinders the filtering process

Notes:

In Situ measurements

pH 4.81

SPC Conductivity 113 µS/cm.

Temperature −2.0°C ORP = 311.7 mV

TDS 0.075 g/L

Dissolved O2 10.89 mg/L

Flows taken ☐ Yes ☒ No

Misc

Photo(s) taken 135 – 136

GPS Co-ords 7358844 N 421919 E

Waypoint name 502

Comments:

EBA # ~~W2310102[illegible]~~ ENV1420003173-02

Station/Site: SW4

Date/Time: Oct 10, 2015 2:30 pm am ☐ pm ☒

Sampler(s): KRR

Duplicate ☐ Yes ☒ No ☐ Dup1 ☐ Dup2

Season: Winter ☐ Spring ☐ Summer ☐ Fall ☒

Weather: Rain ☐ Snow ☐ Overcast ☐ Clear ☐ Windy ☒ Temperature −10°

	Collected	Preserved	Field Filtered
Routine (500ml)	☒	As per COC	
Total Metals (125ml)	☒	☒	
Dissolved metals (250ml)	☒	☒	☒
Nutrients (250ml)	☒	☒	

*Samples should be perserved and filtered imediately after collection unless outside temperature hinders the filtering process

Notes:

In Situ measurements

pH 3.94

SPC ~~Conductivity~~ 245 µS/cm.

Temperature −1.98°C

TDS 0.120 g/L ORP = 365.8 mV

Dissolved O2 16.69 mg/L

Flows taken ☐ Yes ☒ No

Misc

Photo(s) taken 145 – 147

GPS Co-ords 7358679 N 422266 E

Waypoint name

Comments:

APPENDIX F
LABORATORY ANALYTICAL RESULTS

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

CLIENT NAME: TETRA TECH EBA
61 WASSON PLACE
WHITEHORSE, YT Y1A0H7
(867) 668-9225

ATTENTION TO: KRISTEN RANGE

PROJECT: ENVH2O 03173-01

AGAT WORK ORDER: 15V029854

SOIL ANALYSIS REVIEWED BY: Angela Bond, Technical Reviewer

TRACE ORGANICS REVIEWED BY: Angela Bond, Technical Reviewer

ULTRA TRACE REVIEWED BY: Philippe Morneau, chimiste

WATER ANALYSIS REVIEWED BY: Angela Bond, Technical Reviewer

DATE REPORTED: Oct 15, 2015

PAGES (INCLUDING COVER): 54

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (778) 452-4000

NOTES

VERSION 1: Sample receipt temperature 5°C.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

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FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

British Columbia Metals Schedule 4 and 5

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

Parameter	Unit	G / S	RDL	15MW01 9. 8-10.0m Soil 10/7/2015 7079503	15MW07 1. 1-1.2m Soil 10/8/2015 7079504	15MW07 0. 5-0.6m Soil 10/8/2015 7079505	15MW06 0. 3-0.4m Soil 10/8/2015 7079506	15MW01 1.8-2m Soil 10/7/2015 7079507	Dup 01 9. 8-10.0m Soil 10/7/2015 7079508	15MW04 1. 1-1.2m Soil 10/7/2015 7079509	15MW04 0. 3-0.4m Soil 10/7/2015 7079510
Antimony	µg/g		0.1	0.5	0.2	0.4	0.3	0.8	0.5	0.4	0.3
Arsenic	µg/g		0.1	38.7	6.0	7.7	5.3	32.0	37.5	10.5	7.4
Barium	µg/g		0.5	380	79.0	119	44.0	244	400	114	75.1
Beryllium	µg/g		0.1	1.1	0.2	0.3	0.1	0.6	1.1	0.4	0.3
Cadmium	µg/g		0.01	0.05	0.05	0.07	0.02	0.06	0.09	0.11	0.08
Chromium	µg/g		1	32	7	16	4	24	32	11	12
Cobalt	µg/g		0.1	6.8	1.5	3.1	0.7	1.6	6.8	2.8	1.5
Copper	µg/g		0.2	53.1	4.8	9.9	3.7	31.4	70.0	10.1	5.7
Lead	µg/g		0.1	17.6	5.4	6.9	3.2	16.2	18.4	6.9	6.7
Mercury	µg/g		0.01	0.05	<0.01	0.02	<0.01	0.12	0.05	0.01	<0.01
Molybdenum	µg/g		0.2	0.7	0.3	0.6	0.3	0.9	0.7	0.6	0.7
Nickel	µg/g		0.5	42.6	5.8	11.1	3.3	15.7	40.9	13.0	5.7
Selenium	µg/g		0.1	1.3	0.4	0.5	0.2	2.6	1.7	0.7	0.3
Silver	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium	µg/g		0.1	0.2	<0.1	<0.1	<0.1	0.2	0.2	<0.1	<0.1
Tin	µg/g		0.2	0.8	<0.2	0.3	<0.2	0.6	0.8	0.2	0.3
Uranium	µg/g		0.2	1.2	0.3	0.5	0.2	1.0	1.3	0.5	0.4
Vanadium	µg/g		1	82	16	32	11	62	82	29	34
Zinc	µg/g		1	87	18	34	12	39	89	53	20
pH 1:2	pH units		0.1	4.4	5.3	4.9	5.4	4.6	4.3	5.3	4.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7079503-7079510 Results are based on the dry weight of the sample

Certified By: Angela Bond

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH / LEPH / HEPH / EPH Water

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		SW1	SW2	SW3	SW4
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		10/9/2015	10/9/2015	10/9/2015	10/10/2015
Parameter	Unit	G / S	RDL	7080701	7080702	7080703	7080704
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1	<1	<1
Benzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
o-Xylene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Styrene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
VPH	µg/L		100	<100	<100	<100	<100
VH	µg/L		100	<100	<100	<100	<100
Naphthalene	µg/L		0.05	0.05	<0.05	<0.05	<0.05
Quinoline	µg/L		0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Acridine	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	µg/L		0.02	<0.02	<0.02	<0.02	0.06
Benzo(a)anthracene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Benzo(j)fluoranthene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Dibenzo(a,h)anthracene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/L		0.05	<0.05	<0.05	<0.05	<0.05
LEPH C10-C19	µg/L		100	<100	<100	<100	<100
HEPH C19-C32	µg/L		100	<100	<100	<100	<100

Certified By: Angela Bond

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH / LEPH / HEPH / EPH Water

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		SW1	SW2	SW3	SW4
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		10/9/2015	10/9/2015	10/9/2015	10/10/2015
Parameter	**Unit**	**G / S**	**RDL**	**7080701**	**7080702**	**7080703**	**7080704**
EPH C10-C19	µg/L		100	<100	<100	<100	<100
EPH C19-C32	µg/L		100	<100	<100	<100	<100
Benzo(b+j)fluoranthene	µg/L		0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	ug/L		1	<1	<1	<1	<1
Surrogate	**Unit**	**Acceptable Limits**					
Naphthalene - d8	%	50-130		68	66	72	66
2-Fluorobiphenyl	%	50-130		73	71	76	70
P-Terphenyl - d14	%	60-130		90	84	88	87
Bromofluorobenzene	%	70-130		97	97	95	98
Dibromofluoromethane	%	70-130		103	108	105	108
Toluene - d8	%	70-130		96	95	94	95

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7080701-7080704 VPH results have been corrected for BTEX contributions.
LEPH & HEPH results have been corrected for PAH contributions.

Certified By: Angela Bond

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AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

LEPH/HEPH Soil

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		15MW01 9. 8-10.0m		15MW07 1. 1-1.2m		15MW07 0. 5-0.6m	15MW06 0. 3-0.4m	15MW01 1.8-2m	Dup 01 9. 8-10.0m
		SAMPLE TYPE:		Soil		Soil		Soil	Soil	Soil	Soil
		DATE SAMPLED:		10/7/2015		10/8/2015		10/8/2015	10/8/2015	10/7/2015	10/7/2015
Parameter	**Unit**	**G / S**	**RDL**	**7079503**	**RDL**	**7079504**	**RDL**	**7079505**	**7079506**	**7079507**	**7079508**
Naphthalene	µg/g		0.01	<0.01	0.1	8.8	0.01	0.02	<0.01	<0.01	<0.01
2-Methylnaphthalene	µg/g		0.01	0.04	0.1	18.5	0.01	0.07	<0.01	<0.01	0.05
1-Methylnaphthalene	µg/g		0.01	0.05	0.1	11.7	0.01	0.06	<0.01	<0.01	0.06
Acenaphthylene	µg/g		0.01	<0.01	0.1	<0.1	0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g		0.01	<0.01	0.1	<0.1	0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	µg/g		0.02	<0.02	0.2	0.3	0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	µg/g		0.02	0.13	0.02	0.23	0.02	<0.02	<0.02	0.06	0.15
Anthracene	µg/g		0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
Fluoranthene	µg/g		0.05	0.08	0.05	<0.05	0.05	<0.05	<0.05	0.07	0.09
Pyrene	µg/g		0.02	0.15	0.02	<0.02	0.02	<0.02	<0.02	0.09	0.16
Benzo(a)anthracene	µg/g		0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
Chrysene	µg/g		0.05	0.08	0.05	<0.05	0.05	<0.05	<0.05	0.11	0.08
Benzo(b)fluoranthene	µg/g		0.02	0.09	0.02	<0.02	0.02	<0.02	<0.02	0.12	0.12
Benzo(j)fluoranthene	µg/g		0.02	0.02	0.02	<0.02	0.02	<0.02	<0.02	0.02	0.02
Benzo(k)fluoranthene	µg/g		0.02	0.02	0.02	<0.02	0.02	<0.02	<0.02	0.02	0.02
Benzo(a)pyrene	µg/g		0.05	0.06	0.05	<0.05	0.05	<0.05	<0.05	<0.05	0.08
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	0.04	0.02	<0.02	0.02	<0.02	<0.02	0.04	0.06
Dibenzo(a,h)anthracene	µg/g		0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
Benzo(g,h,i)perylene	µg/g		0.05	0.70	0.05	<0.05	0.05	<0.05	<0.05	0.23	0.89
LEPH C10-C19	µg/g		20	62	20	2830	20	28	<20	23	63
HEPH C19-C32	µg/g		20	111	20	63	20	28	<20	78	111
Benzo(b+j)fluoranthene	µg/g		0.03	0.11	0.03	<0.03	0.03	<0.03	<0.03	0.14	0.14
Surrogate	**Unit**	**Acceptable Limits**									
Naphthalene - d8	%	50-130		71		108		67	85	74	75
2-Fluorobiphenyl	%	50-130		78		107		71	86	87	76
P-Terphenyl - d14	%	60-130		80		80		70	83	78	88

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

LEPH/HEPH Soil

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		15MW04 1. 1-1.2m		15MW04 0. 3-0.4m
		SAMPLE TYPE:		Soil		Soil
		DATE SAMPLED:		10/7/2015		10/7/2015
Parameter	**Unit**	**G / S**	**RDL**	**7079509**	**RDL**	**7079510**
Naphthalene	µg/g		0.1	7.3	0.01	0.01
2-Methylnaphthalene	µg/g		0.1	17.2	0.01	0.05
1-Methylnaphthalene	µg/g		0.1	12.5	0.01	0.04
Acenaphthylene	µg/g		0.1	<0.1	0.01	<0.01
Acenaphthene	µg/g		0.1	<0.1	0.01	<0.01
Fluorene	µg/g		0.2	0.5	0.02	<0.02
Phenanthrene	µg/g		0.02	0.56	0.02	<0.02
Anthracene	µg/g		0.02	<0.02	0.02	<0.02
Fluoranthene	µg/g		0.05	<0.05	0.05	<0.05
Pyrene	µg/g		0.02	0.02	0.02	<0.02
Benzo(a)anthracene	µg/g		0.02	<0.02	0.02	<0.02
Chrysene	µg/g		0.05	<0.05	0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.02	<0.02	0.02	<0.02
Benzo(j)fluoranthene	µg/g		0.02	<0.02	0.02	<0.02
Benzo(k)fluoranthene	µg/g		0.02	<0.02	0.02	<0.02
Benzo(a)pyrene	µg/g		0.05	<0.05	0.05	<0.05
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	0.02	<0.02
Dibenzo(a,h)anthracene	µg/g		0.02	<0.02	0.02	<0.02
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	0.05	<0.05
LEPH C10-C19	µg/g		20	2830	20	29
HEPH C19-C32	µg/g		20	178	20	65
Benzo(b+j)fluoranthene	µg/g		0.03	<0.03	0.03	<0.03
Surrogate	**Unit**	**Acceptable Limits**				
Naphthalene - d8	%	50-130		94		66
2-Fluorobiphenyl	%	50-130		95		71
P-Terphenyl - d14	%	60-130		82		74

Certified By: Angela Bond

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

LEPH/HEPH Soil

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7079503	Results are based on dry weight of sample. LEPH & HEPH results have been corrected for PAH contributions.
7079504	Results are based on dry weight of sample. LEPH & HEPH results have been corrected for PAH contributions. PAH detection limits increased due to sample matrix interference.
7079505-7079508	Results are based on dry weight of sample. LEPH & HEPH results have been corrected for PAH contributions.
7079509	Results are based on dry weight of sample. LEPH & HEPH results have been corrected for PAH contributions. PAH detection limits increased due to sample matrix interference.
7079510	Results are based on dry weight of sample. LEPH & HEPH results have been corrected for PAH contributions.

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

LEPH/HEPH/EPH Water

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

SAMPLE DESCRIPTION:				15MW01	Dup 01		15MW07		Trip Blank
SAMPLE TYPE:				Water	Water		Water		Water
DATE SAMPLED:				10/10/2015	10/10/2015		10/10/2015		9/29/2015
Parameter	**Unit**	**G / S**	**RDL**	**7080691**	**7080695**	**RDL**	**7080699**	**RDL**	**7080705**
Naphthalene	µg/L		0.05	<0.05	<0.05	5	589	0.05	<0.05
Quinoline	µg/L		0.1	<0.1	<0.1	10	<10	0.1	<0.1
Acenaphthylene	µg/L		0.05	<0.05	<0.05	5	<5	0.05	<0.05
Acenaphthene	µg/L		0.05	<0.05	<0.05	5	<5	0.05	<0.05
Fluorene	µg/L		0.05	<0.05	<0.05	5	13	0.05	<0.05
Phenanthrene	µg/L		0.05	<0.05	<0.05	0.05	8.26	0.05	<0.05
Anthracene (Water)	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Acridine	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Fluoranthene	µg/L		0.05	<0.05	<0.05	0.05	0.20	0.05	<0.05
Pyrene	µg/L		0.02	0.02	<0.02	0.02	0.33	0.02	<0.02
Benzo(a)anthracene	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Chrysene	µg/L		0.05	<0.05	<0.05	0.05	0.09	0.05	<0.05
Benzo(b)fluoranthene	µg/L		0.05	<0.05	<0.05	0.05	0.13	0.05	<0.05
Benzo(j)fluoranthene	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Benzo(k)fluoranthene	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Benzo(a)pyrene	µg/L		0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Dibenzo(a,h)anthracene	µg/L		0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.05
Benzo(g,h,i)perylene	µg/L		0.05	<0.05	<0.05	0.05	0.15	0.05	<0.05
LEPH C10-C19	µg/L		100	<100	<100	1000	117000	100	<100
HEPH C19-C32	µg/L		100	<100	<100	1000	3960	100	<100
EPH C10-C19	µg/L		100	<100	<100	1000	118000	100	<100
EPH C19-C32	µg/L		100	<100	<100	1000	4000	100	<100
Benzo(b+j)fluoranthene	µg/L		0.1	<0.1	<0.1	0.1	0.1	0.1	<0.1
Surrogate	**Unit**	**Acceptable Limits**							
Naphthalene - d8	%	50-130		74	73		NA		76
2-Fluorobiphenyl	%	50-130		76	75		106		75
P-Terphenyl - d14	%	60-130		86	84		83		92

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

LEPH/HEPH/EPH Water

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7080691-7080695 LEPH & HEPH results have been corrected for PAH contributions.

7080699 LEPH & HEPH results have been corrected for PAH contributions.
Naphthalene-d8 surrogate is not available due to sample matrix interference. PAH & EPH detection limits increased. Sample extract was diluted.

7080705 LEPH & HEPH results have been corrected for PAH contributions.

Certified By: Angela Bond

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AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

SAMPLE DESCRIPTION:				15MW01 9. 8-10.0m	15MW07 1. 1-1.2m	15MW07 0. 5-0.6m	15MW06 0. 3-0.4m	15MW01 1.8-2m	Dup 01 9. 8-10.0m	15MW04 1. 1-1.2m	15MW04 0. 3-0.4m
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				10/7/2015	10/8/2015	10/8/2015	10/8/2015	10/7/2015	10/7/2015	10/7/2015	10/7/2015
Parameter	Unit	G / S	RDL	7079503	7079504	7079505	7079506	7079507	7079508	7079509	7079510
Chloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acetone	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-butyl ether (MTBE)	µg/g		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Butanone (MEK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	µg/g		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzene	µg/g		0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	1.02	0.37
1,2-Dichloropropane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	µg/g		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromodichloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-Methyl-2-pentanone (MIBK)	µg/g		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	µg/g		0.05	<0.05	6.47	0.07	<0.05	<0.05	<0.05	5.31	1.16
Dibromochloromethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene Dibromide	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		15MW01 9. 8-10.0m	15MW07 1. 1-1.2m	15MW07 0. 5-0.6m	15MW06 0. 3-0.4m	15MW01 1.8-2m	Dup 01 9. 8-10.0m	15MW04 1. 1-1.2m	15MW04 0. 3-0.4m
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		10/7/2015	10/8/2015	10/8/2015	10/8/2015	10/7/2015	10/7/2015	10/7/2015	10/7/2015
Parameter	**Unit**	**G / S**	**RDL**	7079503	7079504	7079505	7079506	7079507	7079508	7079509	7079510
1,1,1,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	µg/g		0.05	<0.05	4.19	<0.05	<0.05	<0.05	<0.05	2.18	0.12
m&p-Xylene	µg/g		0.05	<0.05	24.5	0.08	<0.05	<0.05	<0.05	24.4	0.97
Bromoform	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	µg/g		0.05	<0.05	0.37	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	µg/g		0.05	<0.05	10.7	0.07	<0.05	<0.05	<0.05	9.53	1.18
1,3-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
VPH	µg/g		10	<10	411	<10	<10	<10	<10	972	54
Total Xylenes	µg/g		0.2	<0.2	35.2	<0.2	<0.2	<0.2	<0.2	33.9	2.2
Surrogate	**Unit**	**Acceptable Limits**									
Bromofluorobenzene	%	60-140		92	109	95	97	92	101	111	136
Dibromofluoromethane	%	60-140		97	97	91	95	96	98	103	136
Toluene - d8	%	60-140		98	108	95	94	102	106	118	137

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7079503-7079510 Results are based on dry weight of sample.

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

SAMPLE DESCRIPTION:				15MW01	Dup 01	15MW07	Trip Blank
SAMPLE TYPE:				Water	Water	Water	Water
DATE SAMPLED:				10/10/2015	10/10/2015	10/10/2015	9/29/2015
Parameter	Unit	G / S	RDL	7080691	7080695	7080699	7080705
Chloromethane	µg/L		1	<1	<1	<1	<1
Vinyl Chloride	µg/L		1	<1	<1	<1	<1
Bromomethane	µg/L		1	<1	<1	<1	<1
Chloroethane	µg/L		1	<1	<1	<1	<1
Trichlorofluoromethane	µg/L		1	<1	<1	<1	<1
Acetone	µg/L		10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L		1	<1	<1	<1	<1
Dichloromethane	µg/L		1	<1	<1	<1	<1
Methyl tert-butyl ether (MTBE)	µg/L		1	<1	<1	<1	<1
2-Butanone (MEK)	µg/L		10	<10	<10	<10	<10
trans-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L		1	<1	<1	<1	<1
cis-1,2-Dichloroethylene	µg/L		1	<1	<1	<1	<1
Chloroform	µg/L		1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L		1	<1	<1	<1	<1
1,1,1-Trichloroethane	µg/L		1	<1	<1	<1	<1
Carbon Tetrachloride	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Benzene	µg/L		0.5	<0.5	<0.5	179	<0.5
1,2-Dichloropropane	µg/L		1	<1	<1	<1	<1
Trichloroethene	µg/L		1	<1	<1	<1	<1
Bromodichloromethane	µg/L		1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1
4-Methyl-2-pentanone (MIBK)	µg/L		10	<10	<10	<10	<10
cis-1,3-Dichloropropene	µg/L		1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L		1	<1	<1	<1	<1
Toluene	µg/L		0.5	<0.5	<0.5	2380	<0.5
Dibromochloromethane	µg/L		1	<1	<1	<1	<1
Ethylene Dibromide	µg/L		0.3	<0.3	<0.3	<0.3	<0.3
Tetrachloroethene	µg/L		1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Water

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		15MW01	Dup 01	15MW07	Trip Blank
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		10/10/2015	10/10/2015	10/10/2015	9/29/2015
Parameter	**Unit**	**G / S**	**RDL**	**7080691**	**7080695**	**7080699**	**7080705**
Chlorobenzene	µg/L		1	<1	<1	<1	<1
Ethylbenzene	µg/L		0.5	<0.5	<0.5	278	<0.5
m&p-Xylene	µg/L		0.5	<0.5	<0.5	1560	<0.5
Bromoform	µg/L		1	<1	<1	<1	<1
Styrene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	µg/L		1	<1	<1	<1	<1
o-Xylene	µg/L		0.5	<0.5	<0.5	833	<0.5
1,3-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	µg/L		1	<1	<1	<1	<1
VPH	µg/L		100	<100	<100	2480	<100
Total Trihalomethanes	µg/L		2	<2	<2	<2	<2
Total Xylenes	µg/L		1	<1	<1	2390	<1
Surrogate	**Unit**	**Acceptable Limits**					
Bromofluorobenzene	%	70-130		83	71	91	87
Dibromofluoromethane	%	70-130		112	99	94	82
Toluene - d8	%	70-130		110	94	108	84

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Dioxins & Furans (Soil, NATO 1988)

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		15MW01 9. 8-10.0m		15MW07 1. 1-1.2m		15MW07 0. 5-0.6m		15MW06 0. 3-0.4m
		SAMPLE TYPE:		Soil		Soil		Soil		Soil
		DATE SAMPLED:		10/7/2015		10/8/2015		10/8/2015		10/8/2015
Parameter	Unit	G / S	RDL	7079503	RDL	7079504	RDL	7079505	RDL	7079506
2,3,7,8-Tetra CDD	ng/kg		0.8	<0.8	1	<1	0.6	<0.6	0.9	<0.9
1,2,3,7,8-Penta CDD	ng/kg		0.9	<0.9	1	<1	1	2	0.9	1.2
1,2,3,4,7,8-Hexa CDD	ng/kg		0.7	0.8	1	<1	0.5	2.0	0.8	0.9
1,2,3,6,7,8-Hexa CDD	ng/kg		0.6	0.7	1	<1	0.5	1.7	0.8	1.1
1,2,3,7,8,9-Hexa CDD	ng/kg		0.7	<0.7	1	<1	0.8	<0.8	0.8	1.0
1,2,3,4,6,7,8-Hepta CDD	ng/kg		0.5	<0.5	2	2	0.8	<0.8	1	1
Octa CDD	ng/kg		0.5	1.5	3	4	2	3	2	10
2,3,7,8-Tetra CDF	ng/kg		0.6	<0.6	0.8	<0.8	0.6	<0.6	0.6	0.7
1,2,3,7,8-Penta CDF	ng/kg		0.6	<0.6	0.9	<0.9	0.6	0.9	0.7	0.8
2,3,4,7,8-Penta CDF	ng/kg		0.5	0.6	0.8	<0.8	0.5	0.5	0.5	0.9
1,2,3,4,7,8-Hexa CDF	ng/kg		0.8	<0.8	0.5	0.6	1	<1	0.7	1.4
1,2,3,6,7,8-Hexa CDF	ng/kg		0.7	<0.7	0.9	<0.9	1	<1	0.7	0.9
2,3,4,6,7,8-Hexa CDF	ng/kg		0.7	<0.7	0.9	<0.9	1	<1	0.6	1.4
1,2,3,7,8,9-Hexa CDF	ng/kg		1	<1	1	1	2	<2	0.5	1.0
1,2,3,4,6,7,8-Hepta CDF	ng/kg		0.9	<0.9	1	<1	2	<2	0.7	1.6
1,2,3,4,7,8,9-Hepta CDF	ng/kg		1	<1	1	<1	3	<3	1	1
Octa CDF	ng/kg		3	<3	4	<4	3	<3	2	3
Total Tetrachlorodibenzodioxins	ng/kg		0.8	<0.8	1	<1	0.6	<0.6	0.9	<0.9
Total Pentachlorodibenzodioxins	ng/kg		0.9	<0.9	1	<1	1	2	0.9	1.2
Total Hexachlorodibenzodioxins	ng/kg		0.7	1.5	1	<1	0.5	3.7	0.8	3.1
Total Heptachlorodibenzodioxins	ng/kg		0.5	<0.5	2	2	0.8	<0.8	1	1
Total PCDDs	ng/kg		0.9	3.0	3	7	2	8	2	16
Total Tetrachlorodibenzofurans	ng/kg		0.6	<0.6	0.8	<0.8	0.6	0.9	0.6	1.3
Total Pentachlorodibenzofurans	ng/kg		0.6	<0.6	0.9	<0.9	0.6	2.1	0.7	1.7
Total Hexachlorodibenzofurans	ng/kg		1	<1	1	2	2	<2	0.7	4.7
Total Heptachlorodibenzofurans	ng/kg		1	<1	1	<1	3	<3	1	1
Total PCDFs	ng/kg		3	<3	4	<4	3	3	2	12
2,3,7,8-Tetra CDD (TEF 1.0)	TEQ			0		0		0		0
1,2,3,7,8-Penta CDD (TEF 0.5)	TEQ			0		0		0.861		0.589

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Dioxins & Furans (Soil, NATO 1988)

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		15MW01 9. 8-10.0m		15MW07 1. 1-1.2m		15MW07 0. 5-0.6m		15MW06 0. 3-0.4m
		SAMPLE TYPE:		Soil		Soil		Soil		Soil
		DATE SAMPLED:		10/7/2015		10/8/2015		10/8/2015		10/8/2015
Parameter	Unit	G / S	RDL	7079503	RDL	7079504	RDL	7079505	RDL	7079506
1,2,3,4,7,8-Hexa CDD (TEF 0.1)	TEQ			0.0770		0		0.203		0.0914
1,2,3,6,7,8-Hexa CDD (TEF 0.1)	TEQ			0.0720		0		0.167		0.114
1,2,3,7,8,9-Hexa CDD (TEF 0.1)	TEQ			0		0		0		0.103
1,2,3,4,6,7,8-Hepta CDD (TEF 0.01)	TEQ			0		0.0224		0		0.0131
Octa CDD (TEF 0.001)	TEQ			0.00151		0.00395		0.00270		0.00979
2,3,7,8-Tetra CDF (TEF 0.1)	TEQ			0		0		0		0.0731
1,2,3,7,8-Penta CDF (TEF 0.05)	TEQ			0		0		0.0446		0.0408
2,3,4,7,8-Penta CDF (TEF 0.5)	TEQ			0.282		0		0.256		0.444
1,2,3,4,7,8-Hexa CDF (TEF 0.1)	TEQ			0		0.0617		0		0.138
1,2,3,6,7,8-Hexa CDF (TEF 0.1)	TEQ			0		0		0		0.0914
2,3,4,6,7,8-Hexa CDF (TEF 0.1)	TEQ			0		0		0		0.137
1,2,3,7,8,9-Hexa CDF (TEF 0.1)	TEQ			0		0.113		0		0.0985
1,2,3,4,6,7,8-Hepta CDF (TEF 0.01)	TEQ			0		0		0		0.0161
1,2,3,4,7,8,9-Hepta CDF (TEF 0.01)	TEQ			0		0		0		0.0133
Octa CDF (TEF 0.001)	TEQ			0		0		0		0.00313
Total PCDDs and PCDFs (TEQ)	TEQ			0.433		0.201		1.53		1.97

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Dioxins & Furans (Soil, NATO 1988)

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:	15MW01 9. 8-10.0m	15MW07 1. 1-1.2m	15MW07 0. 5-0.6m	15MW06 0. 3-0.4m
		SAMPLE TYPE:	Soil	Soil	Soil	Soil
		DATE SAMPLED:	10/7/2015	10/8/2015	10/8/2015	10/8/2015
Surrogate	Unit	Acceptable Limits	7079503	7079504	7079505	7079506
13C-2378-TCDF	%	30-140	70	69	44	64
13C-12378-PeCDF	%	30-140	73	71	48	58
13C-23478-PeCDF	%	30-140	81	81	50	69
13C-123478-HxCDF	%	30-140	50	58	49	49
13C-123678-HxCDF	%	30-140	49	56	50	44
13C-234678-HxCDF	%	30-140	63	64	51	56
13C-123789-HxCDF	%	30-140	68	69	51	53
13C-1234678-HpCDF	%	30-140	49	52	43	41
13C-1234789-HpCDF	%	30-140	71	72	56	53
13C-2378-TCDD	%	30-140	78	78	51	71
13C-12378-PeCDD	%	30-140	88	89	62	76
13C-123478-HxCDD	%	30-140	70	73	57	65
13C-123678-HxCDD	%	30-140	67	70	57	54
13C-1234678-HpCDD	%	30-140	67	71	58	65
13C-OCDD	%	30-140	61	60	47	57

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AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Dioxins & Furans (Soil, NATO 1988)

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

SAMPLE DESCRIPTION:				15MW01 1.8-2m		Dup 01 9. 8-10.0m		15MW04 1. 1-1.2m		15MW04 0. 3-0.4m
SAMPLE TYPE:				Soil		Soil		Soil		Soil
DATE SAMPLED:				10/7/2015		10/7/2015		10/7/2015		10/7/2015
Parameter	Unit	G / S	RDL	7079507	RDL	7079508	RDL	7079509	RDL	7079510
2,3,7,8-Tetra CDD	ng/kg		0.5	<0.5	1	<1	1	<1	1	<1
1,2,3,7,8-Penta CDD	ng/kg		0.9	<0.9	1	<1	1	<1	0.9	1.3
1,2,3,4,7,8-Hexa CDD	ng/kg		0.7	0.7	0.7	0.9	1	<1	1	1
1,2,3,6,7,8-Hexa CDD	ng/kg		0.7	<0.7	0.8	0.9	1	<1	1	1
1,2,3,7,8,9-Hexa CDD	ng/kg		1	<1	1	<1	1	<1	0.9	<0.9
1,2,3,4,6,7,8-Hepta CDD	ng/kg		0.9	1.1	1	<1	1	2	0.7	<0.7
Octa CDD	ng/kg		5	<5	1	2	1	4	0.9	<0.9
2,3,7,8-Tetra CDF	ng/kg		0.7	<0.7	1	<1	0.5	<0.5	1	<1
1,2,3,7,8-Penta CDF	ng/kg		1	<1	1	<1	1	1	1	<1
2,3,4,7,8-Penta CDF	ng/kg		1	<1	0.6	0.7	0.8	1	1	1
1,2,3,4,7,8-Hexa CDF	ng/kg		0.5	0.6	1	<1	1	1	1	<1
1,2,3,6,7,8-Hexa CDF	ng/kg		0.5	0.6	1	<1	1	1	1	<1
2,3,4,6,7,8-Hexa CDF	ng/kg		1	<1	1	<1	1	<1	0.9	<0.9
1,2,3,7,8,9-Hexa CDF	ng/kg		1	1	1	<1	1	<1	1	<1
1,2,3,4,6,7,8-Hepta CDF	ng/kg		2	<2	1	<1	1	<1	1	<1
1,2,3,4,7,8,9-Hepta CDF	ng/kg		2	<2	1	<1	2	<2	1	<1
Octa CDF	ng/kg		4	4	3	<3	2	<2	5	5
Total Tetrachlorodibenzodioxins	ng/kg		0.5	<0.5	1	<1	1	<1	1	3
Total Pentachlorodibenzodioxins	ng/kg		0.9	<0.9	1	<1	1	<1	0.9	2
Total Hexachlorodibenzodioxins	ng/kg		0.7	1.6	0.8	1.7	1	<1	1	3
Total Heptachlorodibenzodioxins	ng/kg		0.9	1.1	1	2	1	2	0.7	<0.7
Total PCDDs	ng/kg		5	<5	1	5	1	6	1	8
Total Tetrachlorodibenzofurans	ng/kg		0.7	0.9	1	<1	0.5	0.8	1	<1
Total Pentachlorodibenzofurans	ng/kg		1	<1	1	<1	1	4	1	3
Total Hexachlorodibenzofurans	ng/kg		1	4	1	<1	1	3	1	<1
Total Heptachlorodibenzofurans	ng/kg		2	<2	1	<1	2	<2	1	<1
Total PCDFs	ng/kg		4	9	3	<3	2	8	5	9
2,3,7,8-Tetra CDD (TEF 1.0)	TEQ			0		0		0		0
1,2,3,7,8-Penta CDD (TEF 0.5)	TEQ			0		0		0		0.656

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Dioxins & Furans (Soil, NATO 1988)

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

SAMPLE DESCRIPTION:				15MW01 1.8-2m		Dup 01 9.8-10.0m		15MW04 1.1-1.2m		15MW04 0.3-0.4m
SAMPLE TYPE:				Soil		Soil		Soil		Soil
DATE SAMPLED:				10/7/2015		10/7/2015		10/7/2015		10/7/2015
Parameter	Unit	G / S	RDL	7079507	RDL	7079508	RDL	7079509	RDL	7079510
1,2,3,4,7,8-Hexa CDD (TEF 0.1)	TEQ			0.0720		0.0866		0		0.114
1,2,3,6,7,8-Hexa CDD (TEF 0.1)	TEQ			0		0.0879		0		0.136
1,2,3,7,8,9-Hexa CDD (TEF 0.1)	TEQ			0		0		0		0
1,2,3,4,6,7,8-Hepta CDD (TEF 0.01)	TEQ			0.0108		0		0.0203		0
Octa CDD (TEF 0.001)	TEQ			0		0.00169		0.00368		0
2,3,7,8-Tetra CDF (TEF 0.1)	TEQ			0		0		0		0
1,2,3,7,8-Penta CDF (TEF 0.05)	TEQ			0		0		0.0587		0
2,3,4,7,8-Penta CDF (TEF 0.5)	TEQ			0		0.338		0.701		0.551
1,2,3,4,7,8-Hexa CDF (TEF 0.1)	TEQ			0.0583		0		0.141		0
1,2,3,6,7,8-Hexa CDF (TEF 0.1)	TEQ			0.0587		0		0.110		0
2,3,4,6,7,8-Hexa CDF (TEF 0.1)	TEQ			0		0		0		0
1,2,3,7,8,9-Hexa CDF (TEF 0.1)	TEQ			0.115		0		0		0
1,2,3,4,6,7,8-Hepta CDF (TEF 0.01)	TEQ			0		0		0		0
1,2,3,4,7,8,9-Hepta CDF (TEF 0.01)	TEQ			0		0		0		0
Octa CDF (TEF 0.001)	TEQ			0.00407		0		0		0000539
Total PCDDs and PCDFs (TEQ)	TEQ			0.319		0.514		1.03		1.46

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Dioxins & Furans (Soil, NATO 1988)

DATE RECEIVED: 2015-10-13 **DATE REPORTED: 2015-10-15**

		SAMPLE DESCRIPTION:	15MW01 1.8-2m	Dup 01 9. 8-10.0m	15MW04 1. 1-1.2m	15MW04 0. 3-0.4m
		SAMPLE TYPE:	Soil	Soil	Soil	Soil
		DATE SAMPLED:	10/7/2015	10/7/2015	10/7/2015	10/7/2015
Surrogate	Unit	Acceptable Limits	7079507	7079508	7079509	7079510
13C-2378-TCDF	%	30-140	57	66	57	67
13C-12378-PeCDF	%	30-140	59	69	57	69
13C-23478-PeCDF	%	30-140	70	77	65	76
13C-123478-HxCDF	%	30-140	46	49	50	51
13C-123678-HxCDF	%	30-140	45	46	49	50
13C-234678-HxCDF	%	30-140	56	58	54	67
13C-123789-HxCDF	%	30-140	57	60	57	64
13C-1234678-HpCDF	%	30-140	40	48	42	46
13C-1234789-HpCDF	%	30-140	56	64	60	54
13C-2378-TCDD	%	30-140	67	74	67	75
13C-12378-PeCDD	%	30-140	78	85	68	85
13C-123478-HxCDD	%	30-140	59	59	63	73
13C-123678-HxCDD	%	30-140	60	64	61	68
13C-1234678-HpCDD	%	30-140	57	66	64	60
13C-OCDD	%	30-140	45	59	49	47

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7079503-7079510 The results were corrected based on the surrogate percent recoveries.

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Ammonia, Nitrogen - Total Kjeldahl in Water

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		15MW01	Dup 01	15MW07	SW1	SW2	SW3	SW4	Trip Blank
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		10/10/2015	10/10/2015	10/10/2015	10/9/2015	10/9/2015	10/9/2015	10/10/2015	9/29/2015
Parameter	**Unit**	**G / S**	**RDL**	**7080691**	**7080695**	**7080699**	**7080701**	**7080702**	**7080703**	**7080704**	**7080705**
Ammonia-N	mg/L		0.01	0.02	0.02	<0.01	0.02	0.05	0.03	0.04	0.01
Nitrogen - Total Kjeldahl (TKN)	mg/L		0.1	0.4	0.4	1.8	0.6	0.6	0.6	0.5	0.3

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Angela Bond

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Biochemical Oxygen Demand

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		SW1	SW2	SW3	SW4	Trip Blank
		SAMPLE TYPE:		Water	Water	Water	Water	Water
		DATE SAMPLED:		10/9/2015	10/9/2015	10/9/2015	10/10/2015	9/29/2015
Parameter	Unit	G / S	RDL	7080701	7080702	7080703	7080704	7080705
BOD (5 day)	mg/L		4	<4	<4	<4	<4	<4

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7080701-7080703 Literature holding time exceeded for Biochemical Oxygen Demand analysis.

7080705 Literature holding time exceeded for Biochemical Oxygen Demand analysis.

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

British Columbia CSR - Schedule 6 Total Metals

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

SAMPLE DESCRIPTION:				SW1		SW2		SW3	SW4	Trip Blank
SAMPLE TYPE:				Water		Water		Water	Water	Water
DATE SAMPLED:				10/9/2015		10/9/2015		10/9/2015	10/10/2015	9/29/2015
Parameter	Unit	G / S	RDL	7080701	RDL	7080702	RDL	7080703	7080704	7080705
Aluminum Total	µg/L		5	1780	50	10100	5	899	1770	<5
Antimony Total	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5
Arsenic Total	µg/L		0.1	0.5	0.1	0.6	0.1	0.2	0.3	<0.1
Barium Total	µg/L		0.5	56.1	0.5	39.6	0.5	114	238	<0.5
Beryllium Total	µg/L		0.05	0.34	0.05	1.96	0.05	0.34	0.47	<0.05
Boron Total	µg/L		5	12	5	27	5	21	8	<5
Cadmium Total	µg/L		0.01	0.16	0.01	1.50	0.01	0.20	0.76	<0.01
Calcium Total	µg/L		50	5570	50	60100	50	9760	22700	<50
Chromium Total	µg/L		0.5	1.4	0.5	1.7	0.5	0.7	1.0	<0.5
Cobalt Total	µg/L		0.05	16.5	0.05	92.9	0.05	14.2	17.3	<0.05
Copper Total	µg/L		0.5	2.2	0.5	6.8	0.5	1.9	3.1	<0.5
Iron Total	µg/L		10	1160	10	1590	10	559	901	<10
Lead Total	µg/L		0.05	0.38	0.05	0.35	0.05	0.14	0.27	<0.05
Lithium Total	µg/L		0.5	7.1	0.5	30.3	0.5	9.4	11.3	<0.5
Magnesium Total	µg/L		50	4830	50	29000	50	4060	5450	<50
Manganese Total	µg/L		1	145	1	1140	1	174	225	<1
Mercury Total	µg/L		0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01
Molybdenum Total	µg/L		0.1	<0.1	0.1	0.1	0.1	<0.1	<0.1	<0.1
Nickel Total	µg/L		0.5	42.4	0.5	277	0.5	36.1	48.2	<0.5
Selenium Total	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5
Silver Total	µg/L		0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02
Sodium Total	µg/L		100	810	100	4010	100	1060	1190	<100
Thallium Total	µg/L		0.02	<0.02	0.02	0.02	0.02	<0.02	<0.02	<0.02
Titanium Total	µg/L		1	6	1	7	1	1	3	<1
Uranium Total	µg/L		0.01	0.05	0.01	0.06	0.01	0.01	0.02	<0.01
Vanadium Total	µg/L		1	2	1	2	1	<1	1	<1
Zinc Total	µg/L		5	134	5	781	5	126	160	<5
Total Hardness (calc)	ug CaCO3/L		100	33800	100	270000	100	41100	79100	<100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Angela Bond

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

British Columbia CSR- Schedule 6 Dissolved Metals

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		15MW01	Dup 01	15MW07
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		10/10/2015	10/10/2015	10/10/2015
Parameter	Unit	G / S	RDL	7080691	7080695	7080699
Aluminum Dissolved	µg/L		2	3	3	63
Antimony Dissolved	µg/L		0.2	<0.2	<0.2	<0.2
Arsenic Dissolved	µg/L		0.1	0.3	0.3	0.3
Barium Dissolved	µg/L		0.2	22.6	22.6	90.9
Beryllium Dissolved	µg/L		0.01	<0.01	<0.01	<0.01
Boron Dissolved	µg/L		2	7	7	19
Cadmium Dissolved	µg/L		0.01	0.02	0.01	0.30
Calcium Dissolved	µg/L		50	9400	9310	15700
Chromium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5
Cobalt Dissolved	µg/L		0.05	0.23	0.24	1.12
Copper Dissolved	µg/L		0.2	0.3	0.4	2.3
Iron Dissolved	µg/L		10	<10	<10	46
Lead Dissolved	µg/L		0.05	<0.05	<0.05	<0.05
Lithium Dissolved	µg/L		0.5	1.0	1.2	<0.5
Magnesium Dissolved	µg/L		50	1360	1320	2930
Manganese Dissolved	µg/L		1	48	46	150
Mercury Dissolved	µg/L		0.01	<0.01	<0.01	<0.01
Molybdenum Dissolved	µg/L		0.05	0.47	0.41	0.43
Nickel Dissolved	µg/L		0.2	0.6	0.6	3.9
Selenium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5
Silver Dissolved	µg/L		0.02	<0.02	<0.02	<0.02
Sodium Dissolved	µg/L		50	2400	2470	2020
Thallium Dissolved	µg/L		0.01	<0.01	<0.01	0.01
Titanium Dissolved	µg/L		0.5	0.8	0.7	3.9
Uranium Dissolved	µg/L		0.01	0.05	0.05	0.04
Vanadium Dissolved	µg/L		0.5	<0.5	<0.5	<0.5
Zinc Dissolved	µg/L		2	<2	<2	3
Hardness (calc)	ug CaCO3/L		100	29100	28700	51300

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

British Columbia CSR- Schedule 6 Dissolved Metals

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7080699 Sample not filtered at time of collection as per analysis requirements.
Dissolved Metals sample improperly preserved as per analysis requirements.
Dissolved Mercury sample container inappropriate as per analysis requirements.

Certified By: Angela Bond

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Chemical Oxygen Demand

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		15MW01	Dup 01	15MW07	SW1	SW2	SW3	SW4	Trip Blank
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		10/10/2015	10/10/2015	10/10/2015	10/9/2015	10/9/2015	10/9/2015	10/10/2015	9/29/2015
Parameter	Unit	G / S	RDL	7080691	7080695	7080699	7080701	7080702	7080703	7080704	7080705
COD	mg/L		10	13	12	158	33	24	19	31	<10

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Angela Bond

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Dissolved Organic Carbon in Water

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		15MW01	Dup 01	15MW07	SW1	SW2	SW3	SW4	Trip Blank
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		10/10/2015	10/10/2015	10/10/2015	10/9/2015	10/9/2015	10/9/2015	10/10/2015	9/29/2015
Parameter	**Unit**	**G / S**	**RDL**	**7080691**	**7080695**	**7080699**	**7080701**	**7080702**	**7080703**	**7080704**	**7080705**
Carbon Dissolved Organic	mg/L		0.5	1.4	0.9	15.8	9.0	5.7	5.5	8.5	<0.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Angela Bond

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Routine Water Analysis

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		SW1		SW2		SW3	SW4	Trip Blank
		SAMPLE TYPE:		Water		Water		Water	Water	Water
		DATE SAMPLED:		10/9/2015		10/9/2015		10/9/2015	10/10/2015	9/29/2015
Parameter	Unit	G / S	RDL	7080701	RDL	7080702	RDL	7080703	7080704	7080705
Total Dissolved Solids	mg/L		5	80	5	462	5	88	195	<5
Alkalinity (pH 4.5)	mg CaCO3/L		1	<1	1	<1	1	<1	<1	<1
Alkalinity, Bicarbonate	mg CaCO3/L		1	<1	1	<1	1	<1	<1	<1
Alkalinity, Carbonate	mg CaCO3/L		1	<1	1	<1	1	<1	<1	<1
Ortho-Phosphate	mg/L		0.001	<0.001	0.001	0.007	0.001	<0.001	0.001	<0.001
Calcium Total	µg/L		50	5570	50	60100	50	9760	22700	<50
Magnesium Total	µg/L		50	4830	50	29000	50	4060	5450	<50
Sodium Total	µg/L		100	810	100	4010	100	1060	1190	<100
Potassium Total	µg/L		100	252	100	1170	100	287	191	<100
Chloride	mg/L		0.05	0.09	0.5	25.1	0.05	6.36	46.2	<0.05
Nitrate-N	mg/L		0.005	0.129	0.005	0.020	0.005	0.028	0.009	<0.005
Nitrite-N	mg/L		0.005	<0.005	0.005	<0.005	0.005	<0.005	<0.005	<0.005
Sulphate	mg/L		0.5	44.8	5	308	0.5	44.8	39.1	<0.5
pH	pH units		0.01	4.03	0.01	3.79	0.01	4.16	3.91	4.68

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7080701-7080705 Literature holding time exceeded for pH analysis.

Certified By: Angela Bond

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Certificate of Analysis

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

CLIENT NAME: TETRA TECH EBA

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Routine Water Analysis

DATE RECEIVED: 2015-10-13

DATE REPORTED: 2015-10-15

		SAMPLE DESCRIPTION:		15MW01	Dup 01		15MW07
		SAMPLE TYPE:		Water	Water		Water
		DATE SAMPLED:		10/10/2015	10/10/2015		10/10/2015
Parameter	Unit	G / S	RDL	7080691	7080695	RDL	7080699
Total Dissolved Solids	mg/L		5	52	42	5	64
Alkalinity (pH 4.5)	mg CaCO3/L		1	25	22	1	38
Alkalinity, Bicarbonate	mg CaCO3/L		1	25	22	1	38
Alkalinity, Carbonate	mg CaCO3/L		1	<1	<1	1	<1
Ortho-Phosphate	mg/L		0.001	0.008	0.007	0.001	<0.001
Calcium Dissolved	µg/L		50	9400	9310	50	15700
Magnesium Dissolved	µg/L		50	1360	1320	50	2930
Sodium Dissolved	µg/L		50	2400	2470	50	2020
Potassium Dissolved	µg/L		50	433	424	50	545
Chloride	mg/L		0.05	9.44	9.26	0.05	5.33
Nitrate-N	mg/L		0.005	0.094	0.100	0.01	0.14
Nitrite-N	mg/L		0.005	<0.005	<0.005	0.005	<0.005
Sulphate	mg/L		0.5	2.9	2.9	0.5	7.4
pH	pH units		0.01	7.05	7.03	0.01	6.62

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7080691-7080699 Literature holding time exceeded for pH analysis.

Certified By:

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Quality Assurance

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: Oct 15, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
British Columbia Metals Schedule 4 and 5															
Antimony	7079506		0.3	0.3	NA	< 0.1	110%	70%	130%	104%	85%	115%			
Arsenic	7079506		5.3	5.5	3.8%	< 0.1	105%	70%	130%	97%	90%	110%			
Barium	7079506		44.0	46.4	5.4%	< 0.5	80%	70%	130%	100%	90%	110%			
Beryllium	7079506		0.1	0.1	NA	< 0.1	104%	70%	130%	106%	90%	110%			
Cadmium	7079506		0.02	0.02	NA	< 0.01	74%	70%	130%	102%	90%	110%			
Chromium	7079506		4	4	NA	< 1	106%	70%	130%	105%	90%	110%			
Cobalt	7079506		0.7	0.8	14.9%	< 0.1	111%	70%	130%	103%	90%	110%			
Copper	7079506		3.7	3.4	7.4%	< 0.2	104%	70%	130%	98%	90%	110%			
Lead	7079506		3.2	3.5	6.7%	< 0.1	96%	70%	130%	102%	90%	110%			
Mercury	7079506		<0.01	<0.01	NA	< 0.01	102%	70%	130%	105%	90%	110%			
Molybdenum	7079506		0.3	0.4	NA	< 0.2	99%	70%	130%	97%	90%	110%			
Nickel	7079506		3.3	3.7	11.1%	< 0.5	112%	70%	130%	107%	90%	110%			
Selenium	7079506		0.2	0.2	NA	< 0.1				106%	85%	115%			
Silver	7079506		<0.5	<0.5	NA	< 0.5				98%	90%	110%			
Thallium	7079506		<0.1	<0.1	NA	< 0.1	84%	70%	130%	101%	90%	110%			
Tin	7079506		<0.2	<0.2	NA	< 0.2				96%	90%	110%			
Uranium	7079506		0.2	0.2	NA	< 0.2	105%	70%	130%	101%	90%	110%			
Vanadium	7079506		11	10	1.4%	< 1	102%	70%	130%	101%	90%	110%			
Zinc	7079506		12	13	3.6%	< 1	110%	70%	130%	103%	90%	110%			
pH 1:2	7079506		5.4	5.4	0.2%	< 0.1	100%	90%	110%	100%	95%	105%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

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Quality Assurance

CLIENT NAME: TETRA TECH EBA
AGAT WORK ORDER: 15V029854
PROJECT: ENVH2O 03173-01
ATTENTION TO: KRISTEN RANGE
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Oct 15, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
LEPH/HEPH Soil															
Naphthalene	64801	7078975	<0.01	<0.01	0.0%	< 0.01	101%	80%	120%				95%	50%	130%
2-Methylnaphthalene	64801	7078975	<0.01	<0.01	0.0%	< 0.01	100%	80%	120%				84%	50%	130%
1-Methylnaphthalene	64801	7078975	<0.01	<0.01	0.0%	< 0.01	101%	80%	120%				90%	50%	130%
Acenaphthylene	64801	7078975	<0.01	<0.01	0.0%	< 0.01	97%	80%	120%				83%	50%	130%
Acenaphthene	64801	7078975	<0.01	<0.01	0.0%	< 0.01	99%	80%	120%				103%	50%	130%
Fluorene	64801	7078975	<0.02	<0.02	0.0%	< 0.02	98%	80%	120%				95%	50%	130%
Phenanthrene	64801	7078975	<0.02	<0.02	0.0%	< 0.02	99%	80%	120%				73%	60%	130%
Anthracene	64801	7078975	<0.02	<0.02	0.0%	< 0.02	90%	80%	120%				83%	60%	130%
Fluoranthene	64801	7078975	<0.05	<0.05	0.0%	< 0.05	91%	80%	120%				83%	60%	130%
Pyrene	64801	7078975	<0.02	<0.02	0.0%	< 0.02	92%	80%	120%				79%	60%	130%
Benzo(a)anthracene	64801	7078975	<0.02	<0.02	0.0%	< 0.02	95%	80%	120%				83%	60%	130%
Chrysene	64801	7078975	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				93%	60%	130%
Benzo(b)fluoranthene	64801	7078975	<0.02	<0.02	0.0%	< 0.02	97%	80%	120%				75%	60%	130%
Benzo(j)fluoranthene	64801	7078975	<0.02	<0.02	0.0%	< 0.02	98%	80%	120%				93%	60%	130%
Benzo(k)fluoranthene	64801	7078975	<0.02	<0.02	0.0%	< 0.02	105%	80%	120%				93%	60%	130%
Benzo(a)pyrene	64801	7078975	<0.05	<0.05	0.0%	< 0.05	94%	80%	120%				80%	60%	130%
Indeno(1,2,3-c,d)pyrene	64801	7078975	<0.02	<0.02	0.0%	< 0.02	99%	80%	120%				80%	60%	130%
Dibenzo(a,h)anthracene	64801	7078975	<0.02	<0.02	0.0%	< 0.02	100%	80%	130%				76%	60%	130%
Benzo(g,h,i)perylene	64801	7078975	<0.05	<0.05	0.0%	< 0.05	83%	80%	120%				88%	60%	130%
Naphthalene - d8	64801	7078975	64	81	23.0%		99%	80%	120%				89%	50%	130%
2-Fluorobiphenyl	64801	7078975	75	94	22.0%		108%	80%	120%				100%	50%	130%
P-Terphenyl - d14	64801	7078975	70	90	25.0%		89%	80%	120%				86%	60%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Volatile Organic Compounds in Soil															
Chloromethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				122%	60%	140%
Vinyl Chloride	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				115%	60%	140%
Bromomethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				116%	60%	140%
Chloroethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				114%	60%	140%
Trichlorofluoromethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				110%	70%	130%
Acetone	64801	7072941	<0.5	<0.5	0.0%	< 0.5	100%	80%	120%				119%	70%	130%
1,1-Dichloroethene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				114%	70%	130%
Dichloromethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				115%	70%	130%
Methyl tert-butyl ether (MTBE)	64801	7072941	<0.1	<0.1	0.0%	< 0.1	97%	80%	120%				103%	70%	130%
2-Butanone (MEK)	64801	7072941	<0.5	<0.5	0.0%	< 0.5	98%	80%	120%				92%	70%	130%
trans-1,2-Dichloroethene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	97%	80%	120%				104%	70%	130%
1,1-Dichloroethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				95%	70%	130%
cis-1,2-Dichloroethene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				98%	70%	130%
Chloroform	64801	7072941	<0.05	<0.05	0.0%	< 0.05	97%	80%	120%				101%	70%	130%

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Quality Assurance

CLIENT NAME: TETRA TECH EBA
AGAT WORK ORDER: 15V029854
PROJECT: ENVH2O 03173-01
ATTENTION TO: KRISTEN RANGE
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Oct 15, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,2-Dichloroethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	97%	80%	120%				103%	70%	130%
1,1,1-Trichloroethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	97%	80%	120%				101%	70%	130%
Carbon Tetrachloride	64801	7072941	<0.02	<0.02	0.0%	< 0.02	98%	80%	120%				102%	70%	130%
Benzene	64801	7072941	<0.02	<0.02	0.0%	< 0.02	98%	80%	120%				102%	70%	130%
1,2-Dichloropropane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				101%	70%	130%
Trichloroethene	64801	7072941	<0.01	<0.01	0.0%	< 0.01	97%	80%	120%				104%	70%	130%
Bromodichloromethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				103%	70%	130%
trans-1,3-Dichloropropene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				99%	60%	140%
4-Methyl-2-pentanone (MIBK)	64801	7072941	<0.5	<0.5	0.0%	< 0.5	99%	80%	120%				100%	70%	130%
cis-1,3-Dichloropropene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				98%	60%	140%
1,1,2-Trichloroethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	97%	80%	120%				102%	70%	130%
Toluene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	97%	80%	120%				99%	70%	130%
Dibromochloromethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				104%	70%	130%
Ethylene Dibromide	64801	7072941	<0.05	<0.05	0.0%	< 0.05	97%	80%	120%				101%	70%	130%
Tetrachloroethene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	97%	80%	120%				101%	70%	130%
1,1,1,2-Tetrachloroethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				107%	70%	130%
Chlorobenzene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				104%	70%	130%
Ethylbenzene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				101%	70%	130%
m&p-Xylene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				103%	70%	130%
Bromoform	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				111%	70%	130%
Styrene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				103%	70%	130%
1,1,2,2-Tetrachloroethane	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				106%	70%	130%
o-Xylene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				104%	70%	130%
1,3-Dichlorobenzene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				103%	70%	130%
1,4-Dichlorobenzene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	98%	80%	120%				103%	70%	130%
1,2-Dichlorobenzene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				100%	70%	130%
1,2,4-Trichlorobenzene	64801	7072941	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				99%	70%	130%
Bromofluorobenzene	64801	7072941	106	99	7.0%		94%	60%	140%				108%	60%	140%
Dibromofluoromethane	64801	7072941	113	111	2.0%		91%	60%	140%				93%	60%	140%
Toluene - d8	64801	7072941	114	119	4.0%		90%	60%	140%				92%	60%	140%
VPH	64801	7072941	<10	<10	0.0%	< 10									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Volatile Organic Compounds in Water

Chloromethane	64800	7067258	<1	<1	0.0%	< 1	97%	80%	120%				84%	70%	130%
Vinyl Chloride	64800	7067258	<1	<1	0.0%	< 1	98%	80%	120%				85%	70%	130%
Bromomethane	64800	7067258	<1	<1	0.0%	< 1	97%	80%	120%				95%	70%	130%
Chloroethane	64800	7067258	<1	<1	0.0%	< 1	97%	80%	120%				88%	70%	130%
Trichlorofluoromethane	64800	7067258	<1	<1	0.0%	< 1	98%	80%	120%				89%	70%	130%
Acetone	64800	7067258	<10	<10	0.0%	< 10	99%	80%	120%						

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Quality Assurance

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Oct 15, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,1-Dichloroethene	64800	7067258	<1	<1	0.0%	< 1	100%	80%	120%				89%	70%	130%
Dichloromethane	64800	7067258	<1	<1	0.0%	< 1	105%	80%	120%				93%	70%	130%
Methyl tert-butyl ether (MTBE)	64800	7067258	<1	<1	0.0%	< 1	106%	80%	120%				103%	70%	130%
2-Butanone (MEK)	64800	7067258	<10	<10	0.0%	< 10	113%	80%	120%						
trans-1,2-Dichloroethylene	64800	7067258	<1	<1	0.0%	< 1	104%	80%	120%				95%	70%	130%
1,1-Dichloroethane	64800	7067258	<1	<1	0.0%	< 1	108%	80%	120%				98%	70%	130%
cis-1,2-Dichloroethylene	64800	7067258	<1	<1	0.0%	< 1	114%	80%	120%				103%	70%	130%
Chloroform	64800	7067258	5	5	0.0%	< 1	111%	80%	120%				100%	70%	130%
1,2-Dichloroethane	64800	7067258	<1	<1	0.0%	< 1	116%	80%	120%				108%	70%	130%
1,1,1-Trichloroethane	64800	7067258	<1	<1	0.0%	< 1	111%	80%	120%				99%	70%	130%
Carbon Tetrachloride	64800	7067258	<0.5	<0.5	0.0%	< 0.5	110%	80%	120%				99%	70%	130%
Benzene	64800	7067258	<0.5	<0.5	0.0%	< 0.5	110%	80%	120%				100%	70%	130%
1,2-Dichloropropane	64800	7067258	<1	<1	0.0%	< 1	115%	80%	120%				108%	70%	130%
Trichloroethene	64800	7067258	<1	<1	0.0%	< 1	105%	80%	120%				99%	70%	130%
Bromodichloromethane	64800	7067258	<1	<1	0.0%	< 1	112%	80%	120%				103%	70%	130%
trans-1,3-Dichloropropene	64800	7067258	<1	<1	0.0%	< 1	112%	80%	120%				108%	70%	130%
4-Methyl-2-pentanone (MIBK)	64800	7067258	<10	<10	0.0%	< 10	116%	80%	120%				NA	70%	130%
cis-1,3-Dichloropropene	64800	7067258	<1	<1	0.0%	< 1	112%	80%	120%				101%	70%	130%
1,1,2-Trichloroethane	64800	7067258	<1	<1	0.0%	< 1	107%	80%	120%				102%	70%	130%
Toluene	64800	7067258	<0.5	<0.5	0.0%	< 0.5	109%	80%	120%				101%	70%	130%
Dibromochloromethane	64800	7067258	<1	<1	0.0%	< 1	105%	80%	120%				99%	70%	130%
Ethylene Dibromide	64800	7067258	<0.3	<0.3	0.0%	< 0.3	107%	90%	110%				104%	70%	130%
Tetrachloroethene	64800	7067258	<1	<1	0.0%	< 1	103%	80%	120%				89%	70%	130%
1,1,1,2-Tetrachloroethane	64800	7067258	<1	<1	0.0%	< 1	103%	90%	110%				101%	70%	130%
Chlorobenzene	64800	7067258	<1	<1	0.0%	< 1	105%	80%	120%				100%	70%	130%
Ethylbenzene	64800	7067258	<0.5	<0.5	0.0%	< 0.5	107%	80%	120%				102%	70%	130%
m&p-Xylene	64800	7067258	<0.5	<0.5	0.0%	< 0.5	107%	80%	120%				103%	70%	130%
Bromoform	64800	7067258	<1	<1	0.0%	< 1	95%	80%	120%				99%	70%	130%
Styrene	64800	7067258	<0.5	<0.5	0.0%	< 0.5	97%	80%	120%				100%	70%	130%
1,1,2,2-Tetrachloroethane	64800	7067258	<1	<1	0.0%	< 1	98%	80%	120%				104%	70%	130%
o-Xylene	64800	7067258	<0.5	<0.5	0.0%	< 0.5	98%	80%	120%				100%	70%	130%
1,3-Dichlorobenzene	64800	7067258	<0.5	<0.5	0.0%	< 0.5	102%	80%	120%				99%	70%	130%
1,4-Dichlorobenzene	64800	7067258	<0.5	<0.5	0.0%	< 0.5	101%	80%	120%				100%	70%	130%
1,2-Dichlorobenzene	64800	7067258	<0.5	<0.5	0.0%	< 0.5	104%	80%	120%				104%	70%	130%
1,2,4-Trichlorobenzene	64800	7067258	<1	<1	0.0%	< 1	107%	80%	120%				109%	70%	130%
Bromofluorobenzene	64800	7067258	80	76	5.0%		96%	80%	120%				96%	70%	130%
Dibromofluoromethane	64800	7067258	106	101	5.0%		104%	70%	130%				106%	70%	130%
Toluene - d8	64800	7067258	105	95	10.0%		106%	80%	120%				108%	70%	130%
VPH	64800	7067258	<100	<100	0.0%	< 100									

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Quality Assurance

CLIENT NAME: TETRA TECH EBA
AGAT WORK ORDER: 15V029854
PROJECT: ENVH2O 03173-01
ATTENTION TO: KRISTEN RANGE
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Oct 15, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
LEPH/HEPH/EPH Water															
Naphthalene	64797	W-MS	0.40	0.41	2.5%	< 0.05	99%	80%	120%				82%	50%	130%
Quinoline	64797	W-MS	0.5	0.5	0.0%	< 0.1	97%	80%	120%				109%	50%	130%
Acenaphthylene	64797	W-MS	0.32	0.34	6.0%	< 0.05	100%	80%	120%				65%	50%	130%
Acenaphthene	64797	W-MS	0.36	0.39	8.0%	< 0.05	96%	80%	120%				72%	50%	130%
Fluorene	64797	W-MS	0.40	0.41	2.5%	< 0.05	96%	80%	120%				82%	50%	130%
Phenanthrene	64797	W-MS	0.35	0.35	0.0%	< 0.05	100%	80%	120%				71%	60%	130%
Anthracene (Water)	64797	W-MS	0.36	0.37	2.7%	< 0.05	101%	80%	120%				73%	60%	130%
Acridine	64797	W-MS	0.52	0.48	8.0%	< 0.05	100%	80%	120%				104%	50%	130%
Fluoranthene	64797	W-MS	0.40	0.41	2.5%	< 0.05	99%	80%	120%				80%	60%	130%
Pyrene	64797	W-MS	0.40	0.41	2.5%	< 0.02	97%	80%	120%				80%	60%	130%
Benzo(a)anthracene	64797	W-MS	0.32	0.32	0.0%	< 0.05	101%	80%	120%				66%	60%	130%
Chrysene	64797	W-MS	0.46	0.48	4.0%	< 0.05	100%	80%	120%				94%	60%	130%
Benzo(b)fluoranthene	64797	W-MS	0.41	0.43	5.0%	< 0.05	101%	80%	120%				82%	60%	130%
Benzo(j)fluoranthene	64797	W-MS	0.54	0.56	4.0%	< 0.05	100%	80%	120%				109%	60%	130%
Benzo(k)fluoranthene	64797	W-MS	0.41	0.37	10.0%	< 0.05	101%	80%	120%				84%	60%	130%
Benzo(a)pyrene	64797	W-MS	0.34	0.33	3.0%	< 0.01	95%	80%	120%				68%	60%	130%
Indeno(1,2,3-c,d)pyrene	64797	W-MS	0.34	0.34	0.0%	< 0.05	101%	80%	120%				68%	60%	130%
Dibenzo(a,h)anthracene	64797	W-MS	0.33	0.33	0.0%	< 0.05	102%	80%	120%				66%	60%	130%
Benzo(g,h,i)perylene	64797	W-MS	0.38	0.38	0.0%	< 0.05	100%	80%	120%				76%	60%	130%
Naphthalene - d8	64797	W-MS	72	75	4.0%		98%	80%	120%				73%	50%	130%
2-Fluorobiphenyl	64797	W-MS	75	80	6.0%		96%	80%	120%				75%	50%	130%
P-Terphenyl - d14	64797	W-MS	76	82	8.0%		100%	80%	120%				77%	60%	130%
EPH C10-C19	64797	W-MS	7960	7590	5.0%	< 100	98%	70%	130%				89%	70%	130%
EPH C19-C32	64797	W-MS	9780	9250	6.0%	< 100	95%	70%	130%				89%	70%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

BTEX / VPH / LEPH / HEPH / EPH Water															
Methyl tert-butyl ether (MTBE)	64802	7080701	<1	<1	0.0%	< 1	100%	80%	120%				105%	70%	130%
Benzene	64802	7080701	<0.5	<0.5	0.0%	< 0.5	100%	80%	120%				98%	70%	130%
Toluene	64802	7080701	<0.5	<0.5	0.0%	< 0.5	100%	80%	120%				98%	70%	130%
Ethylbenzene	64802	7080701	<0.5	<0.5	0.0%	< 0.5	100%	80%	120%				97%	70%	130%
m&p-Xylene	64802	7080701	<0.5	<0.5	0.0%	< 0.5	100%	80%	120%				96%	70%	130%
o-Xylene	64802	7080701	<0.5	<0.5	0.0%	< 0.5	100%	80%	120%				97%	70%	130%
Styrene	64802	7080701	<0.5	<0.5	0.0%	< 0.5	100%	80%	120%				99%	70%	130%
VPH	64802	7080701	<100	<100	0.0%	< 100									
VH	64802	7080701	<100	<100	0.0%	< 100									
Bromofluorobenzene	64802	7080701	97	98	1.0%		100%	70%	130%				99%	70%	130%
Dibromofluoromethane	64802	7080701	103	106	3.0%		101%	70%	130%				101%	70%	130%

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Quality Assurance

CLIENT NAME: TETRA TECH EBA
AGAT WORK ORDER: 15V029854
PROJECT: ENVH2O 03173-01
ATTENTION TO: KRISTEN RANGE
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Oct 15, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Toluene - d8	64802	7080701	96	96	0.0%		100%	70%	130%				100%	70%	130%
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Volatile Organic Compounds in Water															
Chloromethane	64806	7080705	<1	<1	0.0%	< 1	99%	80%	120%				91%	70%	130%
Vinyl Chloride	64806	7080705	<1	<1	0.0%	< 1	99%	80%	120%				93%	70%	130%
Bromomethane	64806	7080705	<1	<1	0.0%	< 1	99%	80%	120%				107%	70%	130%
Chloroethane	64806	7080705	<1	<1	0.0%	< 1	99%	80%	120%				99%	70%	130%
Trichlorofluoromethane	64806	7080705	<1	<1	0.0%	< 1	99%	80%	120%				96%	70%	130%
Acetone	64806	7080705	<10	<10	0.0%	< 10	100%	80%	120%						
1,1-Dichloroethene	64806	7080705	<1	<1	0.0%	< 1	99%	80%	120%				97%	70%	130%
Dichloromethane	64806	7080705	<1	<1	0.0%	< 1	100%	80%	120%				98%	70%	130%
Methyl tert-butyl ether (MTBE)	64806	7080705	<1	<1	0.0%	< 1	97%	80%	120%				96%	70%	130%
2-Butanone (MEK)	64806	7080705	<10	<10	0.0%	< 10	98%	80%	120%						
trans-1,2-Dichloroethylene	64806	7080705	<1	<1	0.0%	< 1	97%	80%	120%				95%	70%	130%
1,1-Dichloroethane	64806	7080705	<1	<1	0.0%	< 1	98%	80%	120%				91%	70%	130%
cis-1,2-Dichloroethylene	64806	7080705	<1	<1	0.0%	< 1	98%	80%	120%				93%	70%	130%
Chloroform	64806	7080705	<1	<1	0.0%	< 1	97%	80%	120%				94%	70%	130%
1,2-Dichloroethane	64806	7080705	<1	<1	0.0%	< 1	97%	80%	120%				100%	70%	130%
1,1,1-Trichloroethane	64806	7080705	<1	<1	0.0%	< 1	97%	80%	120%				98%	70%	130%
Carbon Tetrachloride	64806	7080705	<0.5	<0.5	0.0%	< 0.5	98%	80%	120%				98%	70%	130%
Benzene	64806	7080705	<0.5	<0.5	0.0%	< 0.5	98%	80%	120%				102%	70%	130%
1,2-Dichloropropane	64806	7080705	<1	<1	0.0%	< 1	98%	80%	120%				104%	70%	130%
Trichloroethene	64806	7080705	<1	<1	0.0%	< 1	97%	80%	120%				102%	70%	130%
Bromodichloromethane	64806	7080705	<1	<1	0.0%	< 1	98%	80%	120%				101%	70%	130%
trans-1,3-Dichloropropene	64806	7080705	<1	<1	0.0%	< 1	98%	80%	120%				103%	70%	130%
4-Methyl-2-pentanone (MIBK)	64806	7080705	<10	<10	0.0%	< 10	99%	80%	120%				NA	70%	130%
cis-1,3-Dichloropropene	64806	7080705	<1	<1	0.0%	< 1	99%	80%	120%				99%	70%	130%
1,1,2-Trichloroethane	64806	7080705	<1	<1	0.0%	< 1	97%	80%	120%				101%	70%	130%
Toluene	64806	7080705	<0.5	<0.5	0.0%	< 0.5	97%	80%	120%				103%	70%	130%
Dibromochloromethane	64806	7080705	<1	<1	0.0%	< 1	98%	80%	120%				101%	70%	130%
Ethylene Dibromide	64806	7080705	<0.3	<0.3	0.0%	< 0.3	97%	90%	110%				102%	70%	130%
Tetrachloroethene	64806	7080705	<1	<1	0.0%	< 1	97%	80%	120%				90%	70%	130%
1,1,1,2-Tetrachloroethane	64806	7080705	<1	<1	0.0%	< 1	98%	90%	110%				105%	70%	130%
Chlorobenzene	64806	7080705	<1	<1	0.0%	< 1	98%	80%	120%				102%	70%	130%
Ethylbenzene	64806	7080705	<0.5	<0.5	0.0%	< 0.5	99%	80%	120%				103%	70%	130%
m&p-Xylene	64806	7080705	<0.5	<0.5	0.0%	< 0.5	99%	80%	120%				104%	70%	130%
Bromoform	64806	7080705	<1	<1	0.0%	< 1	99%	80%	120%				105%	70%	130%
Styrene	64806	7080705	<0.5	<0.5	0.0%	< 0.5	99%	80%	120%				107%	70%	130%
1,1,2,2-Tetrachloroethane	64806	7080705	<1	<1	0.0%	< 1	98%	80%	120%				101%	70%	130%

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Quality Assurance

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Oct 15, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
o-Xylene	64806	7080705	<0.5	<0.5	0.0%	< 0.5	98%	80%	120%				103%	70%	130%
1,3-Dichlorobenzene	64806	7080705	<0.5	<0.5	0.0%	< 0.5	98%	80%	120%				104%	70%	130%
1,4-Dichlorobenzene	64806	7080705	<0.5	<0.5	0.0%	< 0.5	98%	80%	120%				104%	70%	130%
1,2-Dichlorobenzene	64806	7080705	<0.5	<0.5	0.0%	< 0.5	99%	80%	120%				104%	70%	130%
1,2,4-Trichlorobenzene	64806	7080705	<1	<1	0.0%	< 1	99%	80%	120%				100%	70%	130%
Bromofluorobenzene	64806	7080705	87	81	7.0%		94%	80%	120%				100%	70%	130%
Dibromofluoromethane	64806	7080705	82	80	2.0%		91%	70%	130%				93%	70%	130%
Toluene - d8	64806	7080705	84	82	2.0%		90%	80%	120%				97%	70%	130%
VPH	64806	7080705	<100	<100	0.0%	< 100									

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

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PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Ultra Trace Analysis

RPT Date: Oct 15, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dioxins & Furans (Soil, NATO 1988)															
2,3,7,8-Tetra CDD	1	7079506	< 0.9	< 0.9	NA	< 0.1	96%	40%	130%	NA	40%	130%	103%	40%	130%
1,2,3,7,8-Penta CDD	1	7079506	1.2	1.1	8.7%	< 0.1	95%	40%	130%	NA	40%	130%	104%	40%	130%
1,2,3,4,7,8-Hexa CDD	1	7079506	0.9	0.9	NA	< 0.2	95%	40%	130%	NA	40%	130%	106%	40%	130%
1,2,3,6,7,8-Hexa CDD	1	7079506	1.1	1.0	9.5%	< 0.1	130%	40%	130%	NA	40%	130%	96%	40%	130%
1,2,3,7,8,9-Hexa CDD	1	7079506	1.0	0.9	10.5%	< 0.1	83%	40%	130%	NA	40%	130%	124%	40%	130%
1,2,3,4,6,7,8-Hepta CDD	1	7079506	1	1	0.0%	< 0.1	99%	40%	130%	NA	40%	130%	104%	40%	130%
Octa CDD	1	7079506	10	9	10.5%	< 0.9	103%	40%	130%	NA	40%	130%	96%	40%	130%
2,3,7,8-Tetra CDF	1	7079506	0.7	0.7	0.0%	< 0.1	101%	40%	130%	NA	40%	130%	103%	40%	130%
1,2,3,7,8-Penta CDF	1	7079506	0.8	0.8	0.0%	< 0.1	100%	40%	130%	NA	40%	130%	104%	40%	130%
2,3,4,7,8-Penta CDF	1	7079506	0.9	0.8	11.8%	< 0.1	100%	40%	130%	NA	40%	130%	101%	40%	130%
1,2,3,4,7,8-Hexa CDF	1	7079506	1.4	1.3	7.4%	< 0.2	107%	40%	130%	NA	40%	130%	98%	40%	130%
1,2,3,6,7,8-Hexa CDF	1	7079506	0.9	0.9	NA	< 0.2	102%	40%	130%	NA	40%	130%	99%	40%	130%
2,3,4,6,7,8-Hexa CDF	1	7079506	1.4	1.3	7.4%	< 0.2	108%	40%	130%	NA	40%	130%	98%	40%	130%
1,2,3,7,8,9-Hexa CDF	1	7079506	1.0	0.9	NA	< 0.2	105%	40%	130%	NA	40%	130%	102%	40%	130%
1,2,3,4,6,7,8-Hepta CDF	1	7079506	1.6	1.5	6.5%	< 0.1	103%	40%	130%	NA	40%	130%	99%	40%	130%
1,2,3,4,7,8,9-Hepta CDF	1	7079506	1	1	0.0%	< 0.2	110%	40%	130%	NA	40%	130%	95%	40%	130%
Octa CDF	1	7079506	3	3	0.0%	< 0.6	106%	40%	130%	NA	40%	130%	93%	40%	130%

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Quality Assurance

CLIENT NAME: TETRA TECH EBA
AGAT WORK ORDER: 15V029854
PROJECT: ENVH2O 03173-01
ATTENTION TO: KRISTEN RANGE
SAMPLING SITE:
SAMPLED BY:

Water Analysis

RPT Date: Oct 15, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Ammonia, Nitrogen - Total Kjeldahl in Water															
Ammonia-N	7071731		0.54	0.55	2.0%	< 0.01	106%	85%	115%	97%	90%	110%			
Nitrogen - Total Kjeldahl (TKN)	7053031		1.5	1.4	10.2%	< 0.1	108%	85%	115%	96%	90%	110%			
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Chemical Oxygen Demand															
COD	7080691		< 10	< 10	NA	< 10	108%	85%	115%	99%	90%	110%			
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Dissolved Organic Carbon in Water															
Carbon Dissolved Organic	7071731		5.2	5.3	1.4%	< 0.5	105%	85%	115%	107%	90%	110%			
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
Routine Water Analysis															
Total Dissolved Solids	7087726		600	608	1.2%	< 5				100%	85%	115%			
Alkalinity (pH 4.5)	7083509		158	156	0.9%	< 1	100%	90%	110%						
Ortho-Phosphate	7071731		0.027	0.025	7.7%	< 0.001	101%	85%	115%	99%	90%	110%	98%	80%	120%
Calcium Dissolved	7080691		9400	9310	1.0%	< 50	107%	90%	110%	104%	90%	110%			
Magnesium Dissolved	7080691		1360	1330	2.1%	< 50	109%	90%	110%	108%	90%	110%			
Sodium Dissolved	7080691		2400	2460	2.8%	< 50	105%	90%	110%	107%	90%	110%			
Potassium Dissolved	7080691		433	445	2.9%	< 50	101%	90%	110%	99%	90%	110%			
Chloride	7080691		9.44	9.30	1.5%	< 0.05	96%	85%	115%	100%	90%	110%			
Nitrate-N	7080691		0.094	0.103	9.4%	< 0.005	99%	85%	115%	97%	90%	110%			
Nitrite-N	7080691		<0.005	<0.005	NA	< 0.005				107%	90%	110%			
Sulphate	7080691		2.9	2.9	1.5%	< 0.5	96%	85%	115%	95%	90%	110%			
pH	7083509		7.76	7.80	0.5%	< 0.01	100%	95%	105%						
Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.															
British Columbia CSR- Schedule 6 Dissolved Metals															
Aluminum Dissolved	7072894		3	3	NA	< 2	103%	90%	110%	107%	85%	115%			
Antimony Dissolved	7072894		<0.2	<0.2	NA	< 0.2	103%	90%	110%	99%	85%	110%			
Arsenic Dissolved	7072894		0.2	0.2	NA	< 0.1	104%	90%	110%	100%	90%	110%			
Barium Dissolved	7072894		9.6	9.3	3.2%	< 0.2	97%	90%	110%	94%	90%	110%			
Beryllium Dissolved	7072894		<0.01	<0.01	NA	< 0.01	106%	90%	110%	102%	90%	110%			
Boron Dissolved	7072894		9	9	NA	< 2	102%	90%	110%	104%	80%	120%			
Cadmium Dissolved	7072894		<0.01	0.01	NA	< 0.01	102%	90%	110%	100%	90%	110%			
Calcium Dissolved	7080691		9400	9310	1.0%	< 50	107%	90%	110%	104%	90%	110%			
Chromium Dissolved	7072894		<0.5	<0.5	NA	< 0.5	104%	90%	110%	101%	90%	110%			
Cobalt Dissolved	7072894		<0.05	<0.05	NA	< 0.05	107%	90%	110%	102%	90%	110%			
Copper Dissolved	7072894		14.8	14.4	2.5%	< 0.2	110%	90%	110%	93%	90%	110%			
Iron Dissolved	7080691		<10	<10	NA	< 10	102%	90%	110%	109%	90%	110%			

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Quality Assurance

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Oct 15, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Lead Dissolved	7072894		0.21	0.19	4.7%	< 0.05	109%	90%	110%	105%	90%	110%			
Lithium Dissolved	7072894		1.0	1.0	NA	< 0.5				102%	90%	110%			
Magnesium Dissolved	7080691		1360	1330	2.1%	< 50	109%	90%	110%	108%	90%	110%			
Manganese Dissolved	7080691		48	47	1.8%	< 1	106%	90%	110%	102%	90%	110%			
Mercury Dissolved	7080691		<0.01	<0.01	NA	< 0.01	109%	90%	110%	110%	90%	110%			
Molybdenum Dissolved	7072894		4.98	5.08	2.1%	< 0.05	99%	90%	110%	98%	90%	110%			
Nickel Dissolved	7072894		0.6	0.6	NA	< 0.2	102%	90%	110%	97%	90%	110%			
Selenium Dissolved	7072894		<0.5	<0.5	NA	< 0.5	102%	90%	110%	97%	85%	115%			
Silver Dissolved	7072894		<0.02	<0.02	NA	< 0.02				99%	90%	110%			
Sodium Dissolved	7080691		2400	2460	2.8%	< 50	105%	90%	110%	107%	90%	110%			
Thallium Dissolved	7072894		0.01	<0.01	NA	< 0.01	107%	90%	110%	103%	90%	110%			
Titanium Dissolved	7072894		1.3	1.2	NA	< 0.5				99%	90%	110%			
Uranium Dissolved	7072894		0.12	0.12	3.0%	< 0.01	102%	90%	110%	102%	90%	110%			
Vanadium Dissolved	7072894		1.1	1.1	NA	< 0.5	100%	90%	110%	97%	90%	110%			
Zinc Dissolved	7072894		10	9	NA	< 2	100%	90%	110%	94%	85%	115%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Biochemical Oxygen Demand

BOD (5 day)	7082048		56	53	5.5%	< 4	90%	70%	130%	88%	85%	115%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

British Columbia CSR - Schedule 6 Total Metals

Aluminum Total	7082311		2800	2820	0.8%	< 5	103%	85%	115%	96%	85%	115%			
Antimony Total	7082311		<0.5	<0.5	NA	< 0.5	112%	85%	115%	104%	90%	110%			
Arsenic Total	7082311		1.2	1.2	1.8%	< 0.1	98%	85%	115%	102%	90%	110%			
Barium Total	7082311		51.2	54.2	5.6%	< 0.5	109%	85%	115%	106%	90%	110%			
Beryllium Total	7082311		0.10	0.10	NA	< 0.05	99%	85%	115%	101%	90%	110%			
Boron Total	7082311		<5	<5	NA	< 5	97%	85%	115%	101%	80%	120%			
Cadmium Total	7082311		0.03	0.04	NA	< 0.01	103%	85%	115%	101%	90%	110%			
Calcium Total	7082311		21800	21900	0.5%	< 50	100%	85%	115%	102%	90%	110%			
Chromium Total	7082311		5.4	5.3	1.0%	< 0.5	105%	85%	115%	98%	90%	110%			
Cobalt Total	7082311		2.07	2.01	2.8%	< 0.05	110%	85%	115%	95%	90%	110%			
Copper Total	7082311		6.7	6.7	0.2%	< 0.5	107%	85%	115%	103%	90%	110%			
Iron Total	7082311		4230	4200	0.6%	< 10	108%	85%	115%	97%	90%	110%			
Lead Total	7082311		1.58	1.54	2.8%	< 0.05	101%	85%	115%	104%	90%	110%			
Lithium Total	7082311		3.3	3.4	1.8%	< 0.5				107%	90%	110%			
Magnesium Total	7082311		4790	4790	0.1%	< 50	102%	85%	115%	106%	90%	110%			
Manganese Total	7082311		87	86	0.8%	< 1	100%	85%	115%	100%	90%	110%			
Mercury Total	7082311		< 0.01	< 0.01	NA	< 0.01	114%	85%	115%	104%	90%	110%			
Molybdenum Total	7082311		0.4	0.4	NA	< 0.1	107%	85%	115%	106%	90%	110%			

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Quality Assurance

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AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Oct 15, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Nickel Total	7082311		7.0	7.0	0.7%	< 0.5	107%	85%	115%	97%	90%	110%			
Selenium Total	7082311		<0.5	<0.5	NA	< 0.5	107%	85%	115%	107%	85%	115%			
Silver Total	7082311		<0.02	<0.02	NA	< 0.02				98%	90%	110%			
Sodium Total	7082311		2360	2410	1.9%	< 100	101%	85%	115%	101%	90%	110%			
Thallium Total	7082311		0.05	0.04	NA	< 0.02	111%	85%	115%	100%	90%	110%			
Titanium Total	7082311		111	109	1.9%	< 1				97%	90%	110%			
Uranium Total	7082311		0.24	0.24	1.6%	< 0.01	96%	85%	115%	103%	90%	110%			
Vanadium Total	7082311		6	6	0.8%	< 1	100%	85%	115%	100%	90%	110%			
Zinc Total	7082311		12	11	NA	< 5	106%	85%	115%	97%	80%	120%			

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By: Angela Bond

AGAT Laboratories

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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Arsenic	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Barium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Beryllium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cadmium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Chromium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Cobalt	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Copper	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Lead	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Mercury	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Molybdenum	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Nickel	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Selenium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Silver	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Thallium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Tin	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Uranium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Vanadium	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
Zinc	MET-181-6102, LAB-181-4008	BC MOE Lab Manual C (SALM) and EPA 6020A	ICP-MS
pH 1:2	INOR-181-6031	BC MOE Lab Manual B (pH, Electrometric, Soil)	PH METER

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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Methyl tert-butyl ether (MTBE)	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Benzene	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Toluene	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Ethylbenzene	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
m&p-Xylene	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
o-Xylene	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Styrene	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VPH	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VH	ORG-180-5130	Modified from BC MOE Lab Manual Section D	GC/MS/FID
Naphthalene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Quinoline	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Acenaphthylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Acenaphthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Fluorene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Phenanthrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Acridine	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Benzo(a)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Chrysene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Benzo(b)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Benzo(j)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Benzo(a)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS

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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Benzo(g,h,i)perylene	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Naphthalene - d8	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
2-Fluorobiphenyl	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
P-Terphenyl - d14	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
LEPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
EPH C10-C19	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
EPH C19-C32	ORG-180-5134	Modified from BC MOE Lab Manual Section D (EPH)	GC/FID
Bromofluorobenzene	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Dibromofluoromethane	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Toluene - d8	ORG-180-5130	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Naphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
1-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(j)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS

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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dibenzo(a,h)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Naphthalene - d8	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Fluorobiphenyl	ORG-180-5102	modified from BC MOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5102	modified from BC MOE Lab Manual Section D (PAH)	GC/MS
LEPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
Anthracene (Water)	ORG-180-5133	Modified from BC MOE Lab Manual Section D	GC/MS
Naphthalene - d8			GC/MS
2-Fluorobiphenyl	ORG-180-5133	modified from BC MOE Lab Manual Section D	GC/MS
P-Terphenyl - d14	ORG-180-5133	modified from BC MOE Lab Manual Section D	GC/MS
Chloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Benzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2-Trichloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Tetrachloroethene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Styrene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5103	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VPH	ORG-180-5103	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID

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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Chloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Vinyl Chloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromomethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichlorofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Acetone	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Methyl tert-butyl ether (MTBE)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
2-Butanone (MEK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,2-Dichloroethylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Chloroform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Carbon Tetrachloride	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Benzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichloropropane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Trichloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromodichloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
trans-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
4-Methyl-2-pentanone (MIBK)	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
cis-1,3-Dichloropropene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2-Trichloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromochloromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylene Dibromide	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS

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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Tetrachloroethene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,1,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D	GC/MS
Chlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Ethylbenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
m&p-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromoform	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Styrene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,1,2,2-Tetrachloroethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
o-Xylene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,3-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,4-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2-Dichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
1,2,4-Trichlorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Bromofluorobenzene	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Dibromofluoromethane	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
Toluene - d8	ORG-180-5131	Modified from BC MOE Lab Manual Section D (VOC)	GC/MS
VPH	ORG-180-5131	Modified from BC MOE Lab Manual Sec D (VOC)	GC/MS/FID

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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Ultra Trace Analysis			
2,3,7,8-Tetra CDD	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,7,8-Penta CDD	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,4,7,8-Hexa CDD	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,6,7,8-Hexa CDD	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,7,8,9-Hexa CDD	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,4,6,7,8-Hepta CDD	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Octa CDD	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
2,3,7,8-Tetra CDF	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,7,8-Penta CDF	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
2,3,4,7,8-Penta CDF	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,4,7,8-Hexa CDF	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,6,7,8-Hexa CDF	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
2,3,4,6,7,8-Hexa CDF	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,7,8,9-Hexa CDF	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,4,6,7,8-Hepta CDF	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,4,7,8,9-Hepta CDF	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Octa CDF	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Total Tetrachlorodibenzodioxins	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Total Pentachlorodibenzodioxins	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Total Hexachlorodibenzodioxins	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Total Heptachlorodibenzodioxins	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Total PCDDs	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Total Tetrachlorodibenzofurans	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Total Pentachlorodibenzofurans	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Total Hexachlorodibenzofurans	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Total Heptachlorodibenzofurans	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Total PCDFs	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
2,3,7,8-Tetra CDD (TEF 1.0)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,7,8-Penta CDD (TEF 0.5)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,4,7,8-Hexa CDD (TEF 0.1)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,6,7,8-Hexa CDD (TEF 0.1)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,7,8,9-Hexa CDD (TEF 0.1)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,4,6,7,8-Hepta CDD (TEF 0.01)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Octa CDD (TEF 0.001)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
2,3,7,8-Tetra CDF (TEF 0.1)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,7,8-Penta CDF (TEF 0.05)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
2,3,4,7,8-Penta CDF (TEF 0.5)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,4,7,8-Hexa CDF (TEF 0.1)	HR_151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,6,7,8-Hexa CDF (TEF 0.1)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
2,3,4,6,7,8-Hexa CDF (TEF 0.1)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,7,8,9-Hexa CDF (TEF 0.1)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,4,6,7,8-Hepta CDF (TEF 0.01)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
1,2,3,4,7,8,9-Hepta CDF (TEF 0.01)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Octa CDF (TEF 0.001)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
Total PCDDs and PCDFs (TEQ)	HR-151-5400	MA.400 DF 1.0/EPA 1613	HRMS
13C-2378-TCDF	HR-151-5400	MA.400 DF 1.0	HRMS
13C-12378-PeCDF	HR-151-5400	MA.400 DF 1.0	HRMS
13C-23478-PeCDF	HR-151-5400	MA.400 DF 1.0	HRMS
13C-123478-HxCDF	HR-151-5400	MA.400 DF 1.0	HRMS

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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
13C-123678-HxCDF	HR-151-5400	MA.400 DF 1.0	HRMS
13C-234678-HxCDF	HR-151-5400	MA.400 DF 1.0	HRMS
13C-123789-HxCDF	HR-151-5400	MA.400 DF 1.0	HRMS
13C-1234678-HpCDF	HR-151-5400	MA.400 DF 1.0	HRMS
13C-1234789-HpCDF	HR-151-5400	MA.400 DF 1.0	HRMS
13C-2378-TCDD	HR-151-5400	MA.400 DF 1.0	HRMS
13C-12378-PeCDD	HR-151-5400	MA.400 DF 1.0	HRMS
13C-123478-HxCDD	HR-151-5400	MA.400 DF 1.0	HRMS
13C-123678-HxCDD	HR-151-5400	MA.400 DF 1.0	HRMS
13C-1234678-HpCDD	HR-151-5400	MA.400 DF 1.0	HRMS
13C-OCDD	HR-151-5400	MA.400 DF 1.0	HRMS

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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Ammonia-N	INOR-181-6001	Modified from SM 4500-NH3 G	CONTINUOUS FLOW ANALYZER
Nitrogen - Total Kjeldahl (TKN)	INOR-181-6034, LAB-181-4017	modified from EPA 351.2	SPECTROPHOTOMETER
BOD (5 day)	INOR-181-6032	Modified from SM 5210 B	PC TITRATE
Aluminum Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Antimony Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Arsenic Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Barium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Beryllium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Boron Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Cadmium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Calcium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Chromium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Cobalt Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Copper Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Iron Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Lead Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Lithium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Magnesium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Manganese Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Mercury Total	MET-181-6103	Modified from EPA 245.7	CV/AA
Molybdenum Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Nickel Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Selenium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Silver Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Sodium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Thallium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Titanium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Uranium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Vanadium Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS

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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Zinc Total	MET-181-6102, LAB-181-4009	Modified from SM 3125 B	ICP-MS
Aluminum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Antimony Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Arsenic Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Barium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Beryllium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Boron Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cadmium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Calcium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Chromium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Cobalt Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Copper Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Iron Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Lead Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Lithium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Magnesium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Manganese Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Mercury Dissolved	MET-181-6103, LAB-181-4015	Modified from EPA 245.7	CV/AA
Molybdenum Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Nickel Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Selenium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Silver Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Sodium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES
Thallium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Titanium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Uranium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Vanadium Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS
Zinc Dissolved	MET-181-6102, LAB-181-4015	Modified from SM 3125 B	ICP-MS

Unit 120, 8600 Glenlyon Parkway
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Method Summary

CLIENT NAME: TETRA TECH EBA

AGAT WORK ORDER: 15V029854

PROJECT: ENVH2O 03173-01

ATTENTION TO: KRISTEN RANGE

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
COD	INOR-181-6004	Modified from SM 5220 D	SPECTROPHOTOMETER
Carbon Dissolved Organic	INOR-181-6003	Modified from SM 5310 B	COMBUSTION
Total Dissolved Solids	INOR-181-6007	SM 2540 C, D & E	GRAVIMETRIC
Alkalinity (pH 4.5)	INOR-181-6000	Modified from SM 2320 B	PC TITRATE
Alkalinity, Bicarbonate	INOR-181-6000	Modified from SM 2320 B	PC TITRATE
Alkalinity, Carbonate	INOR-181-6000	Modified from SM 2320 B	PC TITRATE
Ortho-Phosphate	INOR-181-6021	Modified from SM 4500-P E	SPECTROPHOTOMETER
Potassium Total	MET-181-6101, LAB-181-4009	Modified from SM 3120 B	ICP/OES
Chloride	INOR-181-6002	Modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate-N	INOR-181-6002	Modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite-N	INOR-181-6002	Modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-181-6002	Modified from SM 4110 B	ION CHROMATOGRAPH
pH	INOR-181-6000	Modified from SM 4500-H+	PH METER
Potassium Dissolved	MET-181-6101, LAB-181-4015	Modified from SM 3120 B	ICP/OES

AGAT Laboratories
120 - 8600 Glenlyon Parkway
Burnaby, BC
V5J 0B6
P: 778.452.4000 • F: 778.452.4074

Chain of Custody Record

Laboratory Use Only
Arrival Temperature: 5°C
AGAT Job Number: 15V029854

Notes: 13 OCT 2015 2:45 pm

Report Information
Company: Tetra Tech EBA
Contact: Kristen Range
Address: 61 Wasson Place
Whitehorse YT
Phone: _____ Fax: _____
AGAT Quote #: _____
Client Project #: ENVH20 03173-01

Report Information
1. Name: Kristen Range
Email: Kristen.range@tetratech.com
2. Name: Stephan Klump
Email: Stephan.Klump@tetratech.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☐ Excel Format Included

Turnaround Time Required (TAT)
Regular TAT ☐ 5 to 7 working days
Rush TAT ☐ Day 2 - 100%
☐ Day 3 - 50%
☐ Day 4 - 25%
Date Required: _____
PLEASE CONTACT LABORATORY IF RUSH REQUIRED SAMPLE SUBMISSION CUT OFF FOR EFFECTIVE DATE BY 3 PM

Invoice To Same as above Yes ☒ / No ☐
Company: _____
Contact: _____
Address: _____
Phone: _____ Fax: _____
PO/AFE#: _____

Requirements *(Please Check)*
☐ BC CSR Soil
☐ AL ☐ IL ☐ PL ☐ CL ☐ RL
☐ BC CSR - Water
☐ DW ☐ AW ☐ IW ☐ LW
Schedule 11 *(Please Specify)*: _____
CCME *(Please Specify)*: _____
Other *(Please Specify)*: _____

LABORATORY USE (LAB ID #)	SAMPLE IDENTIFICATION	SAMPLE MATRIX	DATE/TIME SAMPLED	COMMENTS - SITE SAMPLE INFO. SAMPLE CONTAINMENT	NUMBER OF CONTAINERS	PRESERVED (Y/N)	HAZARDOUS (Y/N)	Hold for: ☐ 60 DAYS
7079503	15MW01 9.5 - 10.0m	Soil	Oct 7, 2015		4			
504	15 MW07 1.1 - 1.2m	Soil	Oct 8, 2015		2			
505	15 MW07 0.5 - 0.6m	Soil	Oct 8, 2015		2			
506	15 MW06 0.3 - 0.4m	Soil	Oct 8, 2015		2			
507	15 MW01 1.8 - 2m	Soil	Oct 7, 2015		4			
508	Dup 01 9.5 - 10.0m	Soil	Oct 7, 2015		4			
509	15 MW04 1.1 - 1.2m	Soil	Oct 7, 2015		4			
510	15 MW04 0.3 - 0.4m	Soil	Oct 7, 2015		4			
7080691	15MW01	GW	Oct 10, 2015	11:30				
695	Dup 01	GW	Oct 10, 2015	11:30				
699	15 MW07	GW	Oct 10, 2015	1:30				

Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
		Steven Purdy SPurdy	13 OCT 2015
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time

Page 1 of 2
No: 016447

Document #: DW-ISS-1500.003
Date Revised: July 16, 2015

AGAT Laboratories
120 - 8600 Glenlyon Parkway
Burnaby, BC
V5J 0B6
P: 778.452.4000 - F: 778.452.4074

Laboratory Use Only
Arrival Temperature: 5°C
AGAT Job Number: 15V029854
Notes: 13 Oct 205 2:45pm

Chain of Custody Record

Report Information
Company: Tetra Tech EBA
Contact:
Address:
Phone: Fax:
AGAT Quote #:
Client Project #:

Report Information
1. Name:
Email:
2. Name:
Email:

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☐ Excel Format Included

Turnaround Time Required (TAT)
Regular TAT ☐ 5 to 7 working days
Rush TAT ☐ Day 2 - 100% ☐ Day 3 - 50% ☐ Day 4 - 25%
Date Required:
PLEASE CONTACT LABORATORY IF RUSH REQUIRED SAMPLE SUBMISSION CUT OFF FOR EFFECTIVE DATE BY 3 PM

Invoice To Same as above Yes ☐ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/AFE#:

Requirements *(Please Check)*
☐ BC CSR Soil: ☐ AL ☐ IL ☐ PL ☐ CL ☐ RL
☐ BC CSR - Water: ☐ DW ☐ AW ☐ IW ☐ LW
Schedule 11 *(Please Specify)*
CCME *(Please Specify)*
Other *(Please Specify)*

LABORATORY USE (LAB ID #)	SAMPLE IDENTIFICATION	SAMPLE MATRIX	DATE/TIME SAMPLED	COMMENTS - SITE SAMPLE INFO. SAMPLE CONTAINMENT	NUMBER OF CONTAINERS	PRESERVED (Y/N)	HAZARDOUS (Y/N)	Hold for: ☐ 60 DAYS
701	SW1	SW	Oct 9, 2015 13:25					
702	SW2	SW	Oct 9, 2015 4:30					
703	SW3	SW	Oct 9, 2015 5:30					
704	SW4	SW	Oct 10, 2015 2:30					
705	Trip blank		Sept 29, 2015					

Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
		Steven Rudy SR 13 Oct 2015	
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time

Page 2 of 2
N°: 016448

Document #: DW-186-1500.003
Date Revised: July 16, 2015

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - BURNABY

Work Order # 15V029854

RECEIVING BASICS:
Received From: Novex Waybill #: _____

SAMPLE QUANTITIES:
Coolers: 3 Containers: 113

TIME SENSITIVE ISSUES:
Earliest Date Sampled: 07 OCT 2015 ALREADY EXCEEDED? (Yes) No
BOD, Nitrate, Nitrite, and ortho-phosphate have expired on SW samples

NON-CONFORMANCES:
3 temperatures of samples* and average of each cooler: (record differing temperatures on the CoC next to sample ID's) ***use jars when available**

(1) 5+5+5=5 °C (2) 5+~~6~~+5=5 °C (3) 5+5+5=5 °C (4) ___+___+___=___ °C

Was ice or ice pack present: (Yes) No

Integrity Issues:
Will subsample Dissolved Metals/Mercury from 500mL for Sample 15MW07 (incorrect preservation and not field filtered)

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date and Time: _____

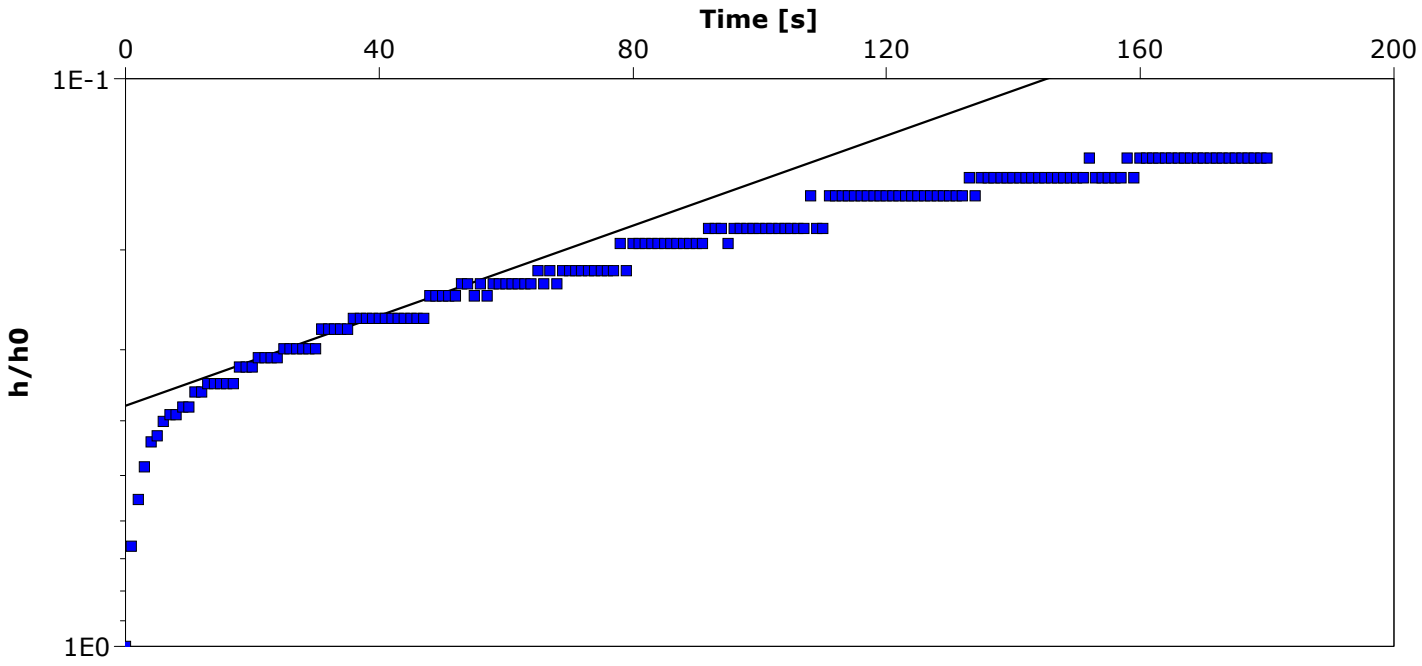
ADDITIONAL NOTES:

APPENDIX G

HYDRAULIC RESPONSE TEST DATA AND ANALYSIS

Tetra Tech EBA **61 Wasson Place** **Whitehorse, Yukon** **Y1A OH7**	**Slug Test Analysis Report**
	Project: Eagle Plains SWMF Hydrogeological Assessment
	Number: ENVH2O03173-01
	Client: SARU

Location: Eagle Plains SWMF	Slug Test: 15MW01-1	Test Well: Well 1
Test Conducted by: KRR		Test Date: 10/16/2015
Analysis Performed by: KRR	Bouwer and Rice	Analysis Date: 11/26/2015
Aquifer Thickness: 3.00 m		

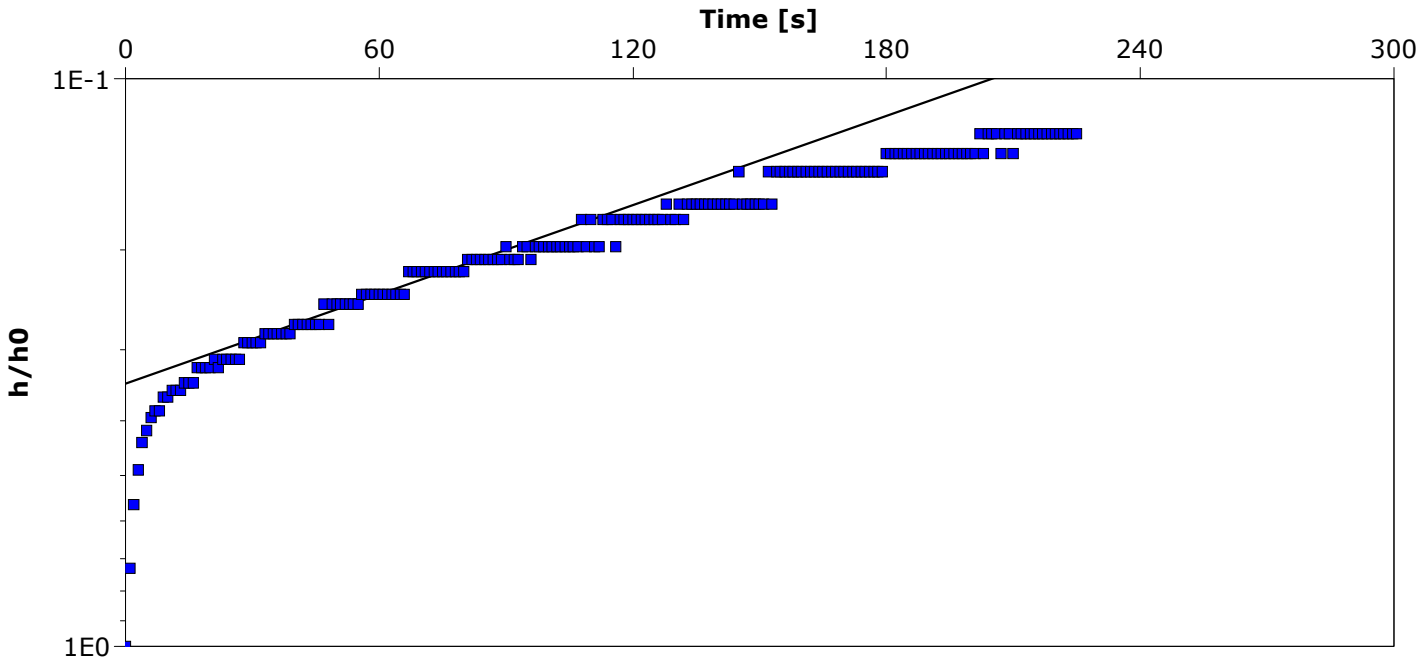


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
Well 1	1.06×10^{-6}	

Tetra Tech EBA **61 Wasson Place** **Whitehorse, Yukon** **Y1A OH7**	**Slug Test Analysis Report** Project: Eagle Plains SWMF Hydrogeological Assessment Number: ENVH2O03173-01 Client: SARU

Location: Eagle Plains SWMF	Slug Test: 15MW01-2	Test Well: Well 1
Test Conducted by:		Test Date: 11/27/2015
Analysis Performed by: KRR	Bouwer and Rice	Analysis Date: 11/27/2015
Aquifer Thickness: 3.00 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
Well 1	7.00×10^{-7}	