Groundwater Monitoring Program – 2017
Class I Waste Management Facility
Ryley, Alberta

PRESENTED TO

Clean Harbors Environmental Services, Inc.

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EXECUTIVE SUMMARY

Clean Harbors Environmental Services, Inc. (Clean Harbors) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct the 2017 Groundwater Monitoring Program (GMP) at the Ryley Landfill facility (the facility), located at the southeast quarter section of Section 9, Township 50, Range 17, West of the 4th Meridian, approximately 2 km north of the Village of Ryley, Alberta.

The facility is a Class I landfill, storage, and disposal facility, licensed to accept various hazardous waste liquids and solids for disposal and/or transfer to authorized treatment or disposal facilities in accordance with the Alberta's *Environmental Protection and Enhancement Act* (EPEA). The facility operates under Alberta Environment (AENV), currently Alberta Environment and Parks (AEP), EPEA Approval No. 10348-03-00 (as amended) (Approval). This approval was granted in March 2017, and is effective until March 31, 2027. Section 4.9.2 of the Approval states that a revised GMP plan must be submitted to AEP before September 30, 2017. The revised GMP was submitted to Clean Harbors and AEP under a separate cover. This report provides methods and results of the 2017 GMP conducted as per the current Approval requirements.

The objective of the 2017 GMP is to provide an assessment of the current groundwater conditions, comment on the results, and provide recommendations for future groundwater monitoring.

Tetra Tech conducted the GMP at the facility in May and June 2017. The 2017 GMP included monitoring and sampling of 52 existing monitoring wells at the facility.

The results of the 2017 GMP are summarized below:

- Similar to previous years, the interpreted groundwater elevations in May 2017 indicated that the facility is primarily located in a groundwater recharge area, creating a radial pattern of the groundwater flow both in shallow and deep groundwater zones.
- The natural groundwater type is sodium sulphate and natural mineralization accounts for high concentrations of sodium, sulphate, and total dissolved solids (TDS) concentrations in the groundwater at the facility.
- In 2017, dissolved metal and routine parameters were within the historical concentration ranges.
- Polycyclic aromatic hydrocarbons (PAHs) detected at MW26B in 2015 were not detected in 2016 and 2017. PAHs at other wells sampled were also non-detect.
- Overall, there were no indications of adverse groundwater impacts resulting from facility activities.

Based on the results of the 2017 GMP, the following is recommended for Clean Harbors' consideration.

- Monitoring wells MW25A, MW25B, MW26B, and MW27B should not be sampled in 2018 for PAHs, as PAH compounds were not detected at these wells in 2016 and 2017.
- The 2018 groundwater monitoring and sampling fieldwork should be conducted in late May or early June to minimize number of frozen wells and maximize groundwater availability for sampling. The parameters that were analyzed in 2017 should be continued to be analyzed in 2018, unless otherwise specified in the revised GMP plan.
- Standing water was observed near wells MW25A, MW25B, MW31A and MW31B during 2017 site visit. Clean fill material should be placed around the well casings to improve drainage, and reduce potential for wells to be damaged.
- As per the Approval requirements, the revised GMP plan was submitted to AEP before September 30, 2017 and will be implemented for future GMPs once it has been approved by AEP.

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LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Clean Harbors Environmental Services, Inc. and their agents. Tetra Tech Canada Inc. (Tetra Tech) 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 Clean Harbors Environmental Services, Inc., 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 Canada Inc.'s Services Agreement. Tetra Tech's General Conditions are provided in Appendix H of this report.

1.0 INTRODUCTION

Clean Harbors Environmental Services, Inc. (Clean Harbors) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct the 2017 Groundwater Monitoring Program (GMP) at the Ryley Landfill facility (the facility), located at the southeast quarter section of Section 9, Township 50, Range 17, West of the 4th Meridian, approximately 2 km north of the Village of Ryley, Alberta (Figure 1). The facility is a Class I landfill, storage, and disposal facility, licensed to accept various hazardous waste liquids and solids for disposal and/or transfer to authorized treatment or disposal facilities in accordance with the Alberta's *Environmental Protection and Enhancement Act* (EPEA).

The facility operates under Alberta Environment (AENV), currently Alberta Environment and Parks (AEP), EPEA Approval No. 10348-03-00 (as amended) (Approval). This approval was granted in March 2017, and is effective until March 31, 2027. Section 4.9.2 of the Approval states that a revised GMP plan must be submitted to AEP before September 30, 2017. The revised GMP was submitted under a separate cover. This report provides methods and results of the 2017 GMP conducted as per the current Approval requirements.

Tetra Tech conducted the GMP at the facility in May and June of 2017, which included monitoring and sampling of the existing 52 monitoring wells on site.

The objective of the GMP is to provide an assessment of the current groundwater conditions, comment on the results, and provide recommendations for future groundwater monitoring.

Mr. Stan Yuha, Facility Manager at Clean Harbors provided written authorization to proceed with this work to Tetra Tech on May 17, 2017.

2.0 SCOPE OF WORK

The scope of work for the 2017 monitoring program included:

- Measuring groundwater levels within each monitoring well and observing monitoring well integrity;
- Purging each well until approximately three standing well volumes of water had been removed or until practically dry, and allowing the water level in the well to recover prior to sampling;
- Collecting groundwater samples from each monitoring well within the sampling program, and submitting samples for laboratory chemical analyses;
- Evaluating groundwater data promptly so any unusual findings can be reported in a timely manner; and
- Preparing an annual report to summarize the field activities undertaken during the year, providing and interpreting the measured groundwater levels and groundwater analytical results.

3.0 GROUNDWATER REGULATORY CONTEXT

Section 4.9.7(a) of the Approval specifies the water quality objectives in the Canadian Environmental Quality Guidelines (CEQG) for drinking water, published by the Canadian Council of Ministers of the Environment (CCME) are to be used for comparison for groundwater samples. The CCME now directs users to the Health Canada Federal Provincial Territorial Committee on Drinking Water Guidelines for Canadian Drinking Water Quality (CDWQ guidelines) (Health Canada, 2017). All analytical data from monitoring wells on site are compared to the CDWQ guidelines.

The Approval also states that groundwater is to be compared to background groundwater chemistry. Groundwater chemistry from monitoring well MW11 has been used in the past as background chemistry.

Nested wells installed in 2015 (15MW35A, 15MW35B, 15MW35C and 15MW35-Deep) are located approximately 100 m away from the facility operations and may be considered to represent background groundwater quality. However, additional monitoring and sampling data is required to use these wells as background wells. Once at least three sets of data have been collected, and the groundwater flow system is considered to be stabilized and representative of background groundwater conditions, statistical averages of the parameters analysed will be used for comparison purposes.

Monitoring wells were installed in 2016 in the adjacent quarter section north of the facility as part of an application to expand the facility. These monitoring wells are currently being monitored and sampled as part of a baseline study. Once baseline data collection and analysis has been completed, it may also be possible to use these monitoring wells to represent background groundwater chemistry.

4.0 BACKGROUND INFORMATION

4.1 Groundwater

As required in Section 4.9.14(e) of the Approval, a water well database search must be conducted to a minimum of a 1.6 km radius from the facility. The Alberta Water Well Information Database (AEP, 2017) is maintained by AEP and was used to identify nearby licenced water wells. To account for the distance from the centre of the facility, and spatial inaccuracies within the water well database, a 2.0 km radius was used. The search provided records of 41 water wells as of July 2017.

Table A summarizes the well use within the search radius:

Table A: Water Well Information Database Summary

Domestic	Domestic & Industrial	Domestic & Stock	Industrial	Municipal	Observation Monitoring and Investigation	Stock	Unknown/ Other
7	2	3	1	2	13	2	11

The average drilling depth of the water wells is 50.5 m below ground level (mbgl), and the maximum depth is 140.2 mbgl. A full reconnaissance report is provided in Appendix B.

4.2 Surface Water

A map showing the locations of the surface water users, and a table containing the water allocation details is contained in Appendix B. Surface water sampling locations surrounding the facility (dugout sites as shown on Figure 2) are sampled annually in the fall of each year. The analytical results for these surface water sampling locations are reported under a separate cover.

Figures 3 shows the surface water drainage and historical monitoring well locations at the facility. The northwest corner of the facility is a local topographic high point for surface water. Ditches have been constructed around the waste cells to collect surface water and allow perimeter drainage to the retention pond, located on the east side of the facility. A ditch on the northern edge is sloped downward to the east along the north base of Cells 1 and 2 to a gravelled storage pad. It then drains water into a second ditch that conveys the surface runoff east to connect to the ditch that drains water to the retention pond. Surface water from the northwest corner also drains south, through a perimeter ditch that collects water from the west base of Cells 2 and 3A. At the southwest corner of Cell 3A, the ditch turns east to collect perimeter drainage along the south portion of the facility. Surface water then drains east into the retention pond. All surface water runoff is collected and not discharged off site until it meets surface water quality discharge requirements. Surface water from outside of the facility is diverted from flowing into the facility.

4.3 Geology and Hydrogeology

Various parties, (HCL, 1999, Stein, 1982, and APE, 2016), have documented regional geology and hydrogeology in the area. The data gathered from various reports are presented as Figures A, B and C in Appendix B.

The regional information suggest that the surficial geology in the area consists of unconsolidated glacial deposits (till), of Quaternary age. The till is up to 4 m thick beneath the facility and overlies Cretaceous sedimentary bedrock. The Bearpaw Formation underlies the till and consists of marine shales, silty shales, sandstone and bentonite beds that interfinger with sandstone. The Belly River Group lies underneath the Bearpaw Formation. The group contains the Oldman Formation, and the Continental and Marine Foremost Formations. In the upper portion of the group, bedrock consists mainly of non-marine, grey to greenish grey, thick bedded, feldspathic sandstone, grey, clayey siltstone, grey and green mudstone (Stein, 1982. Fenton, et al. 2013). Due to the similarities between the two units, and the overlapping deposition and subsequent interfingering of the layers, distinct boundaries are difficult to define. Together these formations are estimated up to approximately 24 m thick beneath the facility (Prior, et al. 2013). The nearest buried valley is reported to exist approximately 5 km to the north of the site, (Appendix B, Figure A).

Based on review of a hydrogeological report and map of the area east of Edmonton (Stein and Carlson, 2005), the regional groundwater flow is inferred to generally mimic the surface topography in the area. This would suggest a flow towards the north to Beaverhill Lake and eventually to the North Saskatchewan River, although local flow direction may vary. Hydraulic conductivity values for the Belly River and Bearpaw Formations are reported to be approximately 0.5 m/day (5.8×10^{-6} m/s). The facility is situated in an area where groundwater in the bedrock contains total dissolved solids (TDS) concentrations ranging from 1,500 mg/L to more than 8,000 mg/L. Groundwater chemistry within the till material is naturally mineralized, and is sodium sulphate water type.

Geologic cross-section alignments are shown on Figure 4a and cross-sections through different portions of the facility are presented in Figures 4b to 4e. Complete borehole logs are presented in Appendix C.

4.4 Groundwater Monitoring Network

There are 52 existing monitoring wells at the facility. All 52 wells were monitored and sampled in May and June 2017, however 15MW35C had insufficient water after being purged and did not recover in sufficient time, and therefore could not be sampled. The locations of the monitoring wells are shown on Figure 3.

5.0 FIELD WORK METHODS

5.1 Safety

Tetra Tech contacted Clean Harbors prior to starting fieldwork to coordinate field activities. A Tetra Tech safe work form (SWF) that identified hazards on site, and associated hazard controls was completed before beginning the fieldwork. Tetra Tech personnel reviewed and signed the SWF before starting work each day.

5.2 Groundwater Monitoring and Sampling

Tetra Tech personnel followed environmental industry accepted practices to ensure that representative groundwater samples were obtained for analysis. Monitoring of the monitoring well network was conducted on May 30, and sampling on June 1, 6, and 7, 2017. Monitoring and sampling involved the following field activities and data collection process:

- Recorded static groundwater levels in each well using an interface probe;
- Purged water from each monitoring well by removing three well volumes, or until nearly dry;
- Recorded volume and description of the groundwater purged;
- Recorded field parameters including electrical conductivity (EC), pH, and temperature using a multi meter probe;
- Allowed wells to recover groundwater levels to sufficient levels in order to obtain representative samples; and
- Collected groundwater samples using dedicated rigid polyvinyl chloride (PVC) bailers or Waterra tubing with a foot valve. Deep monitoring wells 15MW35-Deep and 15MW36-Deep were sampled using Hydrasleeves™.

Groundwater samples were collected in laboratory-supplied containers, stored in coolers with ice to keep sample temperature below 10°C throughout the fieldwork, and submitted to Maxxam Analytics (Maxxam) in Edmonton, Alberta under chain-of-custody (COC). A total of 56 samples were submitted; 51 samples from monitoring wells and five duplicate sets of samples from [MW22B (17DUP1), MW26B (17DUP2), MW28B (17DUP3), MW33B (17DUP4), and MW34A (17DUP5)]; Samples were analyzed for the following parameters as required by the Approval:

- pH;
- EC;
- Major ions (routine);
- Trace metals (dissolved);
- Nutrients (total Kjeldahl nitrogen [TKN] and ammonia-N);
- Chemical oxygen demand (COD);
- Dissolved organic carbon (DOC); and
- Benzene, toluene, ethylbenzene and xylenes (BTEX) and petroleum hydrocarbon (PHC) fractions F1 and F2.

In 2015, groundwater collected from monitoring well MW26B was analyzed for polycyclic aromatic hydrocarbons (PAHs) after PAHs were detected in soils near MW26B during the 2014 Soil Monitoring Program (Tetra Tech EBA, 2015). In 2015, Benzo(a) pyrene was detected at greater than the referenced guideline value, and all other PAH compounds were greater than laboratory detection limits. PAH analysis was continued in 2016 and 2017 at MW26B and also analysed in the samples collected from the adjacent wells MW25A, MW25B, and MW27B.

All wells were found to be in good condition; however, in 2017 standing water was observed surrounding wells MW25A, MW25B, MW31A and MW31B.

6.0 RESULTS

Laboratory analytical program for groundwater samples collected in 2017 is provided in Table 1. Table 2 shows the dates the monitoring wells were installed, and the hydro-stratigraphic units the wells are grouped into. Table 3 summarizes the well construction details and measured water levels for 2017. Table 4 summarizes historical groundwater elevations measured since 1991. The laboratory analytical results are presented in Tables 5.1A to 5.33B with results compared to the CDWQ guidelines.

The following Section 6.1 and Section 6.2 provide results of the groundwater conditions observed in 2017 (groundwater elevations and flow direction) and groundwater chemistry, respectively.

6.1 Groundwater Elevations and Flow Direction

The 2017 groundwater elevations in each of the 52 monitoring wells were compared to historic groundwater elevations from April 1991 to May 2017. The wells were resurveyed in 2015, and historic groundwater elevations were adjusted to the 2015 survey data.

The hydrographs based on the groundwater elevations measured in the monitoring wells installed in the surficial material, upper sandstone, clay shale, and lower bedrock units are shown on Figure 5. The groundwater elevations in 2017 on average 0.27 metres (m) higher overall compared to 2016 values.

Groundwater elevations in monitoring wells installed in 2015 (15MW34A, 15MW34B, 15MW35A, 15MW35B, 15MW36A, and 15MW36-Deep) showed greater variance between monitoring events from 2015 to 2016, however groundwater elevations at these wells appear to be generally consistent between 2016 and 2017. The difference between 2015 and 2016 groundwater elevations at these wells was likely due to the wells not being at equilibrium in 2015 when groundwater levels were measured shortly after being installed.

Groundwater elevations measured during the 2017 monitoring event were contoured using Surfer Mapping System Version 13. Contours were created by grouping wells within the same water bearing units, and interpolating groundwater elevation data between wells. Through analysis of the contour maps by using integrated software tools, an estimate of flow direction was determined. Professional judgement was applied to ensure that the information presented in the figures is reasonably applicable given site history and hydrogeological conditions.

Figures 6a through 6d show groundwater flow directions in four geologic units beneath the site including surficial material, upper sandstone, clay shale, and lower bedrock. The contours on each of these maps were created using wells screened across one distinct unit, within a general depth range. The historical monitoring wells, which were screened across multiple units, were not used to create these contour maps. The 2017 groundwater flow patterns in all units beneath the site were similar to 2016 patterns and are discussed below.

- Figure 6a shows groundwater elevation contour map for the clay till (surficial) unit. The screen depths range from 4.2 mbgl to 5.8 mbgl. Groundwater in this unit flows to the northeast. It is likely that this unit is discontinuous across the facility due to landfill cell depths and infrastructure construction.
- Figure 6b shows groundwater elevation contour map for the upper sandstone unit. This unit is likely laterally continuous in wells across the facility. Screen depths in this unit range from 4.5 mbgl to 13.9 mbgl. Groundwater in this unit appears to be split through the centre of the facility. Groundwater flows to the east in the eastern half of the facility, to the southwest in the western half of the facility, and there is little to no flow under Cell 3C.
- Figure 6c shows groundwater elevation contour map for the clay shale unit. This material is laterally continuous in wells across the facility. Screen depths range from 9.4 mbgl to 10.1 mbgl. The groundwater flow direction in this zone is to the east towards MW32A. Groundwater elevation data for this unit is limited for the east portion of the facility with only one monitoring well screened within this unit. On the west side of the facility, groundwater flow is to the southwest and northwest from the centre of the facility. Overall the groundwater flow direction in this unit is consistent with historical flow directions.
- Figure 6d shows deep groundwater elevation contour map, based on groundwater elevations monitored in four monitoring wells installed in the Belly River Formation. Additional data from two wells (16MW09A and 16MW11A) were used from the lateral expansion area to the north (Tetra Tech, 2016). Well depths in this zone range from 38.8 to 42.4 mbgl. The groundwater flow in this zone is interpreted to flow to the northeast and is overall in agreement with regional hydrogeological data.

From the 2017 groundwater elevations, and interpreted groundwater flow directions, the southwest area of the facility is considered to be generally up-gradient. Therefore, nested monitoring wells 15MW35A/B/C/Deep can be considered up-gradient monitoring wells.

Vertical and horizontal hydraulic gradients were also calculated, and are reported in Tables B and C, respectively.

Table B: Vertical Hydraulic Gradients

Wells	Vertical Groundwater Flow Direction
MW1B/MW1C, MW5A/MW5B, MW12A/MW12B, MW18A/MW18B, MW20A/MW20B MW21A/MW21B, MW22A/MW22B, MW24A/MW24B , MW26A/MW26B, MW28A/MW28B, MW31A/MW31B, MW33A/MW33B, MW34A/MW34B, MW35A/MW35B, MW36-Deep/MW36C	Downward
MW8A/MW8B, MW19A/MW19B, , MW23A/MW23B, MW25A/MW25B, MW27A/MW27B, MW29A/MW29B, MW30A/MW30B, MW32A/MW32B, MW35-Deep/MW35A	Upward

Table C: Horizontal Hydraulic Gradients

Hydro-stratigraphic Unit	Gradient (m/m)
Surficial Material	0.001 to 0.008
Upper Sandstone	0.001 to 0.01
Clay Shale	0.002 to 0.03
Lower Bedrock	0.002

6.2 Groundwater Chemistry

Parameters with concentrations greater than the CDWQ guidelines or outside of the CDWQ guidelines range are shaded on Tables 5.1A to 5.33B. Laboratory results are presented in Appendix D. Historical chemistry results are contained in Appendix E. Concentration trend graphs are provided in Appendix F.

As with previous years, groundwater data collected during 2017 show a moderate to high degree of mineralization exhibited by the elevated sodium, sulphate, and TDS concentrations.

The parameters exceeding the CDWQ guidelines and select parameters are discussed in the following Table D.

Table D: 2017 Analytical Results Summary for Select Parameters

Parameter	Drinking Water Guidelines for Canadian Drinking Water Quality	2017 Measured Concentrations	Greater than Guidelines Value in 2017	Comments
Sodium Appendix F1	200 mg/L	320 – 3200 mg/L	All Wells	▪ Sodium concentrations have remained within historical ranges, no notable trends are observed. ▪ An increase can be noted in 2017 in monitoring well MW24A.
Chloride Appendix F2	250 mg/L	< 1.0 – 1400.0 mg/L	MW35-Deep and MW36-Deep	▪ All monitoring wells have chloride concentrations less than the referenced guideline, except for MW35-Deep and MW36-Deep. ▪ Chloride concentrations have remained within historical levels at most wells. ▪ Increasing trends are observed in monitoring wells, MW9, MW10, and MW11.
Nitrate (N) Appendix F3	10 mg/L	<0.044 – 70.0 mg/L	MW1B, MW31A, MW20A and MW22A	▪ Trends show monitoring well MW22A has been consistently exceeding the guideline since 2012, and spiked to 70 mg/L in 2017. ▪ MW01B, MW01C, and MW20A have been less than the guideline since 2008, however, concentrations increased to greater than the guideline in 2017.
Sulphate Appendix F4	500 mg/L	<2.1 to 6400 mg/L	All wells, excluding MW18A, MW23A, MW30A, MW8A, MW5B, MW21A, MW25A, MW31A, MW33A, MW34A, MW34B, MW35-DEEP, MW35A, MW36-DEEP, MW36A and MW34A	▪ Sulphate concentrations have remained within historical ranges at most wells. ▪ A historical high of 6400 mg/l was observed in monitoring well MW-24A in 2017. ▪ An increasing trend is observed in monitoring well MW14.
TDS Appendix F5	500 mg/L	910 to 10,000 mg/L	All Wells	▪ TDS concentrations have remained within historical ranges at most monitoring wells. ▪ There is an increasing concentration trend in monitoring wells MW14 and MW24A, however it is likely caused by increasing sulphate concentrations, as the trends appear similar to those observed in sulphate, in the same wells.
pH (Laboratory) Appendix F6	6.5-8.5	7.65 – 9.09	MW19B, MW18A, MW36A, MW33A, MW1B, MW25A, MW26A, MW31A, MW30A, MW27A, MW35A, MW23A, MW5B	▪ pH values have remained within historical ranges, no notable trends are observed. ▪ Wells along the southern boundary, in the clay shale unit have an overall higher average pH levels, near the upper guideline limit of 8.5. ▪ Field pH values overall show a similar trend.
pH (Field) Appendix F7		6.9 – 8.8	MW23A, MW33A and MW36A	
Aluminum	0.1 mg/L	<0.003 – 0.55 mg/L	MW31A	▪ Aluminum has been greater than the guideline in monitoring well MW31A since monitoring began in 2015. ▪ At all other wells, aluminum concentrations were less than the guideline in 2017.
Iron (greater than guideline) Appendix F8	0.3 mg/L	0.18 – 0.31 mg/L	MW-31A and MW-34A	▪ Iron concentrations have generally remained within historical ranges. ▪ Some spikes in iron concentrations have been observed in the past, however, there are no increasing concentration trends observed. ▪ Iron concentrations range from 800 to 1100 mg/L in the lower bedrock monitoring wells. ▪ In 2017, groundwater samples with detection limits greater than guideline were diluted to bring the sample within the calibrated range while completing the analysis. Appendix D contains specific details under General Comments.
Iron (detection limit greater than guideline)		<0.6 mg/L	MW33B, MW12A, MW12B, MW24A, MW24B, MW8B, MW5A, MW29B, MW32A, MW32B, MW35B, MW28B, MW27B, MW23B, MW25B, MW26B, MW22A, MW22B, MW11, MW1C, MW19A, MW19B and MW20B	
Manganese Appendix F9	0.05 mg/L	<0.004 – 0.85 mg/L	MW12B, MW18B, MW19A, MW19B, MW1B, MW1C, MW23B, MW24A, MW25A, MW25B, MW26B, MW27B, MW28B, MW29A, MW29B, MW32A, MW32B, MW33B, MW34A, MW34B, MW35B, MW35-DEEP, MW36-DEEP, MW5A and MW8B	▪ Manganese concentrations across the facility appear to be stable. ▪ Manganese concentrations in monitoring wells MW5A, MW12B, MW24A and MW33B are observed to have slight increasing trends. ▪ Manganese has only been analyzed for three monitoring events. Further sampling is required to confirm trends.
Uranium	0.02 mg/L	0.00014 – 0.25 mg/L	MW11, MW12B, MW24A and MW24B	▪ No notable increasing concentration trends have been observed
Benzo(a) pyrene	0.00001 mg/L	0.0000075 mg/L	No Wells	▪ In 2015, MW26B had a benzo(a) pyrene concentration of 0.0015 mg/L greater than the guideline. However, in 2016 and 2017 all PAH parameters, including benzo(a) pyrene were non-detect at all wells sampled for PAH.

Concentrations of benzene were less than guidelines at all wells, however, monitoring well MW35A had a detectible concentration of 0.00049 mg/L (CDWQ guideline is 0.024 mg/L). Toluene, ethylbenzene, xylene, and PHC fractions F1 and F2 were not detected, and were less than referenced guidelines in all wells.

There are no CDWQ guidelines for ammonia, TKN, COD, or DOC. The table below summarizes the results of these parameters in 2017. No notable increasing trends have been observed for any of the parameters listed below.

Table E: Ammonia-N, TKN, COD and DOC Summary

Parameter	Maximum Concentration (mg/L)	Monitoring Well	Minimum Concentration (mg/L)	Monitoring Well	Average in All Wells (mg/L)
Ammonia Appendix F10	3.2	MW32A	0.016	MW21B	0.78
TKN Appendix F11	7.4	MW31A	0.31	MW21B	1.5
COD Appendix F12	300.0	MW31A	17.0	MW19B	56
DOC Appendix F13	60.0	MW34A	6.0	MW20A	15.5

6.3 Quality Assurance and Quality Control

To evaluate field sampling reproducibility, duplicate groundwater samples were collected during the sampling event in 2017. Duplicates were collected from MW22B (Dup 1), MW26B (Dup 2), MW28B (Dup 3), MW33B (Dup 4), and MW-34A (Dup 5) and submitted for laboratory analysis for the same suite of parameters as the parent samples.

The field sampling and laboratory testing reproducibility of each sample-duplicate pair was evaluated using the relative percent difference (RPD) method, involving calculation of RPD when both sample-duplicate concentrations were greater than, or equal to, five times the laboratory method detection limit (MDL), as shown in Equation 1.

Equation 1:

$$\%RPD = \left(\frac{|Sample - Duplicate|}{\overline{X}} \right) * 100$$

Where $\overline{X}$ is the calculated average concentration of the parent sample and the corresponding duplicate.

Groundwater quality parameters were considered as having passed the quality assurance and quality control (QA/QC) reproducibility procedure if the RPD was less than or equal to 30%, indicating a close correlation between the sample-duplicate pair.

The RPD values were not calculated if one or both of the sample-duplicate concentrations were between the MDL and five times the MDL. In these cases, groundwater quality parameters were still considered as having passed the QA/QC reproducibility procedure if the sample-duplicate concentration difference was less than one MDL value.

The RPD calculations are summarized in Table 6. These results indicate that all the parameters had RPD less than 20% except the following listed in Table F:

Table F: Parameters with RPD > 20%

MW22B and Duplicate 1	MW34A and Duplicate 5	MW33B Duplicate 4
Nitrate (N) = 25%	Arsenic = 24%	Nitrate and Nitrite (N) = 44%

The relatively low percent of RPD values for the majority of samples allow the 2017 results to be included into the historical database for trend comparison. Some systematic high RPD values were noted for ionic balance. After communication with Maxxam, the ionic balance calculations were manually checked and found to be correct.

6.4 Discussion

Groundwater quality at the background monitoring well MW11 has a high degree of natural mineralization producing elevated concentrations for sodium, sulphate, TDS, which exceeded the CDWQ guidelines.

All wells in the monitoring network have exhibited similar evidence of groundwater mineralization (sodium, sulphate, TDS and uranium) as observed at MW11. This is consistent with the chemical quality of the shallow groundwater reported in the area.

Chloride concentrations have overall, remained stable at the site since monitoring began in 1996. Between 2006 and 2012, monitoring wells MW9, MW5B and MW24B showed increasing trends, however they have since decreased to historical levels. Since approximately 2014, monitoring wells MW08B, MW9, MW10, MW11, MW18B, and MW27B have displayed slight increasing trends (Appendix F2). Monitoring wells MW08B, MW9, MW10 and MW11 are all located near the northeast corner of the site (Figure 3) and increasing trends in chloride concentrations could be due to the application of road salts in the area. Monitoring well MW18B is located on the northwestern side of the site, along the west border. Monitoring well MW27B is located near the southern border of the site.

Since groundwater monitoring and sampling at this facility has been conducted, nitrate concentrations at MW22A, which is located south of Cells 3A and 3B, have varied from less than to greater than the referenced guideline concentration of 10 mg/L (Appendix F3). In 2017, the nitrate concentration at MW22A increased from 17.0 mg/L to 70.0 mg/L, following a slight increase in 2016. The elevated nitrate concentrations detected at MW22A may be associated with previous land use in the area (i.e., agriculture, livestock, etc.) or potentially related to current livestock use immediately west of the facility. MW22A is located hydraulically down-gradient of Cells 3A and 3B. The sudden increase in nitrate concentration at MW22A in 2017, should be confirmed in 2018.

Historically pH values have been slightly greater or marginally less than the upper guideline value at monitoring locations. It is likely that pH is naturally elevated in the area.

The dissolved iron concentrations at monitoring well MW31A and MW34A were greater than the referenced guideline concentration of 0.3 mg/L in 2017. Iron concentrations at multiple monitoring wells (Table D) were reported having detection limits greater than the guideline value.

In 2017, concentrations of manganese were greater than the guideline value of 0.05 mg/L in several wells. Dissolved manganese has only been analyzed for the past three sampling events and further sampling is required to establish trends.

Dissolved iron and manganese concentrations appear to be related to naturally occurring anoxic subsurface conditions. The CDWQ guideline for both parameters is an aesthetic objective and therefore elevated concentrations are not considered a health risk to human consumption. However, changes in concentrations over time may be an indicator to redox reactions occurring in the groundwater and concentrations should continue to be assessed.

Uranium is reported as being in exceedance of guideline values at wells MW-12B, MW-24A and MW-24B. Uranium is considered to be naturally occurring in surface waters, and groundwater around Alberta within glacial till deposits (CCME, 2007).

In 2017, monitoring well MW26B was sampled to confirm PAH parameters concentrations observed in 2015 at this well. Also nearby wells MW25A, MW25B, and MW27B were analysed for PAH compounds. In 2016 and 2017, all PAH parameter concentrations were reported as less than the detection limits in all wells tested. Tetra Tech recommends that PAH sampling be removed from future monitoring at well MW26B and adjacent wells MW25A, MW25B, and MW27B as no PAH parameters were detected.

7.0 CONCLUSIONS

The 2017 groundwater monitoring report findings are summarized as follows:

- Similar to previous years, the interpreted groundwater elevations in May 2017 indicated that the facility is primarily located in a groundwater recharge area, creating a radial pattern of the groundwater flow both in shallow and deep groundwater zones.
- The natural groundwater type is sodium sulphate and natural mineralization accounts for high concentrations of sodium, sulphate, and TDS concentrations in the groundwater at the facility.
- In 2017, dissolved metal and routine parameters were within the historical concentration ranges.
- PAHs detected at MW26B in 2015 were not detected in 2016 and 2017. PAHs at other wells sampled were also not detected.
- Overall, there were no indications of adverse groundwater impacts resulting from facility activities.

8.0 RECOMMEDATIONS

Based on the results from the work conducted in 2017, the following is recommended for Clean Harbors' consideration:

- Monitoring wells MW25A, MW25B, MW26B, and MW27B should not be sampled in 2018 for PAHs, as PAH compounds were not detected at these wells in 2016 and 2017.
- The 2018 groundwater monitoring and sampling fieldwork should be conducted in late May or early June to minimize number of frozen wells and maximize groundwater availability for sampling. The parameters that were analyzed in 2017 should be continued to be analyzed in 2018, unless otherwise specified in the revised GMP plan.
- Standing water was observed near wells MW25A, MW25B, MW31A and MW31B during 2017 site visit. Clean fill material should be placed around the well casings to improve drainage, and reduce potential for wells to be damaged.
- As per the Approval requirements, the revised GMP plan was submitted to AEP before September 30, 2017 and will be implemented for future GMPs once it has been approved by AEP.

9.0 CLOSURE

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

Respectfully submitted,
Tetra Tech Canada Inc.

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PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date November 10, 2017
PERMIT NUMBER: P13774
The Association of Professional Engineers and Geoscientists of Alberta

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TABLES

Table 1: Summary of Laboratory Analytical Program - 2017

Clean Harbors Well Identification	Lab Analysis Parameters
52 wells (5 duplicates, 1 trip blank, 1 field blank)	pH (field and laboratory) Electrical Conductivity (field and laboratory) Major Ions (routine) Trace Metals (dissolved) Nutrients (Total Kjeldahl Nitrogen and ammonia-N) Chemical Oxygen Demand Dissolved Organic Carbon Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) Petroleum Hydrocarbon (PHC) Fractions F1 and F2 Polycyclic Aromatic Hydrocarbons (PAHs)

Table 2: Monitoring Well Identification System - Current Network

Well Identification	Date Installed	Unit Type
MW 1B	30-Sep-96	Clay Shale
MW 1C	14-Jun-11	Upper Sandstone
MW 5A	19-Feb-91	Upper Sandstone
MW 5B	23-Sep-96	Clay Shale
MW 8A	4-Oct-12	Clay Shale
MW 8B	4-Oct-12	Upper Sandstone
MW 9	19-Feb-91	Surficial Materials
MW 10	19-Feb-91	Surficial Materials
MW 11	19-Feb-91	Upper Sandstone
MW 12A	19-Feb-91	Upper Sandstone
MW 12B	30-Sep-96	Clay Shale
MW 14	22-Jul-92	Upper Sandstone
MW 18A	1-Oct-96	Clay Shale
MW 18B	30-Sep-96	Surficial Materials
MW 19A	1-Oct-96	Clay Shale
MW 19B	1-Oct-96	Surficial Materials
MW 20A	1-Oct-96	Clay Shale
MW 20B	1-Oct-96	Surficial Materials
MW 21A	1-Oct-98	Clay Shale
MW 21B	1-Oct-98	Surficial Materials
MW 22A	1-Oct-98	Clay Shale
MW 22B	1-Oct-98	Surficial Materials
MW 23A	1-Oct-98	Clay Shale
MW 23B	1-Oct-98	Upper Sandstone
MW 24A	13-Aug-04	Clay Shale
MW 24B	13-Aug-04	Surficial Materials

Well Identification	Date Installed	Unit Type
MW 25A	13-Aug-04	Clay Shale
MW 25B	13-Aug-04	Upper Sandstone
MW 26A	13-Aug-04	Clay Shale
MW 26B	13-Aug-04	Upper Sandstone
MW 27A	Oct-07	Clay Shale
MW 27B	Oct-07	Upper Sandstone
MW 28A	4-Oct-12	Clay Shale
MW 28B	4-Oct-12	Upper Sandstone
MW 29A	6-Oct-14	Upper Sandstone
MW 29B	8-Oct-14	Surficial Materials
MW 30A	8-Oct-14	Upper Sandstone
MW 30B	8-Oct-14	Surficial Materials
MW 31A	8-Oct-14	Upper Sandstone
MW 31B	8-Oct-14	Surficial Materials
MW 32A	8-Oct-14	Clay Shale
MW 32B	8-Oct-14	Surficial Materials
MW 33A	6-Oct-14	Upper Sandstone
MW 33B	6-Oct-14	Surficial Materials
15MW34A	21-Jul-15	Clay Shale
15MW34B	21-Jul-15	Surficial Materials
15MW35-Deep	28-Jul-15	Lower Bedrock
15MW35A	28-Jul-15	Clay Shale
15MW35B	28-Jul-15	Upper Sandstone
15MW35C	28-Jul-15	Surficial Materials
15MW36-Deep	21-Jul-15	Lower Bedrock
15MW36A	28-Jul-15	Clay Shale

Notes:

mbgl - metres below ground level

Unit Types

Unit Types
Surficial Materials
Upper Sandstone
Clay Shale
Lower Bedrock

Table 3: Monitoring Well Construction Details - Existing Monitoring Wells

Well	Surface Elevation[1] (m AMSL)	Top of Casing Elevation[1] (m AMSL)	Measured Stick-up (m)	Measured Well Depth			Screened Interval (mbgl)				Sand Pack Interval (mbgl)		Lithology Screened	May 30, 2017 Measured Water Level	
				(m BTOC)	(mbgl)	(m AMSL)	Top Screen Depth	Bottom Screen Depth	Top Screen Elevation (m AMSL)	Bottom Screen Elevation (m AMSL)	Top Sand Depth	Bottom Sand Depth		(m BTOC)	(mbgl)
MW 1B	687.82	688.70	0.87	10.72	9.86	677.98	8.36	9.86	679.46	677.96	8.00	9.86	clay shale	3.53	2.67
MW 1C	687.64	688.61	0.94	6.45	5.51	682.16	4.01	5.51	683.64	682.14	3.70	5.51	clay shale/ sandstone	2.49	1.55
MW 5A	688.28	689.17	0.90	7.64	6.74	681.53	5.24	6.74	683.04	681.54	4.74	6.74	clay shale / sandstone	3.03	2.13
MW 5B	688.25	689.10	0.83	10.52	9.69	678.58	8.19	9.69	680.07	678.57	7.90	9.69	clay shale	4.76	3.93
MW 8A	686.84	687.83	0.98	11.26	10.28	676.57	7.28	10.28	679.56	676.56	6.6	10.28	clay / sand / siltstone	1.54	0.56
MW 8B	686.82	687.69	0.85	5.418	4.57	682.27	3.07	4.57	683.76	682.26	1.8	4.57	clay / sand	1.43	0.58
MW 9	686.97	687.47	0.42	5.35	4.93	682.12	3.43	4.93	683.55	682.05	3.13	4.93	clay till / sandstone	1.45	1.03
MW 10	687.44	687.96	0.38	3.87	3.49	684.09	1.99	3.49	685.45	683.95	1.69	3.49	clay till / clay shale / sandstone	1.31	0.93
MW 11	687.95	688.37	0.42	6.25	5.83	682.12	4.33	5.83	683.61	682.11	4.03	5.83	clay shale / sandstone	1.73	1.32
MW 12A	686.62	687.13	0.39	6.17	5.78	680.96	4.28	5.78	682.34	680.84	3.98	5.78	clay till / clay shale / sandstone	1.20	0.81
MW 12B	687.27	687.78	0.20	10.69	10.49	677.09	8.99	10.49	678.29	676.79	8.69	10.49	clay shale	1.99	1.79
MW 14	686.52	687.56	0.94	7.08	6.14	680.48	4.64	6.14	681.88	680.38	4.34	6.14	clay till / sandstone	1.75	0.82
MW 18A	687.13	687.77	0.64	10.72	10.08	677.05	8.58	10.08	678.56	677.06	8.15	10.08	clay shale	1.93	1.29
MW 18B	687.12	687.85	0.74	6.01	5.27	681.85	2.27	5.27	684.84	681.84	2.10	5.27	clay till / clay shale / sandstone	1.24	0.51
MW 19A	686.60	687.10	0.46	10.72	10.26	676.38	8.76	10.26	677.84	676.34	8.20	10.26	clay shale	0.81	0.35
MW 19B	686.65	687.14	0.50	5.33	4.84	681.81	1.84	4.84	684.81	681.81	1.64	4.84	clay shale / sandstone	0.89	0.39
MW 20A	688.89	689.54	0.60	10.60	10.00	678.94	8.50	10.00	680.39	678.89	8.30	10.00	clay shale / sandstone	3.72	3.12
MW 20B	688.92	689.65	0.71	5.11	4.40	684.55	1.40	4.40	687.53	684.53	1.20	4.40	clay till / clay shale / sandstone	3.38	2.67
MW 21A	687.60	688.30	0.69	10.67	9.98	677.63	8.48	9.98	679.12	677.62	8.18	9.98	clay shale / siltstone	4.98	4.29
MW 21B	687.54	688.55	0.97	6.08	5.11	682.47	2.11	5.11	685.43	682.43	1.81	5.11	clay till / sandstone / siltstone	2.99	2.02
MW 22A	687.83	688.66	0.84	10.66	9.82	678.01	8.32	9.82	679.52	678.02	8.02	9.82	clay shale / sandstone / siltstone	5.03	4.19
MW 22B	687.81	688.70	0.87	6.09	5.22	682.61	2.22	5.22	685.59	682.59	2.22	5.22	clay till / sandstone / clay shale	3.23	2.36
MW 23A	686.45	687.16	0.67	10.66	9.99	676.50	8.49	9.99	677.96	676.46	7.99	9.99	clay shale / sandstone / siltstone	0.98	0.31
MW 23B	686.48	687.38	0.86	5.35	4.50	682.03	1.50	4.50	684.98	681.98	1.30	4.50	sand / sandstone	1.70	0.85
MW 24A	688.88	689.68	0.70	10.50	9.80	679.18	8.30	9.80	680.58	679.08	8.00	9.80	sandstone / siltstone	3.21	2.51
MW 24B	688.86	689.63	0.70	6.07	5.38	683.56	2.38	5.38	686.49	683.49	2.18	5.38	clay till/clay shale	2.49	1.80
MW 25A	686.73	687.54	0.82	10.72	9.90	676.82	8.40	9.90	678.34	676.84	7.90	9.90	clay shale	1.25	0.43
MW 25B	686.91	687.48	0.59	6.10	5.51	681.39	2.51	5.51	684.41	681.41	2.31	5.51	sandstone / clay shale	1.69	1.10
MW 26A	687.00	687.60	0.56	10.73	10.17	676.87	8.67	10.17	678.33	676.83	8.17	10.17	clay shale	2.04	1.48
MW 26B	687.14	687.63	0.49	6.04	5.56	681.58	2.56	5.56	684.58	681.58	2.26	5.56	clay shale / sandstone / siltstone	1.64	1.16
MW 27A	686.65	687.19	0.53	10.97	10.44	676.23	8.94	10.44	677.72	676.22	9.24	10.44	siltstone	0.50	-0.03
MW 27B	686.50	687.15	0.63	6.61	5.98	680.54	2.98	5.98	683.52	680.52	2.68	5.98	sand / siltstone	0.96	0.33
MW 28A	687.36	687.96	0.59	11.77	11.18	676.19	9.68	11.18	677.67	676.17	9.38	11.18	siltstone	2.01	1.42
MW 28B	687.44	687.97	0.52	7.08	6.57	680.89	3.57	6.57	683.87	680.87	3.27	6.57	sand / siltstone	1.85	1.33
MW 29A	688.06	688.89	0.82	10.24	9.42	678.64	7.92	9.42	680.13	678.63	7.42	9.42	sandstone	2.88	2.06
MW 29B	688.13	688.93	0.78	5.45	4.67	683.47	3.17	4.67	684.96	683.46	2.87	4.67	sand	2.92	2.14
MW 30A	688.57	689.37	0.76	8.91	8.15	680.46	6.15	8.15	682.42	680.42	5.85	9.00	sandstone	3.48	2.72
MW 30B	688.52	689.31	0.75	5.45	4.70	683.86	3.20	4.70	685.32	683.82	2.90	4.70	clay till	3.44	2.69
MW 31A	686.38	687.12	0.69	9.75	9.07	677.37	7.07	9.07	679.31	677.31	6.77	9.07	sandstone	2.41	1.73
MW 31B	686.40	687.17	0.73	3.92	3.19	683.25	1.69	3.19	684.71	683.21	1.39	3.19	clay till / sandstone	2.10	1.37
MW 32A	686.53	687.19	0.65	10.12	9.47	677.08	7.47	9.47	679.06	677.06	7.17	9.47	clay	2.25	1.60
MW 32B	686.54	687.23	0.68	4.88	4.20	682.35	2.70	4.20	683.84	682.34	2.40	4.50	clay till / sand	2.31	1.63
MW 33A	686.92	687.93	0.92	14.12	13.20	673.82	11.20	13.20	675.72	673.72	10.90	13.20	sandstone	2.11	1.20
MW 33B	686.94	687.87	0.90	5.51	4.61	682.36	3.11	4.61	683.83	682.33	2.81	4.61	sand / sandstone	1.40	0.50
15MW34A	687.98	689.02	1.05	12.98	11.94	676.04	10.20	11.94	677.78	676.04	9.80	11.94	clay shale	3.40	2.35
15MW34B	687.97	688.96	0.99	5.79	4.80	683.17	3.20	4.80	684.77	683.17	2.80	4.80	clay	2.73	1.74
15MW35-Deep	688.43	689.32	0.85	33.44	32.59	655.88	31.00	32.59	657.43	655.85	29.70	32.59	sandstone	6.64	5.79
15MW35A	688.46	689.32	0.85	14.56	13.71	674.76	11.70	13.71	676.76	674.75	11.50	13.71	clay shale	7.55	6.70
15MW35B	688.47	689.40	0.81	7.98	7.17	681.41	5.50	7.17	682.97	681.30	5.20	7.17	sandstone	4.45	3.64
15MW35C	688.53	689.50	0.94	4.19	3.25	685.31	2.00	3.25	686.53	685.29	1.70	3.25	clay till	Dry	n/a
15MW36-Deep	687.03	687.79	0.74	35.38	34.64	652.41	33.60	34.64	653.43	652.39	33.30	34.64	sandstone	5.78	5.04
15MW36A	687.05	687.95	0.85	15.83	14.98	672.12	12.70	14.98	674.35	672.08	12.40	14.98	clay shale	3.16	2.31

Notes:

[1]Monitoring well network re-surveyed on July 30, 2015

Metres above mean sea level (m AMSL)

Metres below ground level (mbgl)

Metres below top of casing (m BTOC)

Information not available (n/a)

Surficial Materials
Upper Sandstone
Clay Shale
Lower Bedrock

Table 4: Groundwater Elevation Data - Existing Monitoring Wells

Well	Surface Elevation[1] (m AMSL)	Top of Casing Elevation[1] (m AMSL)	Groundwater Elevation (m AMSL)																	
			Apr-91	Oct-91	Apr-92	Oct-92	Apr-93	Oct-93	Apr-94	Oct-94	Apr-95	Oct-95	Apr-96	Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00
MW 1B	687.82	688.70	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	683.71	685.12	685.1	684.21	685.02	684.74	685.06	684.45
MW 1C	687.64	688.61	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 5A	688.28	689.17	685.17	685.44	685.05	685.04	684.77	684.49	684.25	685.03	684.75	684.92	684.17	n/a	685.75	685.97	685.535	685.75	685.76	685.61	685.33
MW 5B	688.25	689.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	678.55	681.14	681.97	682.375	682.05	682.23	681.65	681.93
MW 8A	686.84	687.83	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 8B	686.82	687.69	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 9	686.97	687.47	684.96	684.74	685.21	684.27	684.27	684.35	683.93	684.55	685.01	684.41	684.73	684.74	684.86	684.82	684.63	684.64	684.72	683.47	684.02
MW 10	687.44	687.96	685.4	684.92	dry	dry	dry	dry	dry	685.71	dry	685.66	dry	685.89	686.16	686.06	685.59	685.8	685.91	685.71	dry
MW 11	687.95	688.37	685.62	684.86	685.31	685.41	685.15	685.53	685.36	685.85	685.36	685.8	685.49	685.27	686.53	686.13	685.775	685.95	686.08	685.81	685.37
MW 12A	686.62	687.13	686.07	685.37	685.61	685.7	685.42	684.95	684.76	685.56	685.34	684.99	684.72	685.57	685.80	686.20	685.79	685.99	685.84	685.87	685.51
MW 12B	687.27	687.78	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	678.67	685.22	685.64	685.185	685.41	685.14	685.25	684.89
MW 14	686.52	687.56	n/a	n/a	n/a	684.36	684.78	684.42	684.19	684.61	684.44	684.32	684.07	684.86	685.11	684.64	684.945	684.69	684.99	684.31	684.36
MW 18A	687.13	687.77	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	682.79	686.09	685.73	685.68	684.87	685.65	685.54	685.33
MW 18B	687.12	687.85	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	685.94	685.25	685.59	685.05	685.57	685.35	685.30	684.92
MW 19A	686.60	687.10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	684.79	681.69	680.53	682.29	686.32	685.54	685.83	681.23
MW 19B	686.65	687.14	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	686.34	685.34	686.03	685.33	686.34	685.59	685.81	685.18
MW 20A	688.89	689.54	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	680.20	685.22	686.12	685.515	686.14	685.77	686.07	685.27
MW 20B	688.92	689.65	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	685.79	685.33	686.13	685.51	686.5	685.56	685.96	685.29
MW 21A	687.60	688.30	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	683.54	683.93	683.00	683.72
MW 21B	687.54	688.55	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	686.47	685.67	686.00	685.31
MW 22A	687.83	688.66	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	678.97	685.43	685.55	685.02
MW 22B	687.81	688.70	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	686.29	685.71	685.87	685.32
MW 23A	686.45	687.16	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	681.03	684.27	683.44	683.97
MW 23B	686.48	687.38	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	686.17	frozen	685.66	685.22
MW 24A	688.88	689.68	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 24B	688.86	689.63	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 25A	686.73	687.54	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 25B	686.91	687.48	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 26A	687.00	687.60	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 26B	687.14	687.63	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 27A	686.65	687.19	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 27B	686.50	687.15	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 28A	687.36	687.96	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 28B	687.44	687.97	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 29A	688.06	688.89	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 29B	688.13	688.93	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 30A	688.57	689.37	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 30B	688.52	689.31	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 31A	686.38	687.12	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 31B	686.40	687.17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 32A	686.53	687.19	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 32B	686.54	687.23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 33A	686.92	687.93	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 33B	686.94	687.87	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW34A	687.98	689.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW34B	687.97	688.96	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW35-Deep	688.43	689.32	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW35A	688.46	689.32	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW35B	688.47	689.40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW35C	688.53	689.50	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW36-Deep	687.03	687.79	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW36A	687.05	687.95	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Notes:

[1]Monitoring well network re-surveyed on July 30, 2015
Metres above mean sea level (m AMSL)
Information not available (n/a)
Water levels measured August 6, 2015 after installation

	Surficial Materials
	Upper Sandstone
	Clay Shale
	Lower Bedrock

Table 4: Groundwater Elevation Data - Existing Monitoring Wells

Well	Ground Elevation (m AMSL)	Top of Casing Elevation	Groundwater Elevation (m AMSL)																			
			Oct 2000	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12
MW 1B	687.82	688.70	685.02	685.02	684.53	684.86	684.77	684.55	684.38	684.89	684.58	685.01	684.78	685.36	684.84	685.01	684.91	684.73	684.73	685.02	684.54	685.02	685.02
MW 1C	687.64	688.61	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	685.24
MW 5A	688.28	689.17	686.01	686.01	685.58	685.66	685.07	685.14	684.83	685.49	684.86	685.63	685.37	685.88	685.24	684.84	686.31	685.32	685.32	686.01	685.39	686.01	686.01
MW 5B	688.25	689.10	680.82	680.82	681.89	681.03	681.55	680.74	680.94	681.06	680.89	681.39	682.53	682.41	682.05	681.85	680.66	678.6	678.60	680.82	687.39	680.82	680.82
MW 8A	686.84	687.83	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 8B	686.82	687.69	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 9	686.97	687.47	684.71	684.71	683.92	684.37	683.67	684.23	683.91	684.60	684.19	685.47	684.48	684.83	683.88	684.93	685	685.06	685.06	684.71	bent	684.71	684.71
MW 10	687.44	687.96	685.71	685.71	dry	685.63	dry	685.48	dry	685.74	685.38	685.82	685.95	686.20	685.63	685.98	686.32	686.18	686.18	685.71	685.67	685.71	685.71
MW 11	687.95	688.37	685.96	685.96	685.25	685.77	685.19	685.50	685.25	685.96	684.99	686.13	685.92	685.47	685.37	685.84	686.41	686.38	686.38	685.96	685.68	685.96	685.96
MW 12A	686.62	687.13	686.01	686.01	685.54	685.72	685.33	685.25	685.00	685.60	685.17	685.68	685.68	686.15	685.47	685.94	686.2	686.41	686.41	686.01	685.07	686.01	686.01
MW 12B	687.27	687.78	685.13	685.13	684.92	685.13	684.75	684.75	684.43	685.04	684.67	685.04	685.06	685.53	685.00	685.37	685.03	685.77	685.77	685.13	685.12	685.13	685.13
MW 14	686.52	687.56	684.73	684.73	684.08	684.31	683.73	684.37	684.27	684.70	684.62	684.46	684.53	684.22	683.96	684.58	684.8	684.37	684.37	684.73	685.49	684.73	684.73
MW 18A	687.13	687.77	685.31	685.31	685.30	685.06	685.24	685.00	684.99	685.13	685.36	685.46	685.55	685.73	685.64	685.72	685.83	685.75	685.75	685.31	685.16	685.31	685.31
MW 18B	687.12	687.85	685.43	685.43	684.89	685.26	684.75	684.95	684.49	685.38	685.00	685.48	685.17	685.55	685.17	685.67	685.3	686.01	686.01	685.43	685.40	685.43	685.43
MW 19A	686.60	687.10	681.48	681.48	frozen	685.74	frozen	685.40	681.59	685.58	685.51	686.02	685.75	686.10	685.57	686.22	686.08	686.24	686.24	681.48	685.71	681.48	681.48
MW 19B	686.65	687.14	685.87	685.87	frozen	685.72	685.18	685.33	684.92	685.86	685.48	686.13	685.80	686.11	685.69	686.20	686.13	686.34	686.34	685.87	685.71	685.87	685.87
MW 20A	688.89	689.54	685.91	685.91	685.33	685.87	685.32	685.51	685.03	685.91	685.33	686.12	685.74	686.23	685.62	685.95	686.04	686.51	686.51	685.91	685.35	685.91	685.91
MW 20B	688.92	689.65	686.00	686.00	685.26	685.86	685.22	685.55	684.98	685.92	685.47	686.16	685.77	686.25	685.54	686.35	686.17	686.37	686.37	686.00	685.66	686.00	686.00
MW 21A	687.60	688.30	682.39	682.39	683.37	681.96	682.75	681.40	681.57	680.84	681.48	681.28	683.02	681.84	680.88	681.62	682.1	681.28	681.28	682.39	683.77	682.39	682.39
MW 21B	687.54	688.55	686.04	686.04	685.35	685.88	685.14	685.44	684.97	685.83	685.3	686.06	685.62	686.19	685.49	686.27	686.03	686.36	686.36	686.04	685.71	686.04	686.04
MW 22A	687.83	688.66	685.03	685.03	684.86	684.57	684.42	683.64	683.55	683.31	683.39	683.66	684.28	684.63	683.61	683.81	682.68	683.08	683.08	685.03	684.40	685.03	685.03
MW 22B	687.81	688.70	685.96	685.96	685.36	685.79	685.10	685.30	684.96	685.77	685.31	686.06	685.71	686.17	685.55	686.23	686.18	686.36	686.36	685.96	686.12	685.96	685.96
MW 23A	686.45	687.16	684.00	684.00	684.05	683.53	684.09	683.53	684.10	683.59	684.67	684.58	685.13	685.06	684.69	684.88	684.63	685.17	685.17	684.00	685.65	684.00	684.00
MW 23B	686.48	687.38	685.78	685.78	685.11	685.63	684.93	685.19	684.78	685.59	685.28	686.00	685.62	685.78	683.50	685.92	685.13	686.28	686.28	685.78	685.72	685.78	685.78
MW 24A	688.88	689.68	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	685.98	685.76	686.10	685.67	686.31	686.33	686.66	686.66	685.61	685.96	686.70	686.50
MW 24B	688.86	689.63	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	686.13	685.87	686.30	685.68	686.48	686.30	686.76	686.76	686.21	686.41	687.16	687.02
MW 25A	686.73	687.54	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	684.45	685.60	685.79	685.75	685.51	686.00	686.09	686.09	685.83	686.15	686.68	
MW 25B	686.91	687.48	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	686.16	685.70	686.21	685.53	686.11	686.31	686.62	686.62	685.92	685.96	686.32	686.31
MW 26A	687.00	687.60	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	683.83	684.64	684.35	684.17	683.98	682.33	684.25	684.25	685.56	685.41	685.75	685.79
MW 26B	687.14	687.63	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	686.00	685.52	686.00	685.36	685.99	686.09	686.64	686.64	685.86	685.89	686.31	686.36
MW 27A	686.65	687.19	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	684.92	684.92	685.55	685.13	685.50	686.16
MW 27B	686.50	687.15	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	686.25	686.25	685.26	685.53	686.07	686.79
MW 28A	687.36	687.96	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 28B	687.44	687.97	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 29A	688.06	688.89	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 29B	688.13	688.93	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 30A	688.57	689.37	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 30B	688.52	689.31	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 31A	686.38	687.12	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 31B	686.40	687.17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 32A	686.53	687.19	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 32B	686.54	687.23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 33A	686.92	687.93	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW 33B	686.94	687.87	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW34A	687.98	689.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW34B	687.97	688.96	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW35-Deep	688.43	689.32	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW35A	688.46	689.32	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW35B	688.47	689.40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW35C	688.53	689.50	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW36-Deep	687.03	687.79	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15MW36A	687.05	687.95	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Notes:

[1]Monitoring well network re-surveyed on July 30, 2015

Metres above mean sea level (m AMSL)

Information not available (n/a)

Water levels measured August 6, 2015 after installation

	Surficial Materials
	Upper Sandstone
	Clay Shale
	Lower Bedrock

Table 4: Groundwater Elevation Data - Existing Monitoring Wells

Well	Ground Elevation (m AMSL)	Top of Casing Elevation	Groundwater Elevation (m AMSL)				
			Jun-13	May-14	May-15[1]	May-16	May-17
MW 1B	687.82	688.70	684.98	684.90	685.06	684.83	685.17
MW 1C	687.64	688.61	682.41	685.73	685.62	685.15	686.12
MW 5A	688.28	689.17	685.32	685.11	686.96	685.79	686.14
MW 5B	688.25	689.10	685.87	685.07	684.27	683.48	684.34
MW 8A	686.84	687.83	686.39	685.78	685.96	686.06	686.29
MW 8B	686.82	687.69	686.23	685.39	685.86	686.13	686.27
MW 9	686.97	687.47	685.64	685.14	685.35	685.55	686.02
MW 10	687.44	687.96	686.11	685.76	686.13	685.89	686.64
MW 11	687.95	688.37	686.02	685.89	686.06	685.90	686.64
MW 12A	686.62	687.13	685.59	685.44	685.67	685.40	685.93
MW 12B	687.27	687.78	685.56	685.40	685.57	685.24	685.79
MW 14	686.52	687.56	685.28	685.38	684.86	685.92	685.81
MW 18A	687.13	687.77	685.62	685.63	685.73	685.57	685.84
MW 18B	687.12	687.85	685.97	686.03	685.98	685.80	686.61
MW 19A	686.60	687.10	685.91	686.00	686.04	685.76	686.29
MW 19B	686.65	687.14	685.99	686.05	686.03	685.75	686.25
MW 20A	688.89	689.54	685.67	685.75	686.87	685.55	685.82
MW 20B	688.92	689.65	685.84	685.99	685.88	685.74	686.28
MW 21A	687.60	688.30	683.68	683.29	683.31	684.09	683.33
MW 21B	687.54	688.55	685.62	685.54	685.46	685.27	685.56
MW 22A	687.83	688.66	684.35	683.97	683.90	683.60	683.63
MW 22B	687.81	688.70	685.62	685.56	685.43	685.20	685.47
MW 23A	686.45	687.16	686.15	686.28	686.15	686.13	686.18
MW 23B	686.48	687.38	685.77	685.80	685.71	685.44	685.67
MW 24A	688.88	689.68	686.18	686.14	686.34	686.09	686.47
MW 24B	688.86	689.63	686.78	685.82	686.89	687.08	687.14
MW 25A	686.73	687.54	686.35	686.46	686.39	686.22	686.29
MW 25B	686.91	687.48	686.03	686.13	685.83	685.58	685.80
MW 26A	687.00	687.60	685.78	685.70	685.76	685.51	685.56
MW 26B	687.14	687.63	686.16	686.96	685.94	685.64	685.98
MW 27A	686.65	687.19	685.59	686.87	686.86	686.76	686.69
MW 27B	686.50	687.15	684.38	686.47	686.15	685.98	686.19
MW 28A	687.36	687.96	685.39	685.57	685.78	685.71	685.95
MW 28B	687.44	687.97	685.20	685.38	685.58	685.84	686.13
MW 29A	688.06	688.89	n/a	n/a	684.93	685.98	686.01
MW 29B	688.13	688.93	n/a	n/a	684.95	686.10	686.01
MW 30A	688.57	689.37	n/a	n/a	684.87	685.95	685.90
MW 30B	688.52	689.31	n/a	n/a	684.90	685.80	685.87
MW 31A	686.38	687.12	n/a	n/a	685.07	684.32	684.71
MW 31B	686.40	687.17	n/a	n/a	684.71	684.95	685.07
MW 32A	686.53	687.19	n/a	n/a	684.58	684.87	684.95
MW 32B	686.54	687.23	n/a	n/a	684.68	684.90	684.91
MW 33A	686.92	687.93	n/a	n/a	685.52	685.63	685.82
MW 33B	686.94	687.87	n/a	n/a	686.21	686.27	686.47
15MW34A	687.98	689.02	n/a	n/a	683.59	685.38	685.62
15MW34B	687.97	688.96	n/a	n/a	683.17	685.89	686.23
15MW35-Deep	688.43	689.32	n/a	n/a	682.28	682.44	682.68
15MW35A	688.46	689.32	n/a	n/a	677.64	681.61	681.77
15MW35B	688.47	689.40	n/a	n/a	683.06	684.62	684.95
15MW35C	688.53	689.50	n/a	n/a	685.68	Dry	Dry
15MW36-Deep	687.03	687.79	n/a	n/a	665.02	681.87	682.01
15MW36A	687.05	687.95	n/a	n/a	683.89	683.97	684.78

Notes:

[1]Monitoring well network re-surveyed on July 30, 2015

Metres above mean sea level (m AMSL)

Information not available (n/a)

Water levels measured August 6, 2015 after installation

	Surficial Materials
	Upper Sandstone
	Clay Shale
	Lower Bedrock

Table 5.1A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 1A					
			Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00
Field Measurements								
Field pH	-	-	7.6	7.03	7.58	7.03	7.52	7.2
Routine Water								
pH	-	6.5 - 8.5	7.79	7.72	7.66	7.76	7.80	7.71
Conductivity (EC)	µS/cm	-	5590	6230	5610	6520	6740	5790
Calcium	mg/L	-	122	75	141	132	169	389
Magnesium	mg/L	-	29.3	40.7	42.4	44.1	47.2	94.1
Sodium	mg/L	200	1360	1590	1360	1590	1570	1520
Potassium	mg/L	-	5.87	8.26	7.56	10.8	7.9	17.9
Iron	mg/L	0.3	0.134	0.216	0.514	0.024	0.044	< 0.003
Sulphate	mg/L	500	2510	3330	2950	3460	3330	3490
Chloride	mg/L	250	1.1	<0.5	1.4	0.7	<0.5	<0.5
Bicarbonate	mg/L	-	792	774	767	768	760	781
Carbonate	mg/L	-	n/a	n/a	n/a	n/a	<6	<6
Nitrate	mg/L	10	n/a	<0.05	<0.05	0.16	0.213	<0.04
TDS*	mg/L	500	4410	5430	4880	5620	5510	5700
Water Nutrients								
Ammonia-N	mg/L	-	0.58	0.78	0.45	0.54	0.48	0.63
TKN	mg/L	-	1.24	1.34	0.97	1.2	1.63	1.16
Organics								
COD	mg/L	-	38	63	53	38	36	37
TOC	mg/L	-	14.3	14.5	18.2	15.2	14.4	15
Oil & Grease	mg/L	-	1	1	2	<1	<1	7
Metals								
Antimony	mg/L	0.006	<0.005	<0.005	<0.005	0.007	<0.006	<0.006
Barium	mg/L	1	0.0105	0.0097	0.0128	0.008	0.0068	0.007
Cadmium	mg/L	0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0006	<0.0006
Chromium	mg/L	0.05	<0.0008	0.0014	<0.0008	<0.0008	<0.0009	<0.0009
Cobalt	mg/L	-	<0.0007	0.0035	0.0042	0.0038	0.0056	0.0048
Copper	mg/L	1	<0.001	<0.001	<0.001	0.002	0.608	<0.001
Lead	mg/L	0.010	<0.002	<0.002	<0.002	0.007	0.034	<0.002
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L	-	<0.001	0.003	0.001	0.007	0.006	0.002
Zinc	mg/L	5.0	0.0065	0.0054	0.0088	0.0201	0.11	0.0203

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table 5.1B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 1B					
			May-12	Jun-13	Jun-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.61	6.17	9.9	8.4	6.33	-
Field EC	mS	-	2.47	4.11	2.95	3.05	3.67	-
Field Temperature	°C	-	7.7	8.2	7.5	8.3	n/a	-
Routine Water								
pH	-	6.5 - 8.5	8.44	8.41	8.05	8.24	8.44	8.54
Conductivity (EC)	µS/cm	-	3700	3,200	2800	2900	2700	2900
Calcium	mg/L	-	19	14	12	12	10	12
Magnesium	mg/L	-	2.8	2	1.7	1.6	1.3	1.6
Sodium	mg/L	200	890	730	740	740	680	670
Potassium	mg/L	-	3.6	2.6	2.5	2.4	2.1	2.2
Iron	mg/L	0.3	<0.060	<0.060	0.64	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1200	860	680	680	540	610
Chloride	mg/L	250	4.8	5.2	5.1	6.1	6.1	6.2
Bicarbonate	mg/L	-	1000	1,000	1100	1100	1100	1000
Carbonate	mg/L	-	15	16	<0.50	<0.50	13	21
Nitrate (N)	mg/L	10	5	5.3	3.7	0.89	1.1	13
TDS*	mg/L	500	2700	2,200	2000	2000	1800	1800
Water Nutrients								
Ammonia-N	mg/L	-	0.47	0.36	<0.050	0.26	0.36	-
TKN	mg/L	-	2.8	2.4	2.2*	1.6	0.96	-
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10) - BTEX	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.75	<0.10	<0.10	<0.10	<0.10	<0.27
Organics								
COD	mg/L	-	120	270	98	120	47	-
DOC	mg/L	-	13	11	9.9	10	8.8	11
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0044	0.061	0.059
Antimony	mg/L	0.006	<0.00060	0.00064	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.0012	0.0015	0.00098
Barium	mg/L	1	0.015	0.017	0.039	0.017	0.021	0.024
Boron	mg/L	5	n/a	n/a	n/a	0.63	0.62	0.64
Cadmium	mg/L	0.005	0.000038	0.000057	<0.000025	0.000029	0.000029	0.000022
Chromium	mg/L	0.05	<0.0010	<0.0010	0.0034	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00066	0.00068	0.001	0.00058	0.00083	0.00099
Copper	mg/L	1	0.0008	0.0032	0.0057	0.0020	0.0035	0.0018
Lead	mg/L	0.010	<0.00020	<0.00020	0.00056	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.10	0.057	0.095
Mercury	mg/L	0.001	<3E n/a 06	<3E n/a 07	0.00003	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0095	0.011	0.0085	0.0082	0.0084	0.0075
Nickel	mg/L	-	0.004	0.0053	0.0068	0.0038	0.0060	0.0056
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.00020	0.00058	0.00035
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0019	0.0022	0.0020
Zinc	mg/L	5	<0.0030	0.0078	0.0034	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.645
Volume Purged (L)	22 (dry)
Sampling Date	6-Jun-17
Static Water Level	3.530

Table 5.1C: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 1C					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	6.1	5.41	8.0	8.2	6.43	7.6
Field EC	mS	-	19.99	7.03	6.1	6.42	7.54	7.27
Field Temperature	°C	-	10	6.4	6.7	6.6	8.1	9.7
Routine Water								
pH	-	6.5 - 8.5	8.11	8.26	8.08	7.98	8.18	8.23
Conductivity (EC)	µS/cm	-	5800	5900	5900	6100	6100	6100
Calcium	mg/L	-	130	130	130	140	140	150
Magnesium	mg/L	-	34	34	33	34	36	38
Sodium	mg/L	200	1400	1300	1300	1400	1300	1400
Potassium	mg/L	-	6.7	6.2	4.8	6.6	6.9	7.1
Iron	mg/L	0.3	<0.060	0.095	<0.60	<0.060	<0.060	<0.6
Sulphate	mg/L	500	2600	2800	3000	2900	2800	2600
Chloride	mg/L	250	1.8	1.3	1.1	1.7	1.4	<1
Bicarbonate	mg/L	-	760	760	770	750	710	760
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	0.0078	0.25	0.093	0.080	0.22	0.41
TDS*	mg/L	500	4600	4600	4800	4800	4700	4600
Water Nutrients								
Ammonia-N	mg/L	-	0.66	0.57	0.57	0.60	0.46	0.7
TKN	mg/L	-	1.3	1.2	1.2	1.2	0.58	1.1
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.0008
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Organics								
COD	mg/L	-	56	46	39	42	51	28
DOC	mg/L	-	10	12	9.6	11	11	10
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.030	0.0079	0.0069
Antimony	mg/L	0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.01	n/a	n/a	n/a	<0.0020	0.0011	0.00068
Barium	mg/L	1	0.037	0.035	<0.10	0.025	0.023	<0.1
Boron	mg/L	5	n/a	n/a	n/a	0.24	0.24	0.24
Cadmium	mg/L	0.005	<0.050	0.000065	<0.000050	<0.00020	0.000036	<0.00002
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.001
Cobalt	mg/L	-	<0.0030	<0.0030	<0.0030	<0.0030	0.00087	0.00067
Copper	mg/L	1	<0.0020	<0.0020	<0.0020	<0.0020	0.00070	0.00039
Lead	mg/L	0.010	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.0002
Manganese	mg/L	0.05	n/a	n/a	n/a	0.27	0.28	0.28
Mercury	mg/L	0.001	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	<0.0020	0.002	<0.0020	<0.0020	0.0013	0.00068
Nickel	mg/L	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0021	0.0013
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0020	<0.00020	<0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	<0.0010	0.00036	0.00022
Zinc	mg/L	5	<0.030	0.074	<0.030	<0.030	0.0037	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	6.448
Volume Purged (L)	13 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.492

Table 5.5A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 5A					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.35	6.41	7.8	7.8	6.15	8.4
Field EC	mS	-	3.86	1.03	9.71	10.05	12.74	2.05
Field Temperature	°C	-	8.3	6.5	6.0	7.1	n/a	8.2
Routine Water								
pH	-	6.5 - 8.5	7.97	8.11	8.18	7.83	8.00	7.99
Conductivity (EC)	µS/cm	-	8800	9200	9200	9500	9600	9600
Calcium	mg/L	-	220	230	260	250	270	290
Magnesium	mg/L	-	73	77	95	100	95	100
Sodium	mg/L	200	2300	2100	2400	2300	2100	2200
Potassium	mg/L	-	10	9.1	10	10	11	10
Iron	mg/L	0.3	<0.060	<0.06	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	5000	5200	5500	5500	5200	4900
Chloride	mg/L	250	2.4	1.7	2.6	2.4	2.1	2.6
Bicarbonate	mg/L	-	730	740	740	730	660	720
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.34	0.46	0.3	0.058	0.20	1.7
TDS*	mg/L	500	7900	7900	8600	8500	8000	7900
Water Nutrients								
Ammonia-N	mg/L		0.59	0.55	0.52	1.0	0.67	0.22
TKN	mg/L	-	1.7	1.5	1.6	2.2	1.3	1.2
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	69	75	63	71	64	59
DOC	mg/L	-	23	25	21	28	24	24
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.030	<0.0030	0.016
Antimony	mg/L	0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	<0.0020	0.00058	0.00047
Barium	mg/L	1	<0.010	<0.010	<0.10	<0.10	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	0.60	0.56	0.57
Cadmium	mg/L	0.005	<0.050	<0.000050	<0.000050	<0.00020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	<0.0030	<0.0030	<0.0030	0.00086	0.00059
Copper	mg/L	1	<0.0020	<0.0020	<0.0020	<0.0020	0.0057	0.0008
Lead	mg/L	0.010	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.15	0.15	0.69
Mercury	mg/L	0.001	0.000004	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.0020	<0.0020	<0.0020	<0.0020	0.00080	0.00088
Nickel	mg/L	-	<0.0050	<0.0050	<0.0050	0.0065	0.0086	0.0045
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	<0.0010	0.00031	0.00046
Zinc	mg/L	5	<0.030	<0.030	<0.030	<0.030	0.0033	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	7.68
Volume Purged (L)	25 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	3.031

Table 5.5B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 5B					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.91	6.9	8.3	8.3	-	-
Field EC	mS	-	2.65	2.53	2.43	2.89	-	-
Field Temperature	°C	-	12.5	10.7	10.0	9.3	-	-
Routine Water								
pH	-	6.5 - 8.5	8.01	8.37	8.56	8.28	8.34	9.09
Conductivity (EC)	µS/cm	-	2200	2200	2700	2700	3000	2300
Calcium	mg/L	-	67	61	23	13	13	8.2
Magnesium	mg/L	-	25	26	11	16	3.2	3.4
Sodium	mg/L	200	430	390	570	600	750	520
Potassium	mg/L	-	2.8	2.6	3.7	3.6	4.2	13
Iron	mg/L	0.3	<0.060	<0.060	0.13	<0.060	<0.060	<0.060
Sulphate	mg/L	500	600	560	630	600	650	440
Chloride	mg/L	250	61	45	30	24	16	17
Bicarbonate	mg/L	-	660	690	950	1000	1200	790
Carbonate	mg/L	-	<0.50	9	36	<0.50	5	80
Nitrate (N)	mg/L	10	0.43	0.29	0.93	1.1	0.36	1.7
TDS*	mg/L	500	1500	1400	1800	1800	2000	1500
Water Nutrients								
Ammonia-N	mg/L	-	0.29	0.2	0.36	0.50	0.10	0.32
TKN	mg/L	-	0.87	0.65	1.1	1.4	0.49	0.93
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	39	25	52	56	23	48
DOC	mg/L	-	4.7	3.9	5.2	6.1	7.2	7.7
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0049	0.0062	0.031
Antimony	mg/L	0.006	0.00074	0.00075	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.00068	0.00094	0.002
Barium	mg/L	1	0.034	0.022	0.027	0.016	0.018	0.035
Boron	mg/L	5	n/a	n/a	n/a	0.53	0.84	0.44
Cadmium	mg/L	0.005	0.000095	0.000053	<0.000025	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	0.01	0.011	0.0082	0.010	0.0012
Cobalt	mg/L	-	0.00065	0.0003	<0.0003	<0.00030	0.00040	<0.00030
Copper	mg/L	1	0.0026	0.0051	0.0033	0.0015	0.0033	0.0034
Lead	mg/L	0.010	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.024	0.026	<0.0040
Mercury	mg/L	0.001	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	0.0059	0.0037	0.0061	0.0059	0.010	0.011
Nickel	mg/L	-	0.021	0.013	0.0077	0.0077	0.013	0.0073
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.00020	<0.00020	0.00029
Uranium	mg/L	0.02	n/a	n/a	n/a	0.011	0.0041	0.0032
Zinc	mg/L	5	0.01	0.01	0.0033	<0.0030	0.0033	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.425
Volume Purged (L)	10 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	4.755

Table 5.8A: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 8A				
			1-Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	7.14	8.5	8.5	8.51	8.5
Field EC	mS	-	4.92	2.56	2.91	2.51	2.67
Field Temperature	°C	-	6.1	5.4	6.0	8.7	8.4
Routine Water							
pH	-	6.5 - 8.5	8.45	8.67	8.32	8.49	8.49
Conductivity (EC)	µS/cm	-	4100	2400	2700	2400	2500
Calcium	mg/L	-	25	7.7	7.6	7.8	8.3
Magnesium	mg/L	-	7.3	1.7	1.5	1.3	1.3
Sodium	mg/L	200	930	610	670	600	630
Potassium	mg/L	-	3.7	2.2	2.1	2.3	2.4
Iron	mg/L	0.3	<0.060	0.31	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1300	300	450	290	360
Chloride	mg/L	250	9.8	8.0	7.6	7.4	7.1
Bicarbonate	mg/L	-	1200	1300	1300	1200	1300
Carbonate	mg/L	-	26	49	3.0	25	21
Nitrate (N)	mg/L	10	0.017	<0.010	<0.010	<0.010	<0.044
TDS*	mg/L	500	2900	1600	1800	1500	1700
Water Nutrients							
Ammonia-N	mg/L	-	1.1	0.89	0.96	0.81	0.63
TKN	mg/L	-	1.9	1.5	1.6	1.1	1.3
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	79	68	71	36	40
DOC	mg/L	-	11	9	10	11	12
Metals							
Aluminum	mg/L	0.1	n/a	n/a	0.0043	0.0093	0.0088
Antimony	mg/L	0.006	0.00081	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	0.0014	0.0021	0.0019
Barium	mg/L	1	0.04	0.041	0.025	0.045	0.049
Boron	mg/L	5	n/a	n/a	0.68	0.72	0.77
Cadmium	mg/L	0.005	0.000035	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0012	0.0014	0.00033	0.00046	0.00032
Copper	mg/L	1	0.0017	0.00047	0.00064	0.00042	<0.00020
Lead	mg/L	0.01	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.017	0.015	0.025
Mercury	mg/L	0.001	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.012	0.00036	0.0057	0.0070	0.0062
Nickel	mg/L	-	0.005	0.0023	0.0020	0.0023	0.0011
Selenium	mg/L	0.05	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	0.00071	0.00092	0.00074
Zinc	mg/L	5	0.012	0.007	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.125
Volume Purged (L)	52 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	1.537

Table 5.8B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 8B				
			Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	6.57	7.6	8	7.73	7.8
Field EC	mS	-	10.05	8.96	9.28	8.94	9.25
Field Temperature	°C	-	7.4	4.0	6.6	6.8	5.8
Routine Water							
pH	-	6.5 - 8.5	8.31	8.37	7.95	8.19	8.17
Conductivity (EC)	µS/cm	-	8800	8500	8700	8700	8800
Calcium	mg/L	-	92	110	90	97	97
Magnesium	mg/L	-	48	62	56	54	57
Sodium	mg/L	200	2100	2300	2200	2000	2100
Potassium	mg/L	-	5.8	5.4	6.2	6.7	6.7
Iron	mg/L	0.3	<0.060	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	4300	4500	4200	3900	3900
Chloride	mg/L	250	23	23	26	28	30
Bicarbonate	mg/L	-	1100	1100	1100	1100	1100
Carbonate	mg/L	-	7.2	18	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.022	0.074	0.12	0.10	1.5
TDS*	mg/L	500	7100	7600	7100	6600	6800
Water Nutrients							
Ammonia-N	mg/L	-	0.61	0.57	0.69	0.62	0.38
TKN	mg/L	-	1.7	1.4	1.6	1.3	1.3
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	75	39	48	47	44
DOC	mg/L	-	13	13	14	15	16
Metals							
Aluminum	mg/L	0.1	n/a	n/a	<0.030	0.0050	0.0600
Antimony	mg/L	0.006	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	0.0021	0.0015	0.0013
Barium	mg/L	1	0.025	<0.10	<0.10	0.013	<0.10
Boron	mg/L	5	n/a	n/a	0.41	0.41	0.40
Cadmium	mg/L	0.005	0.000096	<0.000050	<0.00020	0.00003	<0.000020
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	<0.0030	<0.0030	0.0011	0.00095
Copper	mg/L	1	<0.0020	0.0031	<0.0020	0.00034	0.00039
Lead	mg/L	0.01	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.18	0.18	0.180
Mercury	mg/L	0.001	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0021	0.0023	<0.0020	0.0016	0.0013
Nickel	mg/L	-	0.0052	0.006	<0.0050	0.0035	0.0027
Selenium	mg/L	0.05	n/a	n/a	<0.0020	<0.00020	0.00025
Uranium	mg/L	0.02	n/a	n/a	0.0022	0.0024	0.0022
Zinc	mg/L	5	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	5.4
Volume Purged (L)	24 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	1.425

Table 5.9: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 9				
			Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	6.17	7.7	7.9	7.59	7.7
Field EC	mS	-	8.86	8.1	8.26	8.32	6.59
Field Temperature	°C	-	7.2	5.3	5.5	8.0	6.5
Routine Water							
pH	-	6.5 - 8.5	8.21	8.27	7.81	7.96	7.88
Conductivity (EC)	µS/cm	-	7700	7800	7800	7800	6400
Calcium	mg/L	-	110	120	110	120	79
Magnesium	mg/L	-	59	66	56	66	46
Sodium	mg/L	200	1800	1800	1900	1900	1200
Potassium	mg/L	-	14	15	15	15	12
Iron	mg/L	0.3	0.33	<0.60	<0.060	<0.60	<0.060
Sulphate	mg/L	500	3900	4000	3800	4000	2800
Chloride	mg/L	250	1.9	2.1	1.6	1.2	69
Bicarbonate	mg/L	-	1100	1100	1100	1100	920
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.11	0.079	0.17	0.081	1.8
TDS*	mg/L	500	6400	6600	6400	6500	4700
Water Nutrients		-					
Ammonia-N	mg/L		0.85	0.81	0.53	0.32	0.23
TKN	mg/L	-	1.4	1.6	1.3	0.77	2.4
Hydrocarbons		-					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics		-					
COD	mg/L	-	46	42	62	21	110
DOC	mg/L	-	7.8	5.5	6.9	5.9	23
Metals		-					
Aluminum	mg/L	0.1	n/a	n/a	<0.030	0.011	0.0038
Antimony	mg/L	0.006	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	<0.0020	0.00036	0.00093
Barium	mg/L	1	0.014	<0.10	0.010	<0.10	0.046
Boron	mg/L	5	n/a	n/a	0.29	0.31	0.28
Cadmium	mg/L	0.005	0.000051	<0.000050	<0.00020	<0.000020	0.000053
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	0.003	<0.0030	0.00069	0.0016
Copper	mg/L	1	<0.0020	<0.0020	<0.0020	0.0013	0.0042
Lead	mg/L	0.01	<0.0020	<0.0020	<0.0020	0.00027	0.0003
Manganese	mg/L	0.05	n/a	n/a	0.22	0.21	0.37
Mercury	mg/L	0.001	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0023	0.0033	0.0022	0.0017	0.072
Nickel	mg/L	-	<0.0050	0.0061	<0.0050	0.0020	0.013
Selenium	mg/L	0.05	n/a	n/a	<0.0020	0.00023	0.0021
Uranium	mg/L	0.02	n/a	n/a	0.0037	0.004	0.0056
Zinc	mg/L	5	<0.030	<0.030	<0.030	0.0034	0.0094

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	5.37
Volume Purged (L)	12 (Dry)
Sampling Date	7-Jun-17
Static Water Level (mbtoc)	1.453

Table 5.10: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 10					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.69	7.77	8.3	8.3	8.06	8.0
Field EC	mS	-	2.03	4.52	4.92	4.98	4.42	4.26
Field Temperature	°C	-	8.6	11.5	4.2	7.5	9.8	10.3
Routine Water								
pH	-	6.5 - 8.5	8.1	8.33	8.12	7.79	8.26	8.11
Conductivity (EC)	µS/cm	-	4900	4600	4600	4700	4500	4100
Calcium	mg/L	-	91	83	68	140	60	71
Magnesium	mg/L	-	33	34	35	44	31	32
Sodium	mg/L	200	1200	1100	990	910	840	870
Potassium	mg/L	-	5	4.4	4	4.5	4.4	4.2
Iron	mg/L	0.3	<0.060	<0.060	<0.060	8.3	<0.060	<0.060
Sulphate	mg/L	500	2200	2200	2100	1900	1700	1600
Chloride	mg/L	250	25	23	26	140	60	59
Bicarbonate	mg/L	-	600	580	600	590	620	630
Carbonate	mg/L	-	<0.50	4.6	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.019	0.13	0.079	0.014	0.04	3.0
TDS*	mg/L	500	3900	3700	3500	3400	3000	3000
Water Nutrients		-						
Ammonia-N	mg/L		0.31	0.094	0.17	0.23	0.16	0.052
TKN	mg/L	-	0.86	0.69	0.68	0.68	0.57	0.49
Hydrocarbons		-						
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	33	43	33	35	32	24
DOC	mg/L	-	10	11	9.6	11	9.7	8
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.0030	0.0091	<0.0030
Antimony	mg/L	0.006	<0.0030	0.00073	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.00049	0.0006	0.00042
Barium	mg/L	1	0.015	0.015	0.016	0.087	0.023	0.023
Boron	mg/L	5	n/a	n/a	n/a	0.11	0.12	0.13
Cadmium	mg/L	0.005	0.000047	0.000045	<0.000025	0.000049	0.000023	0.000021
Chromium	mg/L	0.05	<0.0050	<0.0010	0.0014	<0.0010	0.0021	0.0018
Cobalt	mg/L	-	<0.0015	0.00059	0.00042	0.014	0.00057	0.00045
Copper	mg/L	1	0.0012	0.0025	0.17	0.0079	0.0035	0.0033
Lead	mg/L	0.01	<0.0010	<0.00020	0.009	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	1.8	0.094	0.076
Mercury	mg/L	0.001	0.0000056	<0.000010	<0.0000050	<0.0000050	0.0000034	<0.0000020
Molybdenum	mg/L	-	0.0012	0.0015	0.0022	0.0017	0.0038	0.0022
Nickel	mg/L	-	0.0094	0.0088	0.0078	1.5	0.059	0.033
Selenium	mg/L	0.05	n/a	n/a	n/a	0.0003	0.00052	0.00053
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0048	0.0093	0.0086
Zinc	mg/L	5	0.018	0.0063	0.11	0.0038	0.0065	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	3.87
Volume Purged (L)	8 (Dry)
Sampling Date	7-Jun-17
Static Water Level (mbtoc)	1.312

Table 5.11: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 11					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.41	7.31	7.5	7.8	7.61	7.7
Field EC	mS	-	4.31	9.67	10.02	10.14	9.90	9.71
Field Temperature	°C	-	8.8	10.5	6.2	6.4	8.6	7.4
Routine Water								
pH	-	6.5 - 8.5	7.98	8.06	8.19	7.79	8.03	7.88
Conductivity (EC)	µS/cm	-	9900	9300	9500	9500	9600	9100
Calcium	mg/L	-	240	220	240	210	230	200
Magnesium	mg/L	-	130	110	130	110	120	120
Sodium	mg/L	200	2600	2100	2300	2200	2100	2100
Potassium	mg/L	-	9.1	7.1	7.6	8.4	9.1	8
Iron	mg/L	0.3	<0.060	<0.060	<0.60	<0.060	<0.060	<0.60
Sulphate	mg/L	500	5600	5400	5600	5100	4800	4500
Chloride	mg/L	250	14	14	14	20	32	37
Bicarbonate	mg/L	-	880	890	840	900	930	1000
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.27	0.37	0.27	0.19	0.23	0.71
TDS*	mg/L	500	9000	8300	8800	8200	7800	7500
Water Nutrients								
Ammonia-N	mg/L		0.14	0.081	0.14	0.17	0.15	0.086
TKN	mg/L	-	1.8	1.5	1.7	1.7	0.81	1.5
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	100	95	96	100	100	84
DOC	mg/L	-	36	33	29	34	36	31
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.030	0.0060	<0.0030
Antimony	mg/L	0.006	<0.0060	0.001	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	<0.0020	0.0011	0.0011
Barium	mg/L	1	<0.010	<0.010	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	0.19	0.20	<0.20
Cadmium	mg/L	0.005	0.000055	0.000084	<0.000050	<0.00020	0.000024	0.000029
Chromium	mg/L	0.05	<0.010	<0.0010	<0.010	<0.010	0.0011	<0.0010
Cobalt	mg/L	-	<0.0030	<0.00030	<0.0030	<0.0030	<0.00030	<0.00030
Copper	mg/L	1	0.0032	0.0031	0.0024	<0.0020	0.0025	0.0025
Lead	mg/L	0.01	<0.0020	<0.00020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.015	0.0081	<0.040
Mercury	mg/L	0.001	0.0000038	<0.000010	<0.0000050	<0.0000050	0.0000022	<0.0000020
Molybdenum	mg/L	-	<0.0020	0.0017	<0.0020	<0.0020	0.0009	0.0011
Nickel	mg/L	-	0.0064	0.0062	0.006	0.0058	0.0060	0.0055
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0020	0.0011	0.00079
Uranium	mg/L	0.02	n/a	n/a	n/a	0.024	0.030	0.030
Zinc	mg/L	5	<0.030	0.0098	<0.030	<0.030	0.0077	0.0044

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	6.254
Volume Purged (L)	19 (dry)
Sampling Date	7-Jun-17
Static Water Level (mbtoc)	1.733

Table 5.12A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 12A					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.33	6	7.8	7.6	6.15	7.5
Field EC	mS	-	4.75	13.32	11.38	11.13	15.40	11.64
Field Temperature	°C	-	6.1	6.2	8.7	5.7	n/a	7.7
Routine Water								
pH	-	6.5 - 8.5	8	8.15	8.25	7.75	8.00	8.02
Conductivity (EC)	µS/cm	-	11000	11000	11,000	11,000	11,000	11,000
Calcium	mg/L	-	140	130	150	120	150	160
Magnesium	mg/L	-	71	72	86	64	82	90
Sodium	mg/L	200	3000	2700	3000	2600	2600	2800
Potassium	mg/L	-	11	9.7	10	10	11	10
Iron	mg/L	0.3	<0.060	<0.060	<0.60	0.75	<0.060	<0.6
Sulphate	mg/L	500	5900	6100	6700	5600	6300	5600
Chloride	mg/L	250	1.8	1.8	1.9	2.2	1.6	1.3
Bicarbonate	mg/L	-	860	910	900	900	880	950
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.095	0.15	0.11	0.082	0.082	0.87
Nitrite (N)	mg/L	1	n/a	n/a	n/a	0.05	0.04	<0.16
Nitrate and Nitrate (N)	mg/L	-	n/a	n/a	n/a	0.13	0.12	0.2
TDS*	mg/L	500	9500	9600	10,000	8900	9600	9200
Water Nutrients								
Ammonia-N	mg/L	-	0.46	0.27	0.26	0.38	0.21	0.067
TKN	mg/L	-	1.2	0.87	0.89	1.3	0.45	0.7
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	61	53	41	68	48	40
DOC	mg/L	-	15	14	15	16	17	16
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.19	0.0087	<0.0030
Antimony	mg/L	0.006	<0.012	0.00074	<0.0060	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	<0.0040	0.00097	0.00078
Barium	mg/L	1	<0.010	<0.010	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	0.44	0.42	0.46
Cadmium	mg/L	0.005	<0.10	<0.0001	<0.000050	<0.00040	0.000042	0.000022
Chromium	mg/L	0.05	<0.020	<0.020	<0.010	<0.020	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0060	<0.0060	<0.0030	<0.0060	0.00048	0.00072
Copper	mg/L	1	<0.0040	<0.0040	<0.0020	<0.0040	0.0028	0.00074
Lead	mg/L	0.01	<0.0040	<0.0040	<0.0020	<0.0040	0.00022	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.087	0.055	<0.040
Mercury	mg/L	0.001	0.0000062	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.0040	<0.0040	<0.0020	<0.0040	0.00071	0.00076
Nickel	mg/L	-	<0.010	<0.010	<0.0050	<0.010	0.0035	0.007
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0040	0.00023	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	<0.0020	0.0021	0.0023
Zinc	mg/L	5	<0.060	<0.060	<0.030	<0.060	0.010	0.0042
Polycyclic Aromatic Hydrocarbons (PAHs)								
Benzo[a]pyrene equivalency	mg/L	-	n/a	n/a	n/a	<0.000010	n/a	n/a
2-methylnaphthalene	mg/L	-	n/a	n/a	n/a	<0.00010	n/a	n/a
Acenaphthene	mg/L	-	n/a	n/a	n/a	<0.00010	n/a	n/a
Acenaphthylene	mg/L	-	n/a	n/a	n/a	<0.00010	n/a	n/a
Acridine	mg/L	-	n/a	n/a	n/a	<0.00020	n/a	n/a
Anthracene	mg/L	-	n/a	n/a	n/a	<0.000010	n/a	n/a
Benz(a)anthracene	mg/L	-	n/a	n/a	n/a	<0.0000085	n/a	n/a
Benzo(a) pyrene	mg/L	0.00001	n/a	n/a	n/a	<0.0000075	n/a	n/a
Benzo(b+j)fluoranthene	mg/L	-	n/a	n/a	n/a	<0.0000085	n/a	n/a
Benzo(c)phenanthrene	mg/L	-	n/a	n/a	n/a	<0.000050	n/a	n/a
Benzo(e)pyrene	mg/L	-	n/a	n/a	n/a	<0.000050	n/a	n/a
Benzo(g,h,i)perylene	mg/L	-	n/a	n/a	n/a	<0.0000085	n/a	n/a
Benzo(k)fluoranthene	mg/L	-	n/a	n/a	n/a	<0.0000085	n/a	n/a
Chrysene	mg/L	-	n/a	n/a	n/a	<0.0000085	n/a	n/a
Dibenz(a,h)anthracene	mg/L	-	n/a	n/a	n/a	<0.0000075	n/a	n/a
Fluoranthene	mg/L	-	n/a	n/a	n/a	<0.000010	n/a	n/a
Fluorene	mg/L	-	n/a	n/a	n/a	<0.000050	n/a	n/a
Indeno(1,2,3-c,d)pyrene	mg/L	-	n/a	n/a	n/a	<0.0000085	n/a	n/a
Naphthalene	mg/L	-	n/a	n/a	n/a	<0.00010	n/a	n/a
Perylene	mg/L	-	n/a	n/a	n/a	<0.000050	n/a	n/a
Phenanthrene	mg/L	-	n/a	n/a	n/a	<0.000050	n/a	n/a
Pyrene	mg/L	-	n/a	n/a	n/a	<0.000020	n/a	n/a
Quinoline	mg/L	-	n/a	n/a	n/a	<0.00020	n/a	n/a

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	6.172
Volume Purged (L)	30 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	1.198

Table 5.12B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 12B					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.52	6.17	7.3	7.7	6.28	7.4
Field EC	mS	-	4.29	11.90	11.87	11.50	13.83	11.5
Field Temperature	°C	-	7.5	7.1	6.9	7.5	n/a	6.3
Routine Water								
pH	-	6.5 - 8.5	7.97	8.14	8.17	7.71	8.00	7.87
Conductivity (EC)	µS/cm	-	9700	10,000	11,000	11,000	11,000	11000
Calcium	mg/L	-	160	210	380	260	270	280
Magnesium	mg/L	-	29	37	78	60	54	63
Sodium	mg/L	200	2500	2400	3400	2800	2500	2600
Potassium	mg/L	-	8	8.2	11	10	11	9.3
Iron	mg/L	0.3	<0.060	<0.060	<0.60	<0.60	0.13	<0.6
Sulphate	mg/L	500	5300	5600	6800	6100	5600	5300
Chloride	mg/L	250	4	3.7	6.2	5.6	6.0	4.6
Bicarbonate	mg/L	-	760	790	870	850	820	860
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	1.8	0.58	0.2	0.12	0.19	<0.22
TDS*	mg/L	500	8400	8700	11,000	9700	8900	8600
Water Nutrients								
Ammonia-N	mg/L	-	1.6	1.7	2.1	2.2	2.1	1.7
TKN	mg/L	-	2.2	2.7	3.3	3.4	2.8	2.8
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	37	56	71	61	71	52
DOC	mg/L	-	14	20	21	22	24	21
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.060	<0.0030	0.0037
Antimony	mg/L	0.006	<0.0060	0.00084	<0.0060	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	<0.0040	0.00088	0.00067
Barium	mg/L	1	<0.010	<0.010	<0.10	<0.10	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	0.56	0.57	0.55
Cadmium	mg/L	0.005	<0.050	<0.00010	<0.000050	<0.00040	0.000027	<0.000020
Chromium	mg/L	0.05	<0.010	<0.020	<0.010	<0.020	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	<0.0060	<0.0030	<0.0060	0.00050	0.00034
Copper	mg/L	1	0.0028	<0.0040	<0.0020	<0.0040	0.0023	0.0015
Lead	mg/L	0.01	<0.0020	<0.0040	<0.0020	<0.0040	0.00021	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.43	0.36	0.42
Mercury	mg/L	0.001	<0.0000021	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.0020	<0.0040	<0.0020	<0.0040	0.00077	0.00052
Nickel	mg/L	-	<0.0050	<0.010	<0.0050	<0.010	0.0030	0.0012
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0040	0.00029	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	0.019	0.021	0.025
Zinc	mg/L	5	0.037	<0.060	<0.030	<0.060	0.0061	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.686
Volume Purged (L)	26 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	10.686

Table 5.14: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 14					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.4	6	7.5	7.8	7.61	7.6
Field EC	mS	-	1.47	4.05	3.81	4.30	4.73	4.8
Field Temperature	°C	-	7.5	9.4	5.6	7.0	8.5	7.4
Routine Water								
pH	-	6.5 - 8.5	8.04	8.13	8.14	7.78	8.05	7.9
Conductivity (EC)	µS/cm	-	3300	3400	3500	4000	4600	4700
Calcium	mg/L	-	160	150	160	190	230	230
Magnesium	mg/L	-	130	130	130	140	190	200
Sodium	mg/L	200	580	490	550	630	690	730
Potassium	mg/L	-	22	22	21	22	25	25
Iron	mg/L	0.3	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1000	1100	1300	1500	1900	1900
Chloride	mg/L	250	2.5	2.1	2.7	1.7	1.6	1.5
Bicarbonate	mg/L	-	1200	1200	1200	1200	1100	1200
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	0.024	0.082	0.09	0.091	0.19	7.8
TDS*	mg/L	500	2500	2500	2700	3100	3600	3700
Water Nutrients								
Ammonia-N	mg/L	-	0.4	0.37	0.37	0.53	0.35	0.2
TKN	mg/L	-	1.1	1	1.1	1.1	0.91	0.8
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	37	52	37	34	34	25
DOC	mg/L	-	9.8	9.7	8.6	9.6	11	8.2
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.00077	0.00069	0.00054
Barium	mg/L	1	0.1	0.087	0.066	0.052	0.042	0.040
Boron	mg/L	5	n/a	n/a	n/a	0.12	0.13	0.14
Cadmium	mg/L	0.005	<0.	0.000068	0.00003	<0.000020	0.000025	0.000029
Chromium	mg/L	0.05	<0.025	<0.0010	<0.001	<0.0010	<0.0010	<0.001
Cobalt	mg/L	-	0.0021	0.002	0.0018	0.0017	0.0019	0.0018
Copper	mg/L	1	<0.0010	0.0014	0.00087	<0.00020	0.00045	0.00084
Lead	mg/L	0.01	<0.0010	0.0005	<0.0002	<0.00020	<0.00020	<0.0002
Manganese	mg/L	0.05	n/a	n/a	n/a	0.62	0.63	0.57
Mercury	mg/L	0.001	0.0000049	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	<0.0010	0.0008	0.0016	0.00068	0.00074	0.00059
Nickel	mg/L	-	0.0042	0.0047	0.0044	0.0033	0.0031	0.0031
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.00020	<0.00020	<0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0008	0.0011	0.00075
Zinc	mg/L	5	<0.015	0.01	0.0059	<0.0030	<0.0030	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	7.085
Volume Purged (L)	20 (dry)
Sampling Date	7-Jun-17
Static Water Level (mbtoc)	1.750

Table 5.18A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 18A					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	8.31	6.09	8.4	8.8	6.75	8.5
Field EC	mS	-	1.614	1.80	15.82	1.64	1.92	1.52
Field Temperature	°C	-	7.6	6.79	6.4	6.6	8.3	8.7
Routine Water								
pH	-	6.5 - 8.5	8.52	8.58	8.61	8.39	8.44	8.5
Conductivity (EC)	µS/cm	-	1500	1,500	1500	1500	1500	1500
Calcium	mg/L	-	3.8	3.1	3	2.7	3.0	2.9
Magnesium	mg/L	-	0.39	0.36	<2.0	0.30	0.34	0.31
Sodium	mg/L	200	380	360	390	360	380	380
Potassium	mg/L	-	1.4	1.3	<3.0	1.3	1.5	1.4
Iron	mg/L	0.3	<0.060	<0.060	<0.60	<0.060	0.11	<0.060
Sulphate	mg/L	500	<1.0	2.0	2.4	1.4	6.9	2.1
Chloride	mg/L	250	6.7	6.2	7.3	7.2	7.4	7.3
Bicarbonate	mg/L	-	960	980	970	1000	950	1000
Carbonate	mg/L	-	26	30	38	8.9	9.5	17
Nitrate (N)	mg/L	10	<0.0030	<0.003	<0.010	<0.010	0.011	<0.044
TDS*	mg/L	500	900	890	920	880	870	910
Water Nutrients								
Ammonia-N	mg/L	-	0.64	0.62	0.62	0.64	0.66	0.72
TKN	mg/L	-	1	1.1	1.1	0.98	0.90	0.94
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	24	34	29	28	27	26
DOC	mg/L	-	7.2	6.5	5.2	6.9	6.9	7.2
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0046	0.029	0.0045
Antimony	mg/L	0.006	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.0010	0.00092	0.001
Barium	mg/L	1	0.095	0.098	<0.10	0.089	0.091	0.1
Boron	mg/L	5	n/a	n/a	n/a	0.78	0.81	0.83
Cadmium	mg/L	0.005	0.000024	<0.000025	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00056	0.00045	0.00067	0.00031	0.00031	<0.00030
Copper	mg/L	1	0.00059	0.00039	0.00057	0.00025	0.00023	0.00038
Lead	mg/L	0.01	<0.00020	<0.00020	0.00033	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.045	0.059	0.04
Mercury	mg/L	0.001	<0.002	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0046	0.0047	0.0048	0.0043	0.0043	0.0043
Nickel	mg/L	-	0.0043	0.0036	0.0044	0.0039	0.0035	0.0024
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	0.00026	0.00013	0.00026
Zinc	mg/L	5	0.0038	<0.0030	0.0033	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.704
Volume Purged (L)	39 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	1.925

Table 5.18B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 18B					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.06	6.04	7.6	8.0	6.00	7.4
Field EC	mS	-	3.10	4.92	2.92	3.80	4.24	3.16
Field Temperature	°C	-	7.2	11.6	8.9	5.9	8.3	8.0
Routine Water								
pH	-	6.5 - 8.5	7.92	8.11	8.27	7.79	7.96	8.05
Conductivity (EC)	µS/cm	-	6900	4200	2900	3600	3400	3000
Calcium	mg/L	-	540	230	120	190	180	180
Magnesium	mg/L	-	150	57	33	47	45	48
Sodium	mg/L	200	1300	690	510	670	570	530
Potassium	mg/L	-	8.4	4.9	3.7	4.6	4.5	4.4
Iron	mg/L	0.3	<0.060	<0.060	<0.060	<0.060	0.25	<0.060
Sulphate	mg/L	500	3700	2200	1400	1700	1500	1100
Chloride	mg/L	250	3.5	17	14	17	22	29
Bicarbonate	mg/L	-	980	400	350	410	390	760
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.016	0.2	0.2	0.13	0.089	0.36
TDS*	mg/L	500	6200	3400	2300	2800	2600	2200
Water Nutrients								
Ammonia-N	mg/L	-	0.48	0.23	0.09	0.14	0.10	0.17
TKN	mg/L	-	1.2	1.1	0.68	1.5	0.32	0.87
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	53	34	27	64	30	24
DOC	mg/L	-	8.9	9.3	7.3	9.2	8.2	11
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0034	0.11	0.0062
Antimony	mg/L	0.006	<0.0060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.0004	0.00041	0.00037
Barium	mg/L	1	0.012	0.011	0.017	0.012	0.014	0.016
Boron	mg/L	5	n/a	n/a	n/a	0.071	0.075	0.062
Cadmium	mg/L	0.005	0.000053	0.00004	<0.000025	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	0.0005	0.00039	0.00041	0.00031	0.00039
Copper	mg/L	1	<0.0020	0.0014	0.0012	0.0007	0.0013	0.00064
Lead	mg/L	0.01	<0.0020	<0.00020	<0.0002	<0.00020	0.00037	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.15	0.046	0.15
Mercury	mg/L	0.001	0.0000033	<0.0000050	<0.0000050	<0.0000050	0.0000068	<0.0000020
Molybdenum	mg/L	-	<0.0020	0.0009	0.0011	0.00074	0.00072	0.00066
Nickel	mg/L	-	0.0053	0.0039	0.0035	0.0039	0.0044	0.004
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0011	0.00091	0.0044
Zinc	mg/L	5	<0.030	0.005	<0.0030	<0.0030	0.0047	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	5.992
Volume Purged (L)	27 (Dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	1.240

Table 5.19A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 19A					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.47	5.23	8.2	7.7	7.97	7.6
Field EC	mS	-	3.67	7.94	6.35	7.87	8.51	6.00
Field Temperature	°C	-	7.5	8.2	8.7	6.3	n/a	7.7
Routine Water								
pH	-	6.5 - 8.5	8.11	8.45	8.09	7.99	8.25	8.31
Conductivity (EC)	µS/cm	-	8300	6200	7900	7500	6900	6900
Calcium	mg/L	-	85	32	90	62	55	57
Magnesium	mg/L	-	46	20	42	37	32	32
Sodium	mg/L	200	2300	1500	2200	1900	1500	1700
Potassium	mg/L	-	11	7.7	8.9	9.4	8.9	8.6
Iron	mg/L	0.3	<0.060	0.13	<0.60	<0.060	<0.060	<0.60
Sulphate	mg/L	500	3900	2600	3700	3400	3000	2800
Chloride	mg/L	250	10	3.1	8.8	8.9	6.7	7.4
Bicarbonate	mg/L	-	1200	1100	1200	1200	1100	1200
Carbonate	mg/L	-	<0.50	25	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.2	0.02	0.15	0.023	<0.050	0.16
TDS*	mg/L	500	6900	4700	6700	6000	5200	5200
Water Nutrients								
Ammonia-N	mg/L	-	0.69	0.82	0.98	0.43	0.49	0.76
TKN	mg/L	-	1.2	1	1.4	0.80	0.96	1.1
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	28	22	20	25	19	27
DOC	mg/L	-	7.3	6.8	6	7.5	7.1	7.1
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.030	0.0072	<0.0030
Antimony	mg/L	0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	<0.0020	0.00065	0.00054
Barium	mg/L	1	0.013	0.028	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	0.40	0.41	0.43
Cadmium	mg/L	0.005	0.000092	<0.000050	0.000055	<0.00020	0.000039	<0.000020
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	<0.0030	<0.0030	<0.0030	0.00042	0.00043
Copper	mg/L	1	0.0043	<0.0020	<0.0020	<0.0020	0.0014	0.00041
Lead	mg/L	0.01	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.39	0.36	0.4
Mercury	mg/L	0.001	<0.0020	0.0000082	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.0020	0.0037	0.0022	<0.0020	0.0016	0.0016
Nickel	mg/L	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0028	0.0017
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	0.005	0.006	0.006
Zinc	mg/L	5	<0.030	<0.030	<0.030	<0.030	0.0082	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.71
Volume Purged (L)	34 (Dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	0.805

Table 5.19B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW19B					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.75	5.32	7.5	8.4	8.09	8.2
Field EC	mS	-	2.81	7.51	8.08	6.26	7.17	6.43
Field Temperature	°C	-	7.9	8	8.3	6.5	n/a	7
Routine Water								
pH	-	6.5 - 8.5	8.4	8.27	8.33	8.26	8.43	8.5
Conductivity (EC)	µS/cm	-	6500	8200	6000	5900	5700	5800
Calcium	mg/L	-	61	77	29	32	31	29
Magnesium	mg/L	-	25	35	20	17	17	18
Sodium	mg/L	200	1800	2000	1500	1500	1300	1400
Potassium	mg/L	-	8.8	8.7	6.7	7.4	7.6	7.5
Iron	mg/L	0.3	0.26	<0.060	<0.60	0.36	0.21	<0.6
Sulphate	mg/L	500	2800	3700	2600	2400	2200	2000
Chloride	mg/L	250	4.2	9.8	2.6	3.1	3.1	2.7
Bicarbonate	mg/L	-	1100	1200	1100	1100	1000	1100
Carbonate	mg/L	-	19	<0.50	5	<0.50	13	22
Nitrate (N)	mg/L	10	0.015	0.21	<0.010	<0.010	0.015	<0.044
TDS*	mg/L	500	5200	6500	4700	4500	4100	4100
Water Nutrients								
Ammonia-N	mg/L	-	0.73	1	0.76	0.76	0.73	0.84
TKN	mg/L	-	1.1	1.6	1.1	1.1	1.1	1.0
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.0006	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	22	27	28	17	17	17
DOC	mg/L	-	5.9	8.2	5	5.7	6.0	6.3
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.030	<0.0030	0.0034
Antimony	mg/L	0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.0021	0.0025	0.0017
Barium	mg/L	1	0.019	0.02	<0.10	0.027	0.029	<0.10
Boron	mg/L	5	n/a	n/a	n/a	0.47	0.48	0.52
Cadmium	mg/L	0.005	<0.050	0.00011	<0.000050	<0.00020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.010	0.0010	<0.001
Cobalt	mg/L	-	<0.0030	<0.0030	<0.0030	<0.0030	0.0003	<0.00030
Copper	mg/L	1	<0.0020	<0.0020	<0.0020	<0.0020	0.00023	<0.00020
Lead	mg/L	0.01	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.21	0.21	0.19
Mercury	mg/L	0.001	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.0020	0.0021	0.0029	<0.0020	0.0020	0.0016
Nickel	mg/L	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0025	<0.00050
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	<0.0010	0.00021	0.00024
Zinc	mg/L	5	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Pipe is bent and was unable to measure water elevation (bent)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	5.335
Volume Purged (L)	27.0
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	0.887

Table 5.20A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 20A					
			May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.63	n/a	8.0	8.2	8.6	7.8
Field EC	mS	-	1.999	3.98	3.5	3.31	3.57	3.00
Field Temperature	°C	-	8.7	8.4	7.8	7.9	8.1	6.9
Routine Water								
pH	-	6.5 - 8.5	8.37	8.4	8.05	8.03	8.15	8.34
Conductivity (EC)	µS/cm	-	3400	3400	3300	3100	3300	3200
Calcium	mg/L	-	22	19	19	18	19	18
Magnesium	mg/L	-	2.9	2.6	2.7	2.4	2.5	2.4
Sodium	mg/L	200	930	800	800	750	830	780
Potassium	mg/L	-	3.8	3.3	3.3	3.5	3.3	2.9
Iron	mg/L	0.3	<0.060	<0.060	0.44	<0.060	<0.060	<0.060
Sulphate	mg/L	500	830	800	800	680	740	660
Chloride	mg/L	250	6.9	6.7	6.9	8.3	7.0	7.9
Bicarbonate	mg/L	-	1200	1200	1300	1200	1300	1200
Carbonate	mg/L	-	15	18	<0.50	<0.50	<0.50	5.5
Nitrate (N)	mg/L	10	1.8	3.4	1.8	6.6	3.1	21
TDS*	mg/L	500	2400	2300	2300	2100	2200	2100
Water Nutrients								
Ammonia-N	mg/L	-	0.49	0.55	0.33	0.23	0.53	0.3
TKN	mg/L	-	1	1.3	1	0.93	1.2	1.0
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	45	75	66	28	19	35
DOC	mg/L	-	5.9	5.2	4.4	5.7	4.3	6.4
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0052	0.0040	0.0078
Antimony	mg/L	0.006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.00037	0.00051	0.0004
Barium	mg/L	1	0.022	0.021	0.025	0.015	0.018	0.027
Boron	mg/L	5	n/a	n/a	n/a	0.80	0.92	0.79
Cadmium	mg/L	0.005	0.000066	0.000031	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0050	<0.0010	0.0019	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0015	<0.00030	0.00057	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	0.0025	0.0016	0.0036	0.00075	0.00038	0.00031
Lead	mg/L	0.01	<0.0010	<0.00020	0.0003	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.026	0.026	0.031
Mercury	mg/L	0.001	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0018	0.0018	0.0016	0.0016	0.0014	0.0015
Nickel	mg/L	-	<0.0025	0.0016	0.0031	0.0015	0.0011	0.0014
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.00020	0.0014	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0015	0.0016	0.0015
Zinc	mg/L	5	0.017	0.0084	0.0036	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.62
Volume Purged (L)	31 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	3.718

Table 5.20B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 20B					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.41	5.32	7.9	7.9	7.64	7.6
Field EC	mS	-	1.97	5.35	5.32	5.03	4.97	5.18
Field Temperature	°C	-	6.9	7.1	7.9	5.5	7.3	6.2
Routine Water								
pH	-	6.5 - 8.5	8.14	8.19	8.02	8.04	8.04	8.17
Conductivity (EC)	µS/cm	-	4600	4600	4900	4700	4700	5000
Calcium	mg/L	-	110	110	130	120	110	140
Magnesium	mg/L	-	34	39	47	39	37	50
Sodium	mg/L	200	1100	960	1000	1000	1000	1100
Potassium	mg/L	-	9.2	8.7	9.4	9.0	9.0	9.8
Iron	mg/L	0.3	<0.060	<0.060	0.24	<0.060	<0.60	<0.60
Sulphate	mg/L	500	1800	1900	2200	1900	1800	1900
Chloride	mg/L	250	1.6	1.6	1.3	1.5	1.4	1.1
Bicarbonate	mg/L	-	1000	960	950	990	1100	960
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.052	0.28	0.27	0.17	0.14	0.86
TDS*	mg/L	500	3600	3500	3800	3600	3500	3700
Water Nutrients								
Ammonia-N	mg/L	-	0.13	<0.05	0.058	<0.050	<0.050	0.035
TKN	mg/L	-	1.3	2.9	3	3.7	0.29	0.74
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	91	63	96	120	15	81
DOC	mg/L	-	5.9	5.6	7.2	6.4	4.3	6
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0035	<0.0030	0.0041
Antimony	mg/L	0.006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.00032	0.00030	0.00032
Barium	mg/L	1	0.015	0.017	0.022	0.014	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	0.33	0.38	0.35
Cadmium	mg/L	0.005	0.000051	0.00018	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0050	0.0033	0.0036	0.0029	0.0035	0.0011
Cobalt	mg/L	-	<0.0015	<0.00030	<0.0003	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	0.0025	0.0012	0.002	0.0013	0.00053	0.00059
Lead	mg/L	0.01	<0.0010	<0.00020	0.00036	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	<0.0040	<0.040	<0.040
Mercury	mg/L	0.001	0.0000032	<0.0000050	<0.0000050	<0.0000050	0.0000026	<0.0000020
Molybdenum	mg/L	-	<0.0010	0.00096	0.00094	0.00083	0.00076	0.00078
Nickel	mg/L	-	<0.0025	0.0013	0.0023	0.0011	0.0016	0.00067
Selenium	mg/L	0.05	n/a	n/a	n/a	0.0031	<0.00020	0.013
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0033	0.0013	0.005
Zinc	mg/L	5	<0.015	0.0037	0.0045	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	5.103
Volume Purged (L)	3.4
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	3.375

Table 5.21A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 21A					
			May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	8.2	7.79	9.9	8.3	7.88	7.9
Field EC	mS	-	1.5	2.38	2.12	2.11	2.14	2.03
Field Temperature	°C	-	8.9	10.2	8.3	8.4	7.9	7.5
Routine Water								
pH	-	6.5 - 8.5	8.59	8.33	8.18	8.19	8.29	8.41
Conductivity (EC)	µS/cm	-	2100	2000	2000	2000	2000	2000
Calcium	mg/L	-	4.1	4.8	4.4	4.4	4.7	4.3
Magnesium	mg/L	-	0.47	0.53	0.47	0.44	0.45	0.4
Sodium	mg/L	200	540	460	470	490	490	480
Potassium	mg/L	-	2	1.6	1.8	1.9	1.7	1.5
Iron	mg/L	0.3	<0.060	<0.060	0.22	<0.060	<0.060	<0.060
Sulphate	mg/L	500	91	82	90	72	71	65
Chloride	mg/L	250	8.9	8.4	9.3	9.4	8.7	11
Bicarbonate	mg/L	-	1200	1300	1300	1300	1300	1300
Carbonate	mg/L	-	38	8.5	<0.50	<0.50	<0.50	11
Nitrate (N)	mg/L	10	1.8	1.8	2.3	1.2	1.3	4.1
TDS*	mg/L	500	1300	1200	1200	1200	1200	1200
Water Nutrients								
Ammonia-N	mg/L	-	0.065	0.24	0.068	0.12	0.12	0.071
TKN	mg/L	-	0.95	2.2	1.4	1.7	0.81	0.96
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	0.00074	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	41	110	96	74	28	43
DOC	mg/L	-	9.8	10	7	8.4	7.1	9.2
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0058	0.0047	0.0043
Antimony	mg/L	0.006	<0.00060	0.0011	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.00093	0.0010	0.0011
Barium	mg/L	1	0.085	0.084	0.073	0.062	0.073	0.096
Boron	mg/L	5	n/a	n/a	n/a	0.83	0.93	0.82
Cadmium	mg/L	0.005	0.000062	0.0001	0.000034	0.000067	0.000079	0.000099
Chromium	mg/L	0.05	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	0.0009	0.003	0.0015	0.0012	0.0025	0.0016
Lead	mg/L	0.01	<0.00020	<0.00020	0.00024	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	<0.0040	<0.0040	0.0047
Mercury	mg/L	0.001	<0.0020	<0.000010	0.0000058	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0071	0.0069	0.0065	0.0058	0.0062	0.0058
Nickel	mg/L	-	0.0025	0.0027	0.0027	0.0029	0.0031	0.0028
Selenium	mg/L	0.05	n/a	n/a	n/a	0.00022	<0.00020	0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0034	0.0033	0.0036
Zinc	mg/L	5	<0.0030	0.005	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.675
Volume Purged (L)	18 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	4.979

Table 5.21B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 21B					
			May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.68	5.6	8.0	8.3	7.89	7.8
Field EC	mS	-	1.18	2.99	2.87	2.82	2.84	2.78
Field Temperature	°C	-	6.9	n/a	6.6	6.9	6.5	6.5
Routine Water								
pH	-	6.5 - 8.5	8.33	8.43	8.21	8.16	8.25	8.39
Conductivity (EC)	µS/cm	-	2700	2700	2700	2700	2600	2600
Calcium	mg/L	-	17	16	17	16	16	17
Magnesium	mg/L	-	5.6	5.4	5.6	4.9	5.0	5.3
Sodium	mg/L	200	700	620	610	630	630	640
Potassium	mg/L	-	4.3	3.9	4	4.2	3.9	4.1
Iron	mg/L	0.3	<0.060	<0.060	0.071	<0.060	<0.060	<0.060
Sulphate	mg/L	500	590	590	650	570	530	570
Chloride	mg/L	250	1.1	1.7	1.5	1.6	1.1	1.1
Bicarbonate	mg/L	-	1000	1000	1000	1000	1000	1000
Carbonate	mg/L	-	8.3	19	<0.50	<0.50	<0.50	9.2
Nitrate (N)	mg/L	10	0.022	0.045	<0.010	0.11	0.11	0.19
TDS*	mg/L	500	1800	1800	1800	1800	1700	1800
Water Nutrients								
Ammonia-N	mg/L	-	<0.050	<0.05	<0.050	<0.050	<0.050	0.016
TKN	mg/L	-	0.4	0.36	0.34	0.28	<0.05	0.31
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	34	23	31	20	20	20
DOC	mg/L	-	5.5	4.7	3.8	4.2	4.4	6.1
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0042	<0.0030	0.0035
Antimony	mg/L	0.006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.00053	0.00064	0.00064
Barium	mg/L	1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Boron	mg/L	5	n/a	n/a	n/a	0.22	0.25	0.23
Cadmium	mg/L	0.005	0.000057	0.000038	0.000042	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0050	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0015	<0.00030	<0.0003	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	0.0011	0.0014	0.0014	0.0008	0.00066	0.00033
Lead	mg/L	0.01	<0.0010	<0.00020	<0.0002	<0.00020	<0.00020	0.00034
Manganese	mg/L	0.05	n/a	n/a	n/a	<0.004	<0.0040	0.0041
Mercury	mg/L	0.001	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0011	0.002	0.0063	0.0051	0.0027	0.0018
Nickel	mg/L	-	<0.0025	0.001	0.0015	0.0013	0.0013	0.00086
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0016	0.0017	0.0017
Zinc	mg/L	5	0.016	0.0051	0.003	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	6.096
Volume Purged (L)	18 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.990

Table 5.22A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 22A					
			May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.9	7.45	9.9	n/a	7.76	7.6
Field EC	mS	-	1.34	4.78	5.64	n/a	5.60	5.29
Field Temperature	°C	-	9.6	10.9	7.4	n/a	10.0	9
Routine Water								
pH	-	6.5 - 8.5	8.33	8.18	7.83	8.08	8.09	8.33
Conductivity (EC)	µS/cm	-	5500	5300	5300	5300	5300	5200
Calcium	mg/L	-	35	36	36	36	35	36
Magnesium	mg/L	-	3.8	3.6	3.7	3.6	3.4	3.6
Sodium	mg/L	200	1300	1300	1300	1200	1200	1300
Potassium	mg/L	-	4.9	3.9	4.1	4.7	4.1	4.6
Iron	mg/L	0.3	0.083	<0.060	0.065	<0.060	<0.60	<0.60
Sulphate	mg/L	500	2500	2200	2200	2000	2000	1900
Chloride	mg/L	250	11	11	11	12	11	13
Bicarbonate	mg/L	-	940	950	940	960	960	950
Carbonate	mg/L	-	4.8	<0.50	<0.50	<0.50	<0.50	2.4
Nitrate (N)	mg/L	10	16	15	16	16	17	70
TDS*	mg/L	500	4400	4100	4100	3800	3800	3800
Water Nutrients								
Ammonia-N	mg/L	-	0.34	0.18	<0.050	0.11	<0.050	0.15
TKN	mg/L	-	0.74	0.83	1.2	0.99	0.070	1
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.75	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	56	49	92	49	21	36
DOC	mg/L	-	6.2	7.4	5.1	7.0	5.4	6.7
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.030	0.0047	0.0058
Antimony	mg/L	0.006	<0.0060	0.00091	<0.00060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	<0.0020	0.00033	0.0003
Barium	mg/L	1	0.011	0.01	0.014	<0.010	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	0.82	0.85	0.9
Cadmium	mg/L	0.005	0.00022	0.00012	0.000059	<0.00020	0.000026	0.000058
Chromium	mg/L	0.05	<0.010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	<0.00030	<0.00030	<0.0030	<0.00030	<0.00030
Copper	mg/L	1	<0.0020	0.0024	0.00084	<0.0020	0.0024	0.002
Lead	mg/L	0.01	<0.0020	<0.00020	<0.00020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.018	<0.040	<0.040
Mercury	mg/L	0.001	<0.0020	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.006	0.0062	0.0054	0.0056	0.0057	0.006
Nickel	mg/L	-	<0.0050	0.0028	0.0024	<0.0050	0.0051	0.0023
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	0.004	0.0042	0.0041
Zinc	mg/L	5	<0.030	0.0052	<0.0030	<0.030	0.0033	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.635
Volume Purged (L)	17 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	5.033

Table 5.22B: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	MW 22B					
				May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements									
Field pH	-	6.5-8.5	-	7.35	5.5	7.7	7.8	7.57	7.5
Field EC	mS		-	3.5	8.25	8.56	8.25	8.78	7.87
Field Temperature	°C		-	6.8	10.3	6.4	8.4	9.7	7.8
Routine Water									
pH	-	6.5-8.5	6.5 - 8.5	8.18	8.24	8.07	7.86	7.97	8.23
Conductivity (EC)	µS/cm	1000	-	8100	8200	8100	8200	8200	8000
Calcium	mg/L		-	120	100	110	120	110	110
Magnesium	mg/L		-	52	49	51	55	55	54
Sodium	mg/L	200	200	2100	2000	2100	1900	2000	2000
Potassium	mg/L		-	9.8	9	8.5	10	10	9.8
Iron	mg/L	0.3	0.3	<0.060	<0.060	0.075	<0.60	<0.60	<0.60
Sulphate	mg/L	128|218|309|429	500	3800	3800	3900	3900	3900	3300
Chloride	mg/L	100	250	1.5	1.8	1.3	1.8	1.4	1.9
Bicarbonate	mg/L		-	1200	1200	1200	1200	1300	1200
Carbonate	mg/L		-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	3	10	0.18	0.11	0.11	0.16	<0.010	0.38
TDS*	mg/L	500	500	6700	6600	6800	6600	6600	6000
Water Nutrients									
Ammonia-N	mg/L		-	<0.050	<0.05	<0.050	<0.050	<0.050	0.04
TKN	mg/L		-	0.36	0.46	0.36	0.52	0.27	0.32
Hydrocarbons									
Benzene	mg/L	0.005	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L		0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L		-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics									
COD	mg/L		-	19	37	15	51	18	20
DOC	mg/L		-	5.9	6	5.3	5.7	4.7	6.6
Metals									
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	<0.030	<0.0030	0.0037
Antimony	mg/L	0.006	0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	<0.0020	0.00035	0.00027
Barium	mg/L	1	1	<0.010	<0.010	<0.010	<0.10	<0.10	<0.10
Boron	mg/L	1	5	n/a	n/a	n/a	0.25	0.25	0.25
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	0.000096	0.000082	0.00018	<0.00020	<0.000020	<0.000020
Chromium	mg/L		0.05	<0.010	<0.010	<0.010	<0.010	0.0015	<0.0010
Cobalt	mg/L		-	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	<0.00030
Copper	mg/L	0.007	1	0.0046	<0.0020	<0.0020	<0.0020	0.0012	0.00037
Lead	mg/L	38|0.004|0.0042|0.0	0.01	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	<0.040	<0.040	<0.040
Mercury	mg/L	0.00005	0.001	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L		-	<0.0020	<0.0020	<0.0020	<0.0020	0.00081	0.00082
Nickel	mg/L	054|0.057|0.059|0.0	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0020	0.0013
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	<0.0020	0.00036	0.00028
Vanadium	mg/L		-	n/a	n/a	n/a	<0.010	<0.0010	<0.0010
Zinc	mg/L	0.03	5	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	6.098
Volume Purged (L)	16 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	3.230

Table 5.23A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 23A					
			May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.85	6.08	8.5	8.8	8.65	8.8
Field EC	mS	-	3.5	2.81	2.25	2.24	2.24	2.13
Field Temperature	°C	-	12	9.1	7.9	8.9	8.6	8.5
Routine Water								
pH	-	6.5 - 8.5	8.57	8.63	8.48	8.44	8.53	8.75
Conductivity (EC)	µS/cm	-	2300	2200	2200	2100	2100	2100
Calcium	mg/L	-	4.7	4.8	5.4	4.1	4.1	4.4
Magnesium	mg/L	-	0.62	0.6	0.63	0.48	0.49	0.47
Sodium	mg/L	200	580	550	570	500	560	570
Potassium	mg/L	-	2.2	1.9	1.8	2.2	2.0	2
Iron	mg/L	0.3	<0.060	<0.060	0.38	<0.060	<0.060	<0.060
Sulphate	mg/L	500	190	160	110	90	85	77
Chloride	mg/L	250	19	19	17	20	18	21
Bicarbonate	mg/L	-	1300	1200	1300	1300	1300	1300
Carbonate	mg/L	-	35	55	28	17	26	54
Nitrate (N)	mg/L	10	0.005	<0.003	<0.010	<0.010	<0.010	<0.044
TDS*	mg/L	500	1500	1400	1400	1300	1300	1300
Water Nutrients								
Ammonia-N	mg/L	-	0.86	0.79	0.6	0.76	0.76	0.93
TKN	mg/L	-	1.7	2	1.5	1.4	1.5	1.6
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	0.12	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	78	78	81	55	55	57
DOC	mg/L	-	19	18	16	16	16	21
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0043	0.0049	0.01
Antimony	mg/L	0.006	<0.00060	0.0012	0.00082	<0.00060	<0.00060	0.0013
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.0065	0.0058	0.009
Barium	mg/L	1	0.037	0.043	0.040	0.038	0.050	0.063
Boron	mg/L	5	n/a	n/a	n/a	0.77	0.88	0.85
Cadmium	mg/L	0.005	0.00011	0.000066	0.000075	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00036	0.0003	0.0007	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	0.00059	0.00026	0.0028	0.00042	0.00049	<0.00020
Lead	mg/L	0.01	<0.00020	<0.00020	0.00088	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.0071	0.0079	0.0064
Mercury	mg/L	0.001	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0058	0.0055	0.0050	0.0042	0.0046	0.0045
Nickel	mg/L	-	0.0069	0.0069	0.0097	0.0032	0.0031	0.0095
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0032	0.0027	0.0049
Zinc	mg/L	5	0.0071	<0.0030	0.0031	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.663
Volume Purged (L)	26 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	0.982

Table 5.23B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 23B					
			May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.17	5.77	7.5	7.8	7.45	7.3
Field EC	mS	-	4.38	10.67	9.8	9.75	10.17	9.70
Field Temperature	°C	-	8.8	9.5	9.9	9.8	10.3	9.3
Routine Water								
pH	-	6.5 - 8.5	8.07	8.24	8.06	7.76	7.89	8.05
Conductivity (EC)	µS/cm	-	9400	9700	9600	9700	9900	10000
Calcium	mg/L	-	160	150	170	170	170	170
Magnesium	mg/L	-	56	55	64	62	63	66
Sodium	mg/L	200	2500	2300	2400	2300	2400	2400
Potassium	mg/L	-	11	11	11	13	12	12
Iron	mg/L	0.3	0.07	<0.060	<0.60	<0.60	<0.60	<0.60
Sulphate	mg/L	500	4900	5400	5200	4900	4900	4700
Chloride	mg/L	250	2.2	2.6	2.2	2.6	1.9	3.7
Bicarbonate	mg/L	-	1000	1100	1100	1000	1100	1100
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.073	0.26	0.36	0.072	0.32	0.85
TDS*	mg/L	500	8200	8500	8400	7900	8000	7900
Water Nutrients								
Ammonia-N	mg/L	-	0.3	0.39	0.18	0.42	<0.050	0.39
TKN	mg/L	-	0.76	1.1	0.56	0.76	0.46	0.67
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	0.23	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	30	45	47	23	22	22
DOC	mg/L	-	6.5	7.1	5.8	7.4	5.5	9.5
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.030	0.0081	<0.0030
Antimony	mg/L	0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	<0.0020	0.00024	0.0003
Barium	mg/L	1	<0.010	<0.010	<0.10	<0.10	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	0.35	0.40	0.36
Cadmium	mg/L	0.005	0.000083	0.00062	0.00005	<0.00020	0.00028	0.000047
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	0.00033
Copper	mg/L	1	<0.0020	<0.0020	<0.0020	<0.0020	0.0013	<0.00020
Lead	mg/L	0.01	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.14	0.065	0.12
Mercury	mg/L	0.001	0.0000025	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.0020	<0.0020	<0.0020	<0.0020	0.0005	0.00025
Nickel	mg/L	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0028	0.0012
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0023	0.0020	0.0035
Zinc	mg/L	5	<0.030	<0.030	<0.030	<0.030	0.0039	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	4.463
Volume Purged (L)	16.0
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	4.463

Table 5.24A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 24A					
			May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.69	6.74	7.9	8.1	7.85	7.7
Field EC	mS	-	2.66	7.17	6.24	6.57	6.91	12.15
Field Temperature	°C	-	8.7	10.1	9.9	8.0	8.5	7.6
Routine Water								
pH	-	6.5 - 8.5	8.21	8.24	8.28	7.98	8.08	7.96
Conductivity (EC)	µS/cm	-	6200	6300	6200	6200	6100	12000
Calcium	mg/L	-	73	64	80	67	69	260
Magnesium	mg/L	-	8.1	7.3	9.7	7.5	7.9	180
Sodium	mg/L	200	1600	1400	1500	1500	1400	3100
Potassium	mg/L	-	5.8	5.3	5.2	5.6	5.6	11
Iron	mg/L	0.3	<0.060	<0.060	1.1	<0.060	<0.60	<0.60
Sulphate	mg/L	500	2900	3000	3100	2900	2800	6400
Chloride	mg/L	250	4	3.9	4.3	5.0	4.0	16
Bicarbonate	mg/L	-	700	720	720	710	710	970
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.91	1.5	1.1	1.2	1.2	9.2
TDS*	mg/L	500	5000	4900	5100	4800	4700	10000
Water Nutrients								
Ammonia-N	mg/L	-	1.5	1.2	0.84	1.1	0.061	1.3
TKN	mg/L	-	1.9	1.8	1.4	1.5	0.45	2.7
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	41	23	27	37	16	84
DOC	mg/L	-	5	5.2	4.5	5.3	4.3	38
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.030	0.0049	0.0034
Antimony	mg/L	0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	<0.0020	0.00045	0.0014
Barium	mg/L	1	0.021	0.02	<0.10	0.018	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	0.79	0.84	0.62
Cadmium	mg/L	0.005	<0.050	0.000076	<0.000050	<0.00020	<0.000020	0.00009
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	0.00084
Copper	mg/L	1	<0.0020	<0.0020	<0.0020	<0.0020	0.00069	0.004
Lead	mg/L	0.01	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.055	0.065	0.38
Mercury	mg/L	0.001	0.0000022	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0028	0.0027	<0.0020	0.0021	0.0025	0.0057
Nickel	mg/L	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0019	0.016
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0020	<0.00020	0.0027
Uranium	mg/L	0.02	n/a	n/a	n/a	<0.0010	0.00090	0.25
Zinc	mg/L	5	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.464
Volume Purged (L)	44 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	3.205

Table 5.24B: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	MW 24B					
				May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements									
Field pH	-	6.5-8.5	-	7.33	6.22	7.8	7.5	6.15	7.3
Field EC	mS		-	3.89	9.92	10.01	9.48	11.85	9.59
Field Temperature	°C		-	8.2	10.1	4.9	7.8	n/a	7.3
Routine Water									
pH	-	6.5-8.5	6.5 - 8.5	8.07	8.1	8.15	7.74	7.96	7.86
Conductivity (EC)	µS/cm	1000	-	9200	9000	9100	9000	9100	9200
Calcium	mg/L		-	240	240	270	280	320	360
Magnesium	mg/L		-	130	130	160	140	170	200
Sodium	mg/L	200	200	2300	1900	2000	2000	1900	1900
Potassium	mg/L		-	10	9.4	9.1	10	12	10
Iron	mg/L	0.3	0.3	<0.060	<0.060	<0.60	<0.060	<0.060	<0.60
Sulphate	mg/L	128|218|309|429	500	4700	4700	5100	4700	4400	4600
Chloride	mg/L	100	250	100	93	82	81	72	54
Bicarbonate	mg/L		-	1200	1200	1100	1100	1000	970
Carbonate	mg/L		-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hydroxide	mg/L		-	n/a	n/a	n/a	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	3	10	0.0055	0.022	0.013	0.014	<0.010	<0.22
TDS*	mg/L	500	500	8000	7600	8100	7700	7300	7600
Water Nutrients									
Ammonia-N	mg/L		-	<0.050	<0.05	0.064	0.094	0.11	0.035
TKN	mg/L		-	1.3	1.3	1.2	1.1	0.75	0.85
Hydrocarbons									
Benzene	mg/L	0.005	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L		0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L		-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics									
COD	mg/L		-	73	68	58	62	47	44
DOC	mg/L		-	22	24	19	19	19	16
Metals									
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	<0.030	<0.0030	0.0039
Antimony	mg/L	0.006	0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	<0.0020	0.00085	0.00071
Barium	mg/L	1	1	0.011	0.012	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	1	5	n/a	n/a	n/a	0.24	0.26	0.24
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	<0.050	0.000066	0.000064	<0.00020	0.000047	0.000029
Chromium	mg/L		0.05	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L		-	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	<0.00030
Copper	mg/L	0.007	1	0.0044	0.0036	0.0042	0.0036	0.0041	0.0022
Lead	mg/L	38|0.004|0.0042|0.0	0.01	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	0.0041	<0.0040	<0.040
Mercury	mg/L	0.00005	0.001	0.0000024	<0.0000050	<0.0000050	<0.0000050	0.0000029	<0.0000020
Molybdenum	mg/L		-	<0.0020	<0.0020	<0.0020	<0.0020	0.0023	0.0012
Nickel	mg/L	054|0.057|0.059|0.0	-	0.049	0.055	0.06	0.06	0.071	0.068
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	<0.0020	0.00035	0.00028
Uranium	mg/L	0.01	0.02	n/a	n/a	n/a	0.18	0.20	0.17
Zinc	mg/L	0.03	5	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Insufficient amount of water available during time of sampling (n/a[1])

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	6.08
Volume Purged (L)	22 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	2.490

Table 5.25A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 25A					
			May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	8.42	8.02	10	8.6	8.39	8.4
Field EC	mS	-	0.93	2.29	2.22	2.19	2.13	2.05
Field Temperature	°C	-	8.6	10.1	7.1	8.3	9.4	8.2
Routine Water								
pH	-	6.5 - 8.5	8.67	8.53	8.28	8.39	8.45	8.55
Conductivity (EC)	µS/cm	-	2200	2100	2000	2100	2100	2000
Calcium	mg/L	-	5.4	4.7	4.7	4.6	5.1	4.5
Magnesium	mg/L	-	0.59	0.5	0.49	0.44	0.47	0.42
Sodium	mg/L	200	490	570	480	490	540	490
Potassium	mg/L	-	2	1.9	1.9	2.3	1.8	1.7
Iron	mg/L	0.3	<0.060	<0.060	<0.060	<0.060	<0.060	<0.06
Sulphate	mg/L	500	3.2	7.1	14	13	4.3	3.1
Chloride	mg/L	250	8.3	8.5	8	9.2	8.4	8.9
Bicarbonate	mg/L	-	1300	1400	1400	1400	1400	1400
Carbonate	mg/L	-	62	39	<0.50	11	19	28
Nitrate (N)	mg/L	10	0.031	0.32	0.97	0.85	0.18	2
TDS*	mg/L	500	1200	1300	1200	1200	1300	1200
Water Nutrients								
Ammonia-N	mg/L	-	1.2	0.59	0.42	0.41	0.62	0.55
TKN	mg/L	-	3.9	1.2	1.1	1.1	1.2	1.2
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	190	29	32	35	29	25
DOC	mg/L	-	9.8	9.3	7.9	8.1	7.9	9.6
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0051	0.0046	0.0043
Antimony	mg/L	0.006	0.0033	0.0012	0.00078	0.0011	<0.00060	0.00064
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.0021	0.0019	0.0023
Barium	mg/L	1	0.11	0.085	0.081	0.081	0.088	0.10
Boron	mg/L	5	n/a	n/a	n/a	0.81	0.94	0.83
Cadmium	mg/L	0.005	0.000041	0.000033	<0.000025	0.000022	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00068	0.00037	0.00046	<0.00030	0.00034	0.00032
Copper	mg/L	1	0.0014	0.0022	0.0009	0.0009	0.00045	<0.00020
Lead	mg/L	0.01	0.00029	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.051	0.10	0.07
Mercury	mg/L	0.001	0.0000059	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.013	0.0044	0.0039	0.0051	0.0064	0.006
Nickel	mg/L	-	0.0054	0.0025	0.0025	0.0032	0.0023	0.0022
Selenium	mg/L	0.05	n/a	n/a	n/a	0.00041	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0015	0.00074	0.0012
Zinc	mg/L	5	0.005	0.0033	<0.0030	<0.0030	<0.0030	<0.0030
Polycyclic Aromatic Hydrocarbons (PAHs)								
Benzo[a]pyrene equivalency	mg/L	-	n/a	n/a	n/a	n/a	<0.000010	<0.000010
2-methylnaphthalene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthylene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acridine	mg/L	-	n/a	n/a	n/a	n/a	<0.00020	<0.00020
Anthracene	mg/L	-	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	0.00001	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(e)pyrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Chrysene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Fluorene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Naphthalene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Perylene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Pyrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000020	<0.000020
Quinoline	mg/L	-	n/a	n/a	n/a	n/a	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.688
Volume Purged (L)	22 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	1.250

Table 5.25B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 25B					
			May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.3	5.91	7.4	7.8	7.56	7.4
Field EC	mS	-	3.98	10.59	9.91	10.02	9.51	9.72
Field Temperature	°C	-	8.3	10.1	7.2	8.2	8.6	7.5
Routine Water								
pH	-	6.5 - 8.5	7.84	8.19	8.12	7.85	8.09	8.14
Conductivity (EC)	µS/cm	-	9200	9400	9400	9500	9500	9500
Calcium	mg/L	-	190	170	190	190	190	190
Magnesium	mg/L	-	50	47	54	53	51	54
Sodium	mg/L	200	2500	2200	2300	2200	2100	2300
Potassium	mg/L	-	12	11	11	12	12	12
Iron	mg/L	0.3	<0.060	<0.060	<0.60	<0.60	<0.060	<0.6
Sulphate	mg/L	500	4700	5100	5200	4600	4500	4100
Chloride	mg/L	250	1.4	2	1.9	2.2	2.5	2.3
Bicarbonate	mg/L	-	1000	1000	1100	1000	970	1000
Carbonate	mg/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	0.09	0.5	0.42	0.77	0.62	2.5
TDS*	mg/L	500	8000	8000	8300	7600	7300	7100
Water Nutrients								
Ammonia-N	mg/L	-	0.82	0.56	0.59	0.29	0.58	0.44
TKN	mg/L	-	1.2	0.53	0.84	0.86	1.2	0.87
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.0008
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Organics								
COD	mg/L	-	36	42	35	29	30	27
DOC	mg/L	-	9.2	8.4	9	9.9	10	12
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.030	0.0084	0.0053
Antimony	mg/L	0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.01	n/a	n/a	n/a	<0.0020	0.00055	0.00047
Barium	mg/L	1	0.012	0.015	<0.10	<0.10	0.011	<0.1
Boron	mg/L	5	n/a	n/a	n/a	0.46	0.46	0.47
Cadmium	mg/L	0.005	<0.050	0.000069	0.00021	<0.00020	<0.000020	<0.00002
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.010	0.0016	<0.001
Cobalt	mg/L	-	<0.0030	<0.0030	<0.0030	<0.0030	0.00075	0.00065
Copper	mg/L	1	0.0036	<0.0020	<0.0020	<0.0020	0.00081	0.00041
Lead	mg/L	0.01	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.0002
Manganese	mg/L	0.05	n/a	n/a	n/a	0.17	0.18	0.21
Mercury	mg/L	0.001	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	<0.0020	<0.0020	<0.0020	<0.0020	0.00072	0.00067
Nickel	mg/L	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0031	0.0028
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0020	<0.00020	<0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	<0.0010	0.00033	0.00028
Zinc	mg/L	5	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.003
Polycyclic Aromatic Hydrocarbons (PAHs)								
Benzo[a]pyrene equivalency	mg/L	-	n/a	n/a	n/a	n/a	<0.000010	<0.000010
2-methylnaphthalene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthylene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acridine	mg/L	-	n/a	n/a	n/a	n/a	<0.00020	<0.00020
Anthracene	mg/L	-	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	0.00001	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(e)pyrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Chrysene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Fluorene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Naphthalene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Perylene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Pyrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000020	<0.000020
Quinoline	mg/L	-	n/a	n/a	n/a	n/a	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	6.125
Volume Purged (L)	14 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	1.685

Table 5.26A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 26A					
			May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	8.1	8.31	9.9	n/a	n/a	-
Field EC	mS	-	2.15	2.97	2.91	n/a	n/a	-
Field Temperature	°C	-	8.6	9.4	6.7	n/a	n/a	-
Routine Water								
pH	-	6.5 - 8.5	8.68	8.58	8.45	8.38	8.53	8.56
Conductivity (EC)	µS/cm	-	2800	2,700	2700	2700	2600	2600
Calcium	mg/L	-	7.5	9.5	9.5	9.1	8.7	8.5 *
Magnesium	mg/L	-	1.1	1.4	1.4	1.2	1.1	1.2 *
Sodium	mg/L	200	680	690	680	650	640	670 *
Potassium	mg/L	-	2.3	2.3	2.4	2.7	2.5	2.4 *
Iron	mg/L	0.3	<0.060	<0.060	0.15	<0.060	0.084	<0.060 *
Sulphate	mg/L	500	730	610	610	520	490	510
Chloride	mg/L	250	5.4	5.8	5.9	5.3	5.0	5.4
Bicarbonate	mg/L	-	970	1,000	1000	1100	1100	1100
Carbonate	mg/L	-	41	34	15	8.6	23	23
Nitrate (N)	mg/L	10	1.5	1.8	1.6	0.94	1.0	5.7
TDS	mg/L	500	2000	1,900	1800	1700	1700	1700
Water Nutrients								
Ammonia-N	mg/L	-	<0.050	<0.05	<0.050	<0.050	<0.050	<0.015
TKN	mg/L	-	0.89	1.2	0.78	1.7	1.2	0.77
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.21	<0.10	<0.26	<0.10	<0.10
Organics								
COD	mg/L	-	50	77	29	n/a	51	26
DOC	mg/L	-	9.8	9.8	7.8	9.3	10	-
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0049	0.15	0.0099 *
Antimony	mg/L	0.006	<0.00060	0.00061	<0.00060	<0.00060	<0.00060	<0.00060 *
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.0021	0.0024	0.0023 *
Barium	mg/L	1	0.039	0.041	0.045	0.033	0.047	0.054 *
Boron	mg/L	5	n/a	n/a	n/a	0.74	0.85	0.81 *
Cadmium	mg/L	0.005	<0.050	0.00021	0.000034	<0.000020	<0.000020	<0.000020 *
Chromium	mg/L	0.05	<0.0010	0.0015	0.0012	<0.0010	<0.0010	<0.0010 *
Cobalt	mg/L	-	<0.00030	0.00032	0.00034	<0.00030	<0.00030	<0.00030 *
Copper	mg/L	1	0.00068	0.0020	0.0018	0.0015	0.0058	0.004 *
Lead	mg/L	0.01	0.00022	<0.00020	0.0012	<0.00020	0.00083	<0.060 *
Manganese	mg/L	0.05	n/a	n/a	n/a	0.0098	<0.0040	<0.0040 *
Mercury	mg/L	0.001	0.0000021	<0.000010	<0.0000050	<0.0000050	<0.0000020	-
Molybdenum	mg/L	-	0.0036	0.0034	0.0029	0.0020	0.0035	0.0026 *
Nickel	mg/L	-	0.0029	0.0019	0.0024	0.0017	0.0039	8.5 *
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.00020	<0.00020	0.0019 *
Uranium	mg/L	0.02	n/a	n/a	n/a	0.00063	0.00065	0.00063 *
Zinc	mg/L	5	0.0039	0.0064	0.013	<0.0030	<0.0030	0.0032 *

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Lab Filtered (*)

Not measured (NM)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.73
Volume Purged (L)	23 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	2.035

Table 5.26B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	MW 26B					
				May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements									
Field pH	-	6.5-8.5	-	7.35	5.62	7.7	7.5	7.63	7.4
Field EC	mS		-	2.79	7.14	5.28	7.45	6.45	7.81
Field Temperature	°C		-	9.2	8.1	5.8	9.1	8.9	5.9
Routine Water									
pH	-	6.5-8.5	6.5 - 8.5	8.05	8.37	8.09	7.93	8.15	8.19
Conductivity (EC)	µS/cm	1000	-	6300	6400	6100	7100	7400	7600
Calcium	mg/L		-	89	74	73	100	110	120
Magnesium	mg/L		-	44	40	36	56	58	66
Sodium	mg/L	200	200	1700	1500	1400	1600	1600	1800
Potassium	mg/L		-	6.4	5.9	5	8.3	7.7	7.5
Iron	mg/L	0.3	0.3	<0.060	<0.060	<0.060	<0.60	<0.060	<0.6
Sulphate	mg/L	128|218|309|429	500	2900	3000	3000	3300	3400	3200
Chloride	mg/L	100	250	<1.0	1.6	1.7	3.5	3.9	4.5
Bicarbonate	mg/L		-	1000	1000	960	1000	990	1000
Carbonate	mg/L		-	<0.50	15	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	3	10	0.043	0.14	0.052	0.23	0.19	0.42
TDS*	mg/L	500	500	5200	5100	4900	5600	5600	5700
Water Nutrients									
Ammonia-N	mg/L		-	0.54	0.51	0.52	0.43	0.43	0.66
TKN	mg/L		-	0.98	1.1	0.89	0.86	0.73	0.99
Hydrocarbons									
Benzene	mg/L	0.005	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L		0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L		-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics									
COD	mg/L		-	29	59	49	24	35	28
DOC	mg/L		-	8.3	8.7	7.3	9.0	10	12
Metals									
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	<0.030	0.0095	0.0072
Antimony	mg/L	0.006	0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	<0.0020	0.00081	0.00077
Barium	mg/L	1	1	0.01	0.01	0.01	<0.10	0.010	<0.1
Boron	mg/L	1	5	n/a	n/a	n/a	0.30	0.32	0.29
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	0.0037	0.000056	<0.000050	<0.00020	<0.000020	<0.00002
Chromium	mg/L		0.05	<0.010	<0.010	<0.010	<0.010	0.0017	<0.001
Cobalt	mg/L		-	<0.0030	<0.0030	<0.0030	<0.0030	0.00087	0.00081
Copper	mg/L	0.007	1	0.0049	<0.0020	<0.0020	<0.0020	0.0014	0.00039
Lead	mg/L	38|0.004|0.0042|0.0	0.01	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.0002
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	0.20	0.20	0.22
Mercury	mg/L	0.00005	0.001	0.0000038	<0.0000050	<0.0000050	<0.0000050	0.0000040	<0.000002
Molybdenum	mg/L		-	0.0022	<0.0020	<0.0020	0.0024	0.0013	0.00087
Nickel	mg/L	054|0.057|0.059|0.0	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0029	0.0013
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	<0.0020	<0.00020	<0.0002
Uranium	mg/L	0.01	0.02	n/a	n/a	n/a	0.001	0.0012	0.00082
Zinc	mg/L	0.03	5	<0.030	<0.030	<0.030	<0.030	0.0084	<0.003
Polycyclic Aromatic Hydrocarbons (PAHs)									
Benzo[a]pyrene equivalency	mg/L	0.00001	-	n/a	n/a	n/a	0.0037	<0.000010	<0.000010
2-methylnaphthalene	mg/L		-	n/a	n/a	n/a	0.0019	<0.00010	<0.00010
Acenaphthene	mg/L	0.0058	-	n/a	n/a	n/a	0.0019	<0.00010	<0.00010
Acenaphthylene	mg/L		-	n/a	n/a	n/a	0.0020	<0.00010	<0.00010
Acridine	mg/L		-	n/a	n/a	n/a	0.0014	<0.00020	<0.00020
Anthracene	mg/L	0.000012	-	n/a	n/a	n/a	0.0020	<0.000010	<0.000010
Benz(a)anthracene	mg/L	0.000018	-	n/a	n/a	n/a	0.0016	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	0.000017	0.00001	n/a	n/a	n/a	0.0015	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L		-	n/a	n/a	n/a	0.0026	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L		-	n/a	n/a	n/a	0.0017	<0.000050	<0.000050
Benzo(e)pyrene	mg/L		-	n/a	n/a	n/a	0.0014	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L		-	n/a	n/a	n/a	0.0014	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L		-	n/a	n/a	n/a	0.0015	<0.0000085	<0.0000085
Chrysene	mg/L		-	n/a	n/a	n/a	0.0015	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L		-	n/a	n/a	n/a	0.0014	<0.0000075	<0.0000075
Fluoranthene	mg/L	0.00004	-	n/a	n/a	n/a	0.0018	<0.000010	<0.000010
Fluorene	mg/L	0.003	-	n/a	n/a	n/a	0.0018	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L		-	n/a	n/a	n/a	0.0014	<0.0000085	<0.0000085
Naphthalene	mg/L	0.001	-	n/a	n/a	n/a	0.0020	<0.00010	<0.00010
Perylene	mg/L		-	n/a	n/a	n/a	0.0015	<0.000050	<0.000050
Phenanthrene	mg/L	0.0004	-	n/a	n/a	n/a	0.0019	<0.000050	<0.000050
Pyrene	mg/L	0.000025	-	n/a	n/a	n/a	0.0019	<0.000020	<0.000020
Quinoline	mg/L		-	n/a	n/a	n/a	0.0019	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	6.02
Volume Purged (L)	26.0
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	1.644

Table 5.27A: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 27A					
			May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	8.35	6.03	8.3	8.9	8.62	8.5
Field EC	mS	-	1.3	3.66	2.89	2.88	2.86	2.81
Field Temperature	°C	-	8.1	6.3	7.0	10.3	6.2	8.2
Routine Water								
pH	-	6.5 - 8.5	8.45	8.64	8.52	8.38	8.57	8.6
Conductivity (EC)	µS/cm	-	2700	2800	2800	2900	2800	2900
Calcium	mg/L	-	9.7	8.2	9.0	8.5	8.5	8.7
Magnesium	mg/L	-	1.5	1.4	1.2	1.1	1.0	1
Sodium	mg/L	200	740	670	730	690	620	700
Potassium	mg/L	-	2.3	2.3	2.1	2.5	2.2	2.3
Iron	mg/L	0.3	1.1	<0.060	0.46	<0.060	<0.060	<0.060
Sulphate	mg/L	500	630	730	770	730	710	720
Chloride	mg/L	250	4.4	5.8	6.2	5.2	5.0	6.9
Bicarbonate	mg/L	-	940	910	920	930	850	920
Carbonate	mg/L	-	14	35	27	7.5	21	26
Nitrate (N)	mg/L	10	0.093	0.14	0.11	0.046	0.21	0.47
TDS*	mg/L	500	1900	1900	2000	1900	1800	1900
Water Nutrients								
Ammonia-N	mg/L	-	0.87	0.85	0.97	0.63	0.86	0.86
TKN	mg/L	-	1.4	1.4	1.2	1.2	0.76	1.2
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	48	49	43	34	39	30
DOC	mg/L	-	9.5	10	11	11	11	14
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	0.0043	0.073	0.029
Antimony	mg/L	0.006	<0.0030	0.0017	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	0.0024	0.0028	0.003
Barium	mg/L	1	0.044	0.013	0.025	0.011	0.014	0.016
Boron	mg/L	5	n/a	n/a	n/a	0.77	0.75	0.83
Cadmium	mg/L	0.005	0.000027	0.000026	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0050	<0.0010	0.0031	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0015	<0.00030	0.00066	<0.00030	0.00043	<0.00030
Copper	mg/L	1	0.0038	0.0014	0.0019	0.00053	0.00098	0.0003
Lead	mg/L	0.01	0.0015	<0.00020	0.00077	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.013	0.011	0.012
Mercury	mg/L	0.001	0.0000022	<0.0000050	<0.0000050	<0.0000050	0.0000021	<0.0000020
Molybdenum	mg/L	-	0.0031	0.0028	0.0019	0.0013	0.0023	0.0019
Nickel	mg/L	-	0.0068	0.002	0.003	0.0012	0.0033	0.0014
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	0.00055	0.00065	0.00057
Zinc	mg/L	5	<0.015	0.0057	0.0049	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	10.918
Volume Purged (L)	21 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	0.498

Table 5.27B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 27B					
			May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements								
Field pH	-	-	7.62	6.2	7.5	8.1	7.74	7.6
Field EC	mS	-	4.53	12.45	11.56	11.53	11.53	11.41
Field Temperature	°C	-	10.9	10.1	9.8	9.1	7.8	8.3
Routine Water								
pH	-	6.5 - 8.5	8.07	8.38	8.14	7.97	8.19	8.1
Conductivity (EC)	µS/cm	-	10000	11000	11,000	11,000	11,000	12,000
Calcium	mg/L	-	130	110	130	130	140	140
Magnesium	mg/L	-	96	96	110	100	100	130
Sodium	mg/L	200	2900	2900	2800	2700	2700	3100
Potassium	mg/L	-	9.5	9.3	9.2	11	11	11
Iron	mg/L	0.3	0.088	<0.060	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	5600	6000	6100	5100	5300	5100
Chloride	mg/L	250	36	37	40	35	42	51
Bicarbonate	mg/L	-	1500	1600	1700	1700	1600	1900
Carbonate	mg/L	-	<0.50	27	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.11	0.35	0.29	1.1	0.91	1.5
TDS*	mg/L	500	9500	9900	10,000	9000	9100	9400
Water Nutrients								
Ammonia-N	mg/L	-	0.6	0.53	0.51	0.15	0.42	0.67
TKN	mg/L	-	1.4	0.49	1.5	1.0	0.55	1.4
Hydrocarbons								
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics								
COD	mg/L	-	43	42	64	35	37	43
DOC	mg/L	-	12	14	13	13	15	18
Metals								
Aluminum	mg/L	0.1	n/a	n/a	n/a	<0.060	0.0056	0.01
Antimony	mg/L	0.006	<0.012	<0.012	<0.012	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	<0.0040	0.0020	0.0019
Barium	mg/L	1	0.013	0.013	<0.10	<0.10	<0.010	<0.1
Boron	mg/L	5	n/a	n/a	n/a	0.42	0.43	0.46
Cadmium	mg/L	0.005	<0.10	0.00011	<0.0001	<0.00040	0.00004	0.000022
Chromium	mg/L	0.05	<0.020	<0.020	<0.020	<0.020	0.0011	<0.0010
Cobalt	mg/L	-	<0.0060	<0.0060	<0.0060	<0.0060	0.0011	0.0012
Copper	mg/L	1	0.0073	<0.0040	<0.0040	<0.0040	0.0010	<0.00020
Lead	mg/L	0.01	<0.0040	<0.0040	<0.0040	<0.0040	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	0.052	0.052	0.062
Mercury	mg/L	0.001	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.0040	<0.0040	<0.0040	<0.0040	0.0022	0.0018
Nickel	mg/L	-	<0.010	<0.010	<0.010	<0.010	0.0077	0.0051
Selenium	mg/L	0.05	n/a	n/a	n/a	<0.0040	0.00039	0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	0.0021	0.0025	0.0034
Zinc	mg/L	5	<0.060	<0.060	<0.060	<0.060	0.0048	<0.0030
Polycyclic Aromatic Hydrocarbons (PAHs)								
Benzo[a]pyrene equivalency	mg/L	-	n/a	n/a	n/a	n/a	<0.000010	<0.000010
2-methylnaphthalene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthylene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acridine	mg/L	-	n/a	n/a	n/a	n/a	<0.00020	<0.000050
Anthracene	mg/L	-	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	0.00001	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(e)pyrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Chrysene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Fluorene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	-	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Naphthalene	mg/L	-	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Perylene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Pyrene	mg/L	-	n/a	n/a	n/a	n/a	<0.000020	<0.000020
Quinoline	mg/L	-	n/a	n/a	n/a	n/a	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	0.957
Volume Purged (L)	22 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	0.957

Table 5.28A: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 28A				
			1-Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	8.28	8.4	8.4	8.51	8.5
Field EC	mS	-	3.66	3.63	3.59	3.38	3.49
Field Temperature	°C	-	10	6.2	8.5	7.7	6.7
Routine Water							
pH	-	6.5 - 8.5	8.48	8.46	8.34	8.54	8.47
Conductivity (EC)	µS/cm	-	3400	3400	3400	3300	3300
Calcium	mg/L	-	14	13	13	12	13
Magnesium	mg/L	-	1.5	1.4	1.3	1.1	1.2
Sodium	mg/L	200	820	850	870	800	810
Potassium	mg/L	-	2.6	2.5	3.1	2.6	2.7
Iron	mg/L	0.3	<0.060	0.29	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1200	1200	1100	1000	1000
Chloride	mg/L	250	5	5.3	5.0	5.2	5
Bicarbonate	mg/L	-	820	830	850	780	850
Carbonate	mg/L	-	18	19	3.4	16	13
Nitrate (N)	mg/L	10	0.037	0.027	<0.010	0.066	0.044
TDS*	mg/L	500	2400	2500	2400	2200	2300
Water Nutrients							
Ammonia-N	mg/L	-	1.2	1.3	1.1	1.2	1.4
TKN	mg/L	-	1.6	1.6	1.6	1.7	1.6
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	47	42	39	31	28
DOC	mg/L	-	11	9.6	8.5	10	12
Metals							
Aluminum	mg/L	0.1	n/a	n/a	0.0046	0.012	0.005
Antimony	mg/L	0.006	0.00061	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	0.001	0.00084	0.00053
Barium	mg/L	1	0.013	0.015	<0.010	<0.010	<0.010
Boron	mg/L	5	n/a	n/a	0.74	0.77	0.82
Cadmium	mg/L	0.005	<0.000025	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00069	0.00062	<0.00030	0.00039	<0.00030
Copper	mg/L	1	0.0013	0.0021	0.00044	0.00085	<0.00020
Lead	mg/L	0.01	<0.00020	0.00022	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.029	<0.0040	0.019
Mercury	mg/L	0.001	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0035	0.0026	0.0021	0.0017	0.0016
Nickel	mg/L	-	0.0027	0.0024	0.0014	0.0018	0.00082
Selenium	mg/L	0.05	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	0.00056	0.00031	0.00025
Zinc	mg/L	5	<0.0030	0.0039	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	11.773
Volume Purged (L)	20 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.005

Table 5.28B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 28B				
			Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	7.55	7.4	7.8	7.58	7.5
Field EC	mS	-	11.63	12.78	13.02	12.86	12.89
Field Temperature	°C	-	9.1	6.5	7.2	7.8	6.2
Routine Water							
pH	-	6.5 - 8.5	8.07	8.08	7.9	8.14	8.08
Conductivity (EC)	µS/cm	-	12000	12000	12,000	13,000	12,000
Calcium	mg/L	-	210	230	220	210	220
Magnesium	mg/L	-	60	89	95	93	100
Sodium	mg/L	200	2700	3200	3000	2800	3200
Potassium	mg/L	-	9.4	11	13	13	12
Iron	mg/L	0.3	<0.060	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	6500	6900	6500	6700	5700
Chloride	mg/L	250	34	37	35	33	30
Bicarbonate	mg/L	-	1000	1100	1100	1000	1100
Carbonate	mg/L	-	<0.5	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.16	0.075	0.24	0.31	<0.22
TDS*	mg/L	500	10,000	11,000	10,000	10,000	9,700
Water Nutrients							
Ammonia-N	mg/L	-	2	1.6	1.2	1.4	1.6
TKN	mg/L	-	2.8	2.5	2.0	2.1	2.1
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	45	61	45	48	35
DOC	mg/L	-	19	15	16	17	17
Metals							
Aluminum	mg/L	0.1	n/a	n/a	<0.060	0.011	0.0039
Antimony	mg/L	0.006	0.00091	<0.012	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	<0.0040	0.00044	0.0004
Barium	mg/L	1	0.033	<0.10	<0.10	0.010	<0.10
Boron	mg/L	5	n/a	n/a	0.44	0.45	0.44
Cadmium	mg/L	0.005	0.00027	<0.00010	<0.00040	0.000034	0.000022
Chromium	mg/L	0.05	<0.0010	<0.020	<0.020	0.0012	<0.0010
Cobalt	mg/L	-	0.0051	<0.0060	<0.0060	0.0019	0.0015
Copper	mg/L	1	0.0021	<0.0040	<0.0040	0.0015	0.00033
Lead	mg/L	0.01	<0.00020	<0.0040	<0.0040	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.27	0.25	0.25
Mercury	mg/L	0.001	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0029	<0.0040	<0.0040	0.0009	0.00078
Nickel	mg/L	-	0.012	<0.010	<0.010	0.0049	0.0038
Selenium	mg/L	0.05	n/a	n/a	<0.0040	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	<0.0020	0.00062	0.00054
Zinc	mg/L	5	0.0037	<0.060	<0.060	0.0052	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - May 2017

Date	30-May-17
Well Depth (mbtoc)	7.103
Volume Purged (L)	23 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	1.848

Table 5.29A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 29A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.5	8.15	8.1
Field EC	mS	-	4.74	3.44	3.74
Field Temperature	°C	-	6.7	7.0	6.5
Routine Water					
pH	-	6.5 - 8.5	8.28	8.41	8.34
Conductivity (EC)	µS/cm	-	4900	3400	3400
Calcium	mg/L	-	72	33	32
Magnesium	mg/L	-	9.9	5.1	5.2
Sodium	mg/L	200	1200	810	810
Potassium	mg/L	-	7.4	4.1	4.1
Iron	mg/L	0.3	<0.060	<0.060	<0.060
Sulphate	mg/L	500	2000	1200	1100
Chloride	mg/L	250	7.3	3.3	3.6
Bicarbonate	mg/L	-	680	710	760
Carbonate	mg/L	-	<0.50	7.7	3
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.054	0.063	0.33
Nitrite (N)	mg/L	-	0.084	0.014	1.1
Nitrate and Nitrate (N)	mg/L	-	0.14	0.077	-
TDS*	mg/L	500	3600	2400	2400
Hardness	mg/L	-	220	100	100
Alkalinity (total as CaCO3)	mg/L	-	560	590	630
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	6.4	2.5
Ionic Balance	N/A	-	1.0	1.0	2
Water Nutrients					
Ammonia-N	mg/L	-	4.3	1.2	1.4
TKN	mg/L	-	16	1.3	1.6
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	1100	55	25
DOC	mg/L	-	13	8.3	9.1
Metals					
Aluminum	mg/L	0.1	0.0048	0.0067	0.0079
Antimony	mg/L	0.006	0.0012	<0.00060	0.23
Arsenic	mg/L	0.01	0.0030	0.0011	0.00093
Barium	mg/L	1	0.021	0.015	0.018
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.50	0.75	0.74
Cadmium	mg/L	0.005	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00044	0.00061	0.00046
Copper	mg/L	1	0.0012	0.0020	0.00093
Lead	mg/L	0.01	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.081	0.064	0.06
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	0.0091	0.0017	0.0019
Nickel	mg/L	-	0.0036	0.0020	0.0014
Phosphorus	mg/L	-	<0.10	<0.10	<0.10
Selenium	mg/L	0.05	0.00039	0.00022	0.00027
Silicon	mg/L	-	1.7	3.6	3.7
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	1.4	0.67	0.68
Sulphur	mg/L	-	740	400	390
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0093	0.0006	0.00055
Vanadium	mg/L	-	<0.0010	0.0011	<0.0010
Zinc	mg/L	5	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	10.240
Volume Purged (L)	23 (de=ry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.878

Table 5.29B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 29B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	7.4	7.21	7.2
Field EC	mS	-	8.67	8.80	9.23
Field Temperature	°C	-	7.1	7.7	6
Routine Water					
pH	-	6.5 - 8.5	7.62	7.85	7.9
Conductivity (EC)	µS/cm	-	8200	8400	8500
Calcium	mg/L	-	520	560	530
Magnesium	mg/L	-	260	230	240
Sodium	mg/L	200	1400	1600	1600
Potassium	mg/L	-	12	11	11
Iron	mg/L	0.3	<0.60	0.54	<0.60
Sulphate	mg/L	500	4700	5100	4700
Chloride	mg/L	250	5.7	5.2	6
Bicarbonate	mg/L	-	570	520	550
Carbonate	mg/L	-	<0.50	<0.50	0<0.5
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.39	0.11	<0.22
Nitrite (N)	mg/L	-	0.027	0.025	<0.16
Nitrate and Nitrate (N)	mg/L	-	0.42	0.13	-
TDS*	mg/L	500	7200	7700	7400
Hardness	mg/L	-	2300	2400	2300
Alkalinity (total as CaCO3)	mg/L	-	470	420	450
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	1.0	1.0	4.6
Water Nutrients					
Ammonia-N	mg/L	-	0.72	1.1	1.4
TKN	mg/L	-	4.5	0.96	1.8
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	150	41	45
DOC	mg/L	-	17	15	18
Metals					
Aluminum	mg/L	0.1	0.0041	0.022	0.01
Antimony	mg/L	0.006	0.0017	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0077	0.00054	0.00031
Barium	mg/L	1	<0.10	0.019	<0.10
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	<0.20	0.20	0.21
Cadmium	mg/L	0.005	0.00017	0.000082	0.00006
Chromium	mg/L	0.05	<0.0010	0.0014	<0.0010
Cobalt	mg/L	-	0.018	0.0056	0.0044
Copper	mg/L	1	0.0019	0.0019	0.00098
Lead	mg/L	0.01	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.55	0.65	0.67
Manganese	mg/L	0.05	0.77	0.85	0.88
Mercury	mg/L	0.001	<0.0000050	0.0000043	<0.0000020
Molybdenum	mg/L	-	0.016	0.00045	0.00057
Nickel	mg/L	-	0.048	0.0099	0.0075
Phosphorus	mg/L	-	<1.0	<0.10	<1.0
Selenium	mg/L	0.05	0.001	<0.00020	<0.00020
Silicon	mg/L	-	4.4	5.3	5.6
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	6.9	7.9	8
Sulphur	mg/L	-	1600	1800	1700
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.019	0.0042	0.0061
Vanadium	mg/L	-	<0.0010	0.0015	<0.0010
Zinc	mg/L	5	0.014	0.0051	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	5.46
Volume Purged (L)	15 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.92

Table 5.30A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 30A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.5	8.29	8.2
Field EC	mS	-	2.40	2.32	2.02
Field Temperature	°C	-	7.5	8.7	7
Routine Water					
pH	-	6.5 - 8.5	8.34	8.37	8.57
Conductivity (EC)	µS/cm	-	2300	2200	1900
Calcium	mg/L	-	16	12	8.9
Magnesium	mg/L	-	2.2	1.6	1.4
Sodium	mg/L	200	540	540	460
Potassium	mg/L	-	2.9	2.4	2.2
Iron	mg/L	0.3	0.44	0.63	<0.06
Sulphate	mg/L	500	510	510	360
Chloride	mg/L	250	5.3	3.0	1.3
Bicarbonate	mg/L	-	770	780	770
Carbonate	mg/L	-	3.5	5.3	17
Hydroxide	mg/L	-	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	0.013	0.16	0.19
Nitrite (N)	mg/L	-	<0.033	0.046	0.081
Nitrate and Nitrate (N)	mg/L	-	0.023	0.21	-
TDS*	mg/L	500	1500	1500	1200
Hardness	mg/L	-	48	36	28
Alkalinity (total as CaCO3)	mg/L	-	640	650	660
Alkalinity (pp as CaCO3)	mg/L	-	2.9	4.5	14
Ionic Balance	N/A	-	1.0	1.0	0.27
Water Nutrients					
Ammonia-N	mg/L	-	0.78	0.42	0.46
TKN	mg/L	-	2.6	1.1	0.8
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	130	43	23
DOC	mg/L	-	15	9.9	7.8
Metals					
Aluminum	mg/L	0.1	1.0	3.8	0.011
Antimony	mg/L	0.006	0.0008	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0037	0.0030	0.00089
Barium	mg/L	1	0.028	0.025	0.015
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.43	0.52	0.40
Cadmium	mg/L	0.005	0.00004	0.000026	<0.000020
Chromium	mg/L	0.05	0.0016	0.0045	<0.0010
Cobalt	mg/L	-	0.0012	0.0012	<0.00030
Copper	mg/L	1	0.0056	0.0075	0.00034
Lead	mg/L	0.01	0.00077	0.00054	<0.00020
Lithium	mg/L	-	0.11	0.13	0.16
Manganese	mg/L	0.05	0.081	0.059	0.018
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.013	0.0082	0.0015
Nickel	mg/L	-	0.013	0.010	0.0023
Phosphorus	mg/L	-	<0.10	0.11	0.1
Selenium	mg/L	0.05	0.0012	0.00064	<0.00020
Silicon	mg/L	-	3.4	3.7	3.9
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.15	0.13	0.14
Sulphur	mg/L	-	190	170	120
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	0.033	0.084	<0.0010
Uranium	mg/L	0.02	0.0063	0.0035	0.00018
Vanadium	mg/L	-	0.0034	0.0090	0.011
Zinc	mg/L	5	0.0034	0.0037	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	8.85
Volume Purged (L)	20 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	3.475

Table 5.30B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 30B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.1	8.19	7.9
Field EC	mS	-	2.83	2.65	2.68
Field Temperature	°C	-	6.5	7.4	5.6
Routine Water					
pH	-	6.5 - 8.5	8.06	8.44	8.32
Conductivity (EC)	µS/cm	-	2700	2600	2500
Calcium	mg/L	-	29	26	24
Magnesium	mg/L	-	9.1	9.5	8.9
Sodium	mg/L	200	680	610	560
Potassium	mg/L	-	3.3	3.2	2.9
Iron	mg/L	0.3	<0.060	<0.060	<0.060
Sulphate	mg/L	500	830	830	750
Chloride	mg/L	250	1.4	1.5	1.8
Bicarbonate	mg/L	-	670	610	680
Carbonate	mg/L	-	<0.50	8.0	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	1.3	0.12	1.5
Nitrite (N)	mg/L	-	<0.010	0.012	<0.033
Nitrate and Nitrate (N)	mg/L	-	1.3	0.13	-
TDS*	mg/L	500	1900	1800	1700
Hardness	mg/L	-	110	100	97
Alkalinity (total as CaCO3)	mg/L	-	550	520	560
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	6.7	<0.5
Ionic Balance	N/A	-	1.1	1.0	0.76
Water Nutrients					
Ammonia-N	mg/L	-	0.16	<0.050	<0.015
TKN	mg/L	-	0.49	0.40	0.6
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	110	44	38
DOC	mg/L	-	8.4	9.1	10
Metals					
Aluminum	mg/L	0.1	<0.030	0.011	0.0039
Antimony	mg/L	0.006	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.01	0.0024	0.0010	0.00068
Barium	mg/L	1	0.022	0.022	0.024
Beryllium	mg/L	-	<0.010	<0.0010	<0.001
Boron	mg/L	5	0.11	0.14	0.12
Cadmium	mg/L	0.005	<0.00020	<0.000020	<0.00002
Chromium	mg/L	0.05	<0.010	0.0012	<0.001
Cobalt	mg/L	-	<0.0030	<0.00030	<0.0003
Copper	mg/L	1	0.0035	0.0024	0.00083
Lead	mg/L	0.01	<0.0020	<0.00020	<0.0002
Lithium	mg/L	-	0.21	0.24	0.24
Manganese	mg/L	0.05	0.068	<0.0040	<0.004
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	0.0028	0.0011	0.00092
Nickel	mg/L	-	0.0053	0.0023	0.001
Phosphorus	mg/L	-	<0.10	<0.10	0.13
Selenium	mg/L	0.05	<0.0020	0.00024	0.00046
Silicon	mg/L	-	4.6	4.7	4.8
Silver	mg/L	-	<0.0010	<0.00010	<0.0001
Strontium	mg/L	-	0.37	0.33	0.35
Sulphur	mg/L	-	260	290	250
Thallium	mg/L	-	<0.0020	<0.00020	<0.0002
Tin	mg/L	-	<0.010	<0.0010	<0.001
Titanium	mg/L	-	<0.010	<0.0010	<0.001
Uranium	mg/L	0.02	0.0053	0.0032	0.0038
Vanadium	mg/L	-	<0.010	0.0019	<0.001
Zinc	mg/L	5	<0.030	0.0064	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	5.433
Volume Purged (L)	10 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	3.440

Table 5.31A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 31A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.6	8.53	-
Field EC	mS	-	1.98	1.72	-
Field Temperature	°C	-	10.5	9.5	-
Routine Water					
pH	-	6.5 - 8.5	8.57	8.53	8.57
Conductivity (EC)	µS/cm	-	1900	1800	1700
Calcium	mg/L	-	7.8	4.5	4.9 *
Magnesium	mg/L	-	3.1	<2.0	0.52 *
Sodium	mg/L	200	420	430	470
Potassium	mg/L	-	3.2	<3.0	1.9 *
Iron	mg/L	0.3	9.0	<0.60	0.18 *
Sulphate	mg/L	500	220	120	76
Chloride	mg/L	250	12	6.7	5.2
Bicarbonate	mg/L	-	920	940	1000
Carbonate	mg/L	-	22	18	23
Hydroxide	mg/L	-	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	0.017	2.0	14
Nitrite (N)	mg/L	-	0.013	0.028	0.077
Nitrate and Nitrate (N)	mg/L	-	0.03	2.0	3.2
TDS*	mg/L	500	1100	1000	1100
Hardness	mg/L	-	32	11	15
Alkalinity (total as CaCO3)	mg/L	-	790	800	880
Alkalinity (pp as CaCO3)	mg/L	-	19	15	19
Ionic Balance	N/A	-	0.94	1.0	3.2
Water Nutrients					
Ammonia-N	mg/L	-	1.1	1.1	1.2
TKN	mg/L	-	5.2	1.0	7.4
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	560	380	300
DOC	mg/L	-	19	17	-
Metals					
Aluminum	mg/L	0.1	1.5	0.31	0.55 *
Antimony	mg/L	0.006	0.0013	<0.00060	0.00077 *
Arsenic	mg/L	0.01	0.0069	0.00088	0.0042 *
Barium	mg/L	1	0.097	<0.10	0.085 *
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010 *
Boron	mg/L	5	0.58	0.66	0.74 *
Cadmium	mg/L	0.005	0.000048	<0.000020	0.000025 *
Chromium	mg/L	0.05	0.0017	<0.0010	<0.0010 *
Cobalt	mg/L	-	0.0034	0.00039	0.0016 *
Copper	mg/L	1	0.0093	0.00093	0.0046 *
Lead	mg/L	0.01	0.0021	0.00043	0.00043 *
Lithium	mg/L	-	0.064	<0.20	0.086 *
Manganese	mg/L	0.05	0.068	<0.040	0.036 *
Mercury	mg/L	0.001	0.000008	0.000043	<0.0000020 *
Molybdenum	mg/L	-	0.023	0.0021	0.019 *
Nickel	mg/L	-	0.020	0.0026	0.012 *
Phosphorus	mg/L	-	0.12	<1.0	<0.10 *
Selenium	mg/L	0.05	0.0013	<0.00020	0.00078 *
Silicon	mg/L	-	55	2.7	3.1 *
Silver	mg/L	-	<0.00010	<0.00010	<0.00010 *
Strontium	mg/L	-	0.10	<0.20	0.11 *
Sulphur	mg/L	-	75	40	24 *
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020 *
Tin	mg/L	-	<0.0010	<0.0010	<0.0010 *
Titanium	mg/L	-	0.030	0.0032	0.0094 *
Uranium	mg/L	0.02	0.0095	0.00054	0.0041 *
Vanadium	mg/L	-	0.0028	<0.0010	0.0013 *
Zinc	mg/L	5	0.0051	<0.0030	<0.0030 *

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Laboratory filtered (*)

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	9.660
Volume Purged (L)	20 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	2.413

Table 5.31B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 31B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.4	8.33	8.1
Field EC	mS	-	2.53	2.50	2.66
Field Temperature	°C	-	8.0	9.4	8.1
Routine Water					
pH	-	6.5 - 8.5	8.29	8.56	8.4
Conductivity (EC)	µS/cm	-	2400	2500	2500
Calcium	mg/L	-	15	15	14
Magnesium	mg/L	-	4.3	5.4	5.6
Sodium	mg/L	200	550	590	570
Potassium	mg/L	-	3.7	3.6	3.3
Iron	mg/L	0.3	0.75	0.26	<0.060
Sulphate	mg/L	500	670	750	780
Chloride	mg/L	250	1.1	1.4	1.4
Bicarbonate	mg/L	-	690	610	640
Carbonate	mg/L	-	<0.50	13	5.2
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.046	<0.010	0.8
Nitrite (N)	mg/L	-	<0.010	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	0.046	<0.020	-
TDS*	mg/L	500	1600	1700	1700
Hardness	mg/L	-	55	59	59
Alkalinity (total as CaCO3)	mg/L	-	570	520	530
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	11	4.3
Ionic Balance	N/A	-	0.99	1.0	1.7
Water Nutrients					
Ammonia-N	mg/L	-	0.59	0.13	0.034
TKN	mg/L	-	2.2	0.38	0.51
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	0.12	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	140	28	30
DOC	mg/L	-	9	8.2	8.8
Metals					
Aluminum	mg/L	0.1	0.70	0.084	0.011
Antimony	mg/L	0.006	0.00095	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0094	0.0017	0.0011
Barium	mg/L	1	0.024	0.023	0.022
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.16	0.20	0.17
Cadmium	mg/L	0.005	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0021	0.00053	<0.0003
Copper	mg/L	1	0.0022	0.0022	0.00027
Lead	mg/L	0.01	0.00048	<0.00020	<0.00020
Lithium	mg/L	-	0.12	0.16	0.15
Manganese	mg/L	0.05	0.061	0.041	0.017
Mercury	mg/L	0.001	<0.0000050	0.0000027	<0.0000020
Molybdenum	mg/L	-	0.0058	0.0015	0.0014
Nickel	mg/L	-	0.0086	0.0033	0.00081
Phosphorus	mg/L	-	<0.10	<0.10	0.13
Selenium	mg/L	0.05	0.00064	<0.00020	<0.00020
Silicon	mg/L	-	5.2	3.9	3.6
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.17	0.23	0.24
Sulphur	mg/L	-	220	270	250
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	0.018	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0034	0.00099	0.0012
Vanadium	mg/L	-	0.0024	0.0011	<0.0010
Zinc	mg/L	5	<0.0030	0.0078	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	3.880
Volume Purged (L)	10 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.104

Table 5.32A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 32A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.2	7.79	7.6
Field EC	mS	-	8.66	7.91	8.49
Field Temperature	°C	-	7.6	8.2	7.3
Routine Water					
pH	-	6.5 - 8.5	8.16	8.25	8.12
Conductivity (EC)	µS/cm	-	8200	8100	8000
Calcium	mg/L	-	120	120	120
Magnesium	mg/L	-	15	15	15
Sodium	mg/L	200	2000	2000	2000
Potassium	mg/L	-	11	8.4	7.7
Iron	mg/L	0.3	<0.60	0.12	<0.60
Sulphate	mg/L	500	4100	3900	3400
Chloride	mg/L	250	8.9	3.1	3.2
Bicarbonate	mg/L	-	960	980	1000
Carbonate	mg/L	-	<0.50	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.050	<0.22
Nitrite (N)	mg/L	-	0.013	<0.050	0.71
Nitrate and Nitrate (N)	mg/L	-	0.013	<0.020	-
TDS*	mg/L	500	6700	6500	6100
Hardness	mg/L	-	370	360	350
Alkalinity (total as CaCO3)	mg/L	-	790	800	850
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	0.92	1.0	4.4
Water Nutrients					
Ammonia-N	mg/L	-	3.5	2.9	3.2
TKN	mg/L	-	6.8	3.2	3.2
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	410	26	19
DOC	mg/L	-	12	7.9	7.2
Metals					
Aluminum	mg/L	0.1	<0.030	0.029	0.008
Antimony	mg/L	0.006	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0041	0.00051	0.00037
Barium	mg/L	1	<0.10	0.015	<0.10
Beryllium	mg/L	-	<0.010	<0.0010	<0.0010
Boron	mg/L	5	0.85	1.2	1.2
Cadmium	mg/L	0.005	<0.00020	<0.000020	0.000021
Chromium	mg/L	0.05	<0.010	0.0015	<0.0010
Cobalt	mg/L	-	<0.0030	0.00077	0.00062
Copper	mg/L	1	<0.0020	0.0031	0.00073
Lead	mg/L	0.01	<0.0020	<0.00020	<0.00020
Lithium	mg/L	-	0.36	0.47	0.49
Manganese	mg/L	0.05	0.15	0.12	0.14
Mercury	mg/L	0.001	<0.0000050	0.0000023	<0.0000020
Molybdenum	mg/L	-	0.014	0.00054	0.00068
Nickel	mg/L	-	0.011	0.0032	0.0016
Phosphorus	mg/L	-	<1.0	<0.10	<1.0
Selenium	mg/L	0.05	<0.0020	<0.00020	<0.00020
Silicon	mg/L	-	2.4	5.2	5.3
Silver	mg/L	-	<0.0010	<0.00010	<0.00010
Strontium	mg/L	-	2.6	2.9	3.0
Sulphur	mg/L	-	1300	1300	1300
Thallium	mg/L	-	<0.0020	<0.00020	<0.00020
Tin	mg/L	-	<0.010	<0.0010	<0.0010
Titanium	mg/L	-	<0.010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0080	0.00016	0.00014
Vanadium	mg/L	-	<0.010	<0.0010	<0.0010
Zinc	mg/L	5	<0.030	0.015	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	10.115
Volume Purged (L)	32 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.248

Table 5.32B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 32B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	7.7	7.69	7.4
Field EC	mS	-	12.55	13.26	13.01
Field Temperature	°C	-	7.6	9.1	6.8
Routine Water					
pH	-	6.5 - 8.5	7.73	7.97	7.98
Conductivity (EC)	µS/cm	-	12,000	13,000	12,000
Calcium	mg/L	-	210	230	210
Magnesium	mg/L	-	100	120	100
Sodium	mg/L	200	2800	3200	3000
Potassium	mg/L	-	18	17	15
Iron	mg/L	0.3	<0.60	<0.60	<0.60
Sulphate	mg/L	500	6300	6800	5700
Chloride	mg/L	250	110	120	120
Bicarbonate	mg/L	-	1300	1300	1300
Carbonate	mg/L	-	<0.50	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.050	<0.050	<0.22
Nitrite (N)	mg/L	-	<0.050	<0.050	<0.16
Nitrate and Nitrate (N)	mg/L	-	<0.050	<0.020	-
TDS*	mg/L	500	10,000	11,000	9,800
Hardness	mg/L	-	930	1100	950
Alkalinity (total as CaCO3)	mg/L	-	1100	1100	1000
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	0.91	0.97	1.9
Water Nutrients					
Ammonia-N	mg/L	-	1.3	1.5	1.5
TKN	mg/L	-	3.5	2.6	2.3
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	210	78	74
DOC	mg/L	-	18	15	17
Metals					
Aluminum	mg/L	0.1	0.0045	0.0038	0.016
Antimony	mg/L	0.006	0.0016	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.012	0.0016	0.00085
Barium	mg/L	1	<0.10	<0.10	<0.10
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.40	0.48	0.46
Cadmium	mg/L	0.005	0.00011	0.00046	0.000083
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0093	0.0054	0.0028
Copper	mg/L	1	0.0012	0.0036	0.0022
Lead	mg/L	0.01	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.43	0.54	0.47
Manganese	mg/L	0.05	0.68	0.85	0.67
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0089	0.0016	0.0012
Nickel	mg/L	-	0.031	0.013	0.0066
Phosphorus	mg/L	-	<1.0	<1.0	<1.0
Selenium	mg/L	0.05	0.00079	0.00046	<0.00020
Silicon	mg/L	-	3.9	4.7	4.7
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	4.3	5.1	4.7
Sulphur	mg/L	-	2000	2300	2000
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0027	0.00085	0.00084
Vanadium	mg/L	-	<0.0010	<0.0010	<0.0010
Zinc	mg/L	5	0.0055	0.0040	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	4.822
Volume Purged (L)	13 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.314

Table 5.33A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 33A		
			May-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.6	8.66	-
Field EC	mS	-	2.54	2.01	-
Field Temperature	°C	-	6.9	7.0	-
Routine Water					
pH	-	6.5 - 8.5	8.32	8.52	8.52
Conductivity (EC)	µS/cm	-	3300	2100	1800
Calcium	mg/L	-	35	7.4	4.7
Magnesium	mg/L	-	10	1.4	0.7
Sodium	mg/L	200	930	480	390
Potassium	mg/L	-	5.8	2.2	1.4
Iron	mg/L	0.3	<0.060	0.60	<0.060
Sulphate	mg/L	500	860	230	130
Chloride	mg/L	250	28	27	24
Bicarbonate	mg/L	-	1100	990	990
Carbonate	mg/L	-	2.6	16	18
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.010	<0.044
Nitrite (N)	mg/L	-	<0.010	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.010	<0.020	<0.010
TDS*	mg/L	500	2400	1200	1100
Hardness	mg/L	-	130	24	15
Alkalinity (total as CaCO3)	mg/L	-	870	840	840
Alkalinity (pp as CaCO3)	mg/L	-	2.2	13	15
Ionic Balance	N/A	-	1.2	0.96	7.7
Water Nutrients					
Ammonia-N	mg/L	-	1.3	0.89	0.79
TKN	mg/L	-	8.0	2.6	2.4
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	460	140	130
DOC	mg/L	-	39	33	25
Metals					
Aluminum	mg/L	0.1	0.0044	0.66	0.005
Antimony	mg/L	0.006	0.00076	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0089	0.0042	0.0018
Barium	mg/L	1	0.070	0.080	0.053
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.50	0.71	0.68
Cadmium	mg/L	0.005	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0032	0.0016	0.00057
Copper	mg/L	1	0.0017	0.028	<0.00020
Lead	mg/L	0.01	<0.00020	0.00094	<0.00020
Lithium	mg/L	-	0.20	0.089	0.07
Manganese	mg/L	0.05	0.13	0.058	0.027
Mercury	mg/L	0.001	<0.0000050	<0.0000060	<0.0000020
Molybdenum	mg/L	-	0.023	0.018	0.016
Nickel	mg/L	-	0.016	0.0083	0.0022
Phosphorus	mg/L	-	<0.10	0.17	<0.10
Selenium	mg/L	0.05	0.00058	<0.00020	<0.00020
Silicon	mg/L	-	3.5	3.9	3.3
Silver	mg/L	-	<0.00010	<0.00010	<0.0001
Strontium	mg/L	-	0.7	0.16	0.093
Sulphur	mg/L	-	360	64	35
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	0.0095	<0.0010
Uranium	mg/L	0.02	0.0096	0.0035	0.0012
Vanadium	mg/L	-	0.0015	0.0040	0.0014
Zinc	mg/L	5	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	14.643
Volume Purged (L)	25 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	2.113

Table 5.33B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 33B		
			May-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	7.5	7.48	-
Field EC	mS	-	5.18	5.34	-
Field Temperature	°C	-	6.0	6.9	-
Routine Water					
pH	-	6.5 - 8.5	7.89	8.15	7.99
Conductivity (EC)	µS/cm	-	5000	5400	5600
Calcium	mg/L	-	91	110	130
Magnesium	mg/L	-	26	38	42
Sodium	mg/L	200	1200	1300	1200
Potassium	mg/L	-	6.9	6.9	6.1
Iron	mg/L	0.3	<0.060	0.35	<0.6
Sulphate	mg/L	500	1900	2000	2100
Chloride	mg/L	250	21	20	21
Bicarbonate	mg/L	-	1000	1100	1200
Carbonate	mg/L	-	<0.50	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.050	0.68
Nitrite (N)	mg/L	-	<0.010	<0.050	0.2
Nitrate and Nitrate (N)	mg/L	-	<0.010	<0.020	0.21
TDS*	mg/L	500	3700	4000	4100
Hardness	mg/L	-	340	440	490
Alkalinity (total as CaCO3)	mg/L	-	850	920	1000
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	1.0	1.0	0.82
Water Nutrients					
Ammonia-N	mg/L	-	0.83	0.78	0.6
TKN	mg/L	-	5.3	2.6	2.7
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	280	140	150
DOC	mg/L	-	45	44	49
Metals					
Aluminum	mg/L	0.1	0.0056	0.060	0.0049
Antimony	mg/L	0.006	0.0013	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0065	0.0013	0.0014
Barium	mg/L	1	0.038	0.031	<0.10
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.23	0.28	0.25
Cadmium	mg/L	0.005	<0.000020	<0.000020	0.000044
Chromium	mg/L	0.05	<0.0010	0.0020	<0.0010
Cobalt	mg/L	-	0.0030	0.0020	0.0024
Copper	mg/L	1	0.00037	0.0027	0.0028
Lead	mg/L	0.01	<0.00020	0.00024	<0.00020
Lithium	mg/L	-	0.30	0.35	0.37
Manganese	mg/L	0.05	0.19	0.24	0.25
Mercury	mg/L	0.001	<0.0000050	0.00023	0.0000076
Molybdenum	mg/L	-	0.0070	0.00038	0.0008
Nickel	mg/L	-	0.015	0.0096	0.011
Phosphorus	mg/L	-	<0.10	<0.10	<1.0
Selenium	mg/L	0.05	0.00064	0.00038	0.00043
Silicon	mg/L	-	3.9	5.0	4.6
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	1.6	2.1	2.3
Sulphur	mg/L	-	610	720	690
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	0.0033	<0.0010
Uranium	mg/L	0.02	0.0021	0.00016	0.00026
Vanadium	mg/L	-	<0.0010	<0.0010	<0.0010
Zinc	mg/L	5	<0.0030	0.0056	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	5.447
Volume Purged (L)	1.4
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	1.398

Table 5.34A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-34A	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.66	6.9
Field EC	mS	-	3.02	2.46
Field Temperature	°C	-	8.1	6.2
Routine Water				
pH	-	6.5 - 8.5	8.57	8.43
Conductivity (EC)	µS/cm	-	3000	2500
Calcium	mg/L	-	19	12
Magnesium	mg/L	-	4.5	2.2
Sodium	mg/L	200	710	600
Potassium	mg/L	-	4.1	2.6
Iron	mg/L	0.3	0.13	0.31
Sulphate	mg/L	500	510	310
Chloride	mg/L	250	51	25
Bicarbonate	mg/L	-	1200	1200
Carbonate	mg/L	-	25	15
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.050	<0.044
Nitrite (N)	mg/L	-	<0.050	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.010
TDS*	mg/L	500	1900	1600
Hardness	mg/L	-	67	40
Alkalinity (total as CaCO3)	mg/L	-	990	1000
Alkalinity (pp as CaCO3)	mg/L	-	21	12
Ionic Balance	N/A	-	1.0	2.4
Water Nutrients				
Ammonia-N	mg/L	-	1.1	0.94
TKN	mg/L	-	2.6	1.8
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	470	190
DOC	mg/L	-	72	60
Metals				
Aluminum	mg/L	0.1	0.036	0.0049
Antimony	mg/L	0.006	0.00078	<0.00060
Arsenic	mg/L	0.01	0.0030	0.0028
Barium	mg/L	1	0.030	0.039
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.80	0.84
Cadmium	mg/L	0.005	<0.000020	<0.000020
Chromium	mg/L	0.05	0.0010	<0.0010
Cobalt	mg/L	-	0.0010	0.00054
Copper	mg/L	1	0.0019	<0.00020
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.14	0.13
Manganese	mg/L	0.05	0.14	0.13
Mercury	mg/L	0.001	0.000044	<0.0000020
Molybdenum	mg/L	-	0.042	0.012
Nickel	mg/L	-	0.0074	0.0039
Phosphorus	mg/L	-	<0.10	<0.10
Selenium	mg/L	0.05	0.00029	<0.0002
Silicon	mg/L	-	3.2	4.1
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.30	0.24
Sulphur	mg/L	-	170	100
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.018	0.005
Vanadium	mg/L	-	0.0023	0.0011
Zinc	mg/L	5	0.011	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	13.07
Volume Purged (L)	25 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	3.397

Table 5.34B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-34B	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	7.05	6.9
Field EC	mS	-	2.49	2.46
Field Temperature	°C	-	7.9	6.2
Routine Water				
pH	-	6.5 - 8.5	7.65	7.51
Conductivity (EC)	µS/cm	-	2400	2400
Calcium	mg/L	-	180	180
Magnesium	mg/L	-	55	60
Sodium	mg/L	200	320	320
Potassium	mg/L	-	11	9.7
Iron	mg/L	0.3	<0.060	<0.06
Sulphate	mg/L	500	510	470
Chloride	mg/L	250	39	39
Bicarbonate	mg/L	-	1000	1100
Carbonate	mg/L	-	<0.50	<0.5
Hydroxide	mg/L	-	<0.50	<0.5
Nitrate (N)	mg/L	10	0.014	<0.22
Nitrite (N)	mg/L	-	<0.010	<0.16
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.05
TDS*	mg/L	500	1600	1600
Hardness	mg/L	-	670	690
Alkalinity (total as CaCO3)	mg/L	-	840	890
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.5
Ionic Balance	N/A	-	0.96	1.6
Water Nutrients				
Ammonia-N	mg/L	-	0.16	0.069
TKN	mg/L	-	0.89	0.85
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.0004
Toluene	mg/L	0.024	<0.00040	<0.0004
Ethylbenzene	mg/L	0.0016	<0.00040	<0.0004
Xylene	mg/L	0.02	<0.00080	<0.0008
F1 (C6-C10)	mg/L	-	<0.10	<0.1
F2 (>C10-C16)	mg/L	-	<0.10	<0.1
Organics				
COD	mg/L	-	81	35
DOC	mg/L	-	14	13
Metals				
Aluminum	mg/L	0.1	0.0064	<0.003
Antimony	mg/L	0.006	<0.00060	<0.0006
Arsenic	mg/L	0.01	0.00054	0.00034
Barium	mg/L	1	0.054	0.052
Beryllium	mg/L	-	<0.0010	<0.001
Boron	mg/L	5	0.060	0.06
Cadmium	mg/L	0.005	0.00010	0.000056
Chromium	mg/L	0.05	<0.0010	<0.001
Cobalt	mg/L	-	0.0015	<0.0003
Copper	mg/L	1	0.0041	0.002
Lead	mg/L	0.01	<0.00020	<0.0002
Lithium	mg/L	-	0.12	0.12
Manganese	mg/L	0.05	0.11	0.053
Mercury	mg/L	0.001	0.0000025	<0.000002
Molybdenum	mg/L	-	0.0012	0.00054
Nickel	mg/L	-	0.0096	0.0057
Phosphorus	mg/L	-	0.26	<0.1
Selenium	mg/L	0.05	<0.00020	<0.0002
Silicon	mg/L	-	5.6	6.5
Silver	mg/L	-	<0.00010	<0.0001
Strontium	mg/L	-	1.2	1.2
Sulphur	mg/L	-	140	150
Thallium	mg/L	-	<0.00020	<0.0002
Tin	mg/L	-	<0.0010	<0.001
Titanium	mg/L	-	<0.0010	<0.001
Uranium	mg/L	0.02	0.0050	0.0034
Vanadium	mg/L	-	0.0031	<0.001
Zinc	mg/L	5	0.0073	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	5.855
Volume Purged (L)	9 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	2.729

Table 5.35-Deep: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35-DEEP	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.22	8.1
Field EC	mS	-	4.90	3.92
Field Temperature	°C	-	8.9	10
Routine Water				
pH	-	6.5 - 8.5	8.19	8.13
Conductivity (EC)	µS/cm	-	4700	5300
Calcium	mg/L	-	18	20
Magnesium	mg/L	-	2.1	2.1
Sodium	mg/L	200	970	1100
Potassium	mg/L	-	3.3	3.8
Iron	mg/L	0.3	<0.060	<0.060
Sulphate	mg/L	500	25	13
Chloride	mg/L	250	1100	1400
Bicarbonate	mg/L	-	560	500
Carbonate	mg/L	-	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	0.25	<0.22
Nitrite (N)	mg/L	-	<0.010	<0.16
Nitrate and Nitrate (N)	mg/L	-	0.25	<0.050
TDS*	mg/L	500	2400	2800
Hardness	mg/L	-	53	58
Alkalinity (total as CaCO3)	mg/L	-	460	410
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50
Ionic Balance	N/A	-	1.0	2.3
Water Nutrients				
Ammonia-N	mg/L	-	1.1	1.2
TKN	mg/L	-	2.2	2.5
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	110	130
DOC	mg/L	-	18	-
Metals				
Aluminum	mg/L	0.1	0.017	0.0031
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0018	0.00081
Barium	mg/L	1	0.27	0.41
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.69	0.75
Cadmium	mg/L	0.005	0.000040	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00069	0.00052
Copper	mg/L	1	0.00094	0.00048
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.15	0.19
Manganese	mg/L	0.05	0.048	0.053
Mercury	mg/L	0.001	0.0000020	<0.0000020
Molybdenum	mg/L	-	0.021	0.017
Nickel	mg/L	-	0.0038	0.0013
Phosphorus	mg/L	-	<0.10	<0.10
Selenium	mg/L	0.05	0.00020	<0.00020
Silicon	mg/L	-	3.5	3.6
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.36	0.5
Sulphur	mg/L	-	9.2	4.6
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	0.0013
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0023	0.00064
Vanadium	mg/L	-	<0.0010	<0.0010
Zinc	mg/L	5	<0.0030	0.16

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	33.4
Volume Purged (L)	162 (hydosleve)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	6.640

Table 5.35A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35A	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	n/a	n/a
Field EC	mS	-	n/a	n/a
Field Temperature	°C	-	n/a	n/a
Routine Water				
pH	-	6.5 - 8.5	8.60	8.61
Conductivity (EC)	µS/cm	-	1500	1600
Calcium	mg/L	-	3.8	3.6
Magnesium	mg/L	-	0.36	0.34
Sodium	mg/L	200	370	390
Potassium	mg/L	-	2.2	3.1
Iron	mg/L	0.3	0.11	<0.060
Sulphate	mg/L	500	41	21
Chloride	mg/L	250	36	36
Bicarbonate	mg/L	-	900	960
Carbonate	mg/L	-	26	23
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.044
Nitrite (N)	mg/L	-	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.010
TDS*	mg/L	500	930	950
Hardness	mg/L	-	11	10
Alkalinity (total as CaCO3)	mg/L	-	780	830
Alkalinity (pp as CaCO3)	mg/L	-	22	19
Ionic Balance	N/A	-	0.95	2.4
Water Nutrients				
Ammonia-N	mg/L	-	0.83	-
TKN	mg/L	-	12	-
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	0.00049
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.27	<0.27
Organics				
COD	mg/L	-	1100	-
DOC	mg/L	-	15	-
Metals				
Aluminum	mg/L	0.1	0.092	0.055
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0035	0.0023
Barium	mg/L	1	0.080	0.13
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.75	0.74
Cadmium	mg/L	0.005	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00042	0.00035
Copper	mg/L	1	0.0011	0.00065
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.068	0.069
Manganese	mg/L	0.05	0.012	0.013
Mercury	mg/L	0.001	<0.000020	<0.0000020
Molybdenum	mg/L	-	0.020	0.016
Nickel	mg/L	-	0.0053	0.0034
Phosphorus	mg/L	-	0.15	1.2
Selenium	mg/L	0.05	<0.00020	<0.00020
Silicon	mg/L	-	3.7	3.5
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.076	0.086
Sulphur	mg/L	-	11	5.9
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	0.0015	<0.0010
Uranium	mg/L	0.02	0.0013	0.00095
Vanadium	mg/L	-	0.0014	0.0012
Zinc	mg/L	5	0.0035	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	14.560
Volume Purged (L)	16 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	7.549

Table 5.35B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35B	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	7.83	7.8
Field EC	mS	-	8.08	7.27
Field Temperature	°C	-	7.6	8
Routine Water				
pH	-	6.5 - 8.5	8.16	8.22
Conductivity (EC)	µS/cm	-	7700	7600
Calcium	mg/L	-	99	98
Magnesium	mg/L	-	14	14
Sodium	mg/L	200	1800	1800
Potassium	mg/L	-	7.8	8.6
Iron	mg/L	0.3	<0.60	<0.60
Sulphate	mg/L	500	3700	3300
Chloride	mg/L	250	5.2	6.8
Bicarbonate	mg/L	-	790	780
Carbonate	mg/L	-	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	0.42	2.5
Nitrite (N)	mg/L	-	<0.010	<0.16
Nitrate and Nitrate (N)	mg/L	-	0.42	-
TDS*	mg/L	500	6000	5700
Hardness	mg/L	-	300	300
Alkalinity (total as CaCO3)	mg/L	-	650	640
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50
Ionic Balance	N/A	-	0.95	2.3
Water Nutrients				
Ammonia-N	mg/L	-	1.9	2
TKN	mg/L	-	2.7	2.5
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	37	66
DOC	mg/L	-	8.2	12
Metals				
Aluminum	mg/L	0.1	0.012	0.0035
Antimony	mg/L	0.006	0.00069	<0.00060
Arsenic	mg/L	0.01	0.0019	0.0014
Barium	mg/L	1	<0.10	<0.1
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.70	0.71
Cadmium	mg/L	0.005	<0.000020	0.000022
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00065	0.00054
Copper	mg/L	1	0.0018	0.0032
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.50	0.52
Manganese	mg/L	0.05	0.066	0.074
Mercury	mg/L	0.001	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0055	0.0041
Nickel	mg/L	-	0.0041	0.0036
Phosphorus	mg/L	-	<1.0	<1.0
Selenium	mg/L	0.05	0.00082	0.00053
Silicon	mg/L	-	3.1	3.1
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	2.2	2.3
Sulphur	mg/L	-	1200	1200
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0023	0.0015
Vanadium	mg/L	-	<0.0010	<0.0010
Zinc	mg/L	5	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	7.985
Volume Purged (L)	13 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	4.445

Table 5.36-Deep: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-36-DEEP	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.52	8
Field EC	mS	-	3.83	4.84
Field Temperature	°C	-	7.7	10.3
Routine Water				
pH	-	6.5 - 8.5	8.51	8.33
Conductivity (EC)	µS/cm	-	3600	4800
Calcium	mg/L	-	17	18
Magnesium	mg/L	-	2.4	2.1
Sodium	mg/L	200	800	1100
Potassium	mg/L	-	5.4	3.9
Iron	mg/L	0.3	0.41	<0.060
Sulphate	mg/L	500	46	11
Chloride	mg/L	250	770	1100
Bicarbonate	mg/L	-	650	940
Carbonate	mg/L	-	13	3.1
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	0.018	<0.044
Nitrite (N)	mg/L	-	0.043	<0.033
Nitrate and Nitrate (N)	mg/L	-	0.061	<0.01
TDS*	mg/L	500	2000	2600
Hardness	mg/L	-	52	53
Alkalinity (total as CaCO3)	mg/L	-	550	770
Alkalinity (pp as CaCO3)	mg/L	-	11	2.6
Ionic Balance	N/A	-	1.1	2.3
Water Nutrients				
Ammonia-N	mg/L	-	0.92	1.3
TKN	mg/L	-	1.9	2.6
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	99	140
DOC	mg/L	-	12	-
Metals				
Aluminum	mg/L	0.1	0.19	0.0069
Antimony	mg/L	0.006	0.0030	<0.00060
Arsenic	mg/L	0.01	0.0088	0.0024
Barium	mg/L	1	0.23	0.32
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.71	0.97
Cadmium	mg/L	0.005	0.000070	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00082	0.0012
Copper	mg/L	1	0.011	0.0006
Lead	mg/L	0.01	0.00094	<0.00020
Lithium	mg/L	-	0.11	0.19
Manganese	mg/L	0.05	0.030	0.071
Mercury	mg/L	0.001	0.00019	<0.0000020
Molybdenum	mg/L	-	0.041	0.011
Nickel	mg/L	-	0.0086	0.0046
Phosphorus	mg/L	-	0.13	<0.10
Selenium	mg/L	0.05	0.00096	0.0003
Silicon	mg/L	-	2.6	3.6
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.34	0.46
Sulphur	mg/L	-	17	3.3
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	0.003
Titanium	mg/L	-	0.0030	<0.0010
Uranium	mg/L	0.02	0.0066	0.0016
Vanadium	mg/L	-	0.0078	<0.0010
Zinc	mg/L	5	0.0068	0.1

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	35.32
Volume Purged (L)	120 (hydrosleve)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	5.782

Table 5.36A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-36A	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.87	8.8
Field EC	mS	-	1.59	1.63
Field Temperature	°C	-	9.1	6.5
Routine Water				
pH	-	6.5 - 8.5	8.66	8.52
Conductivity (EC)	µS/cm	-	1600	1600
Calcium	mg/L	-	3.9	3.3
Magnesium	mg/L	-	0.41	0.32
Sodium	mg/L	200	390	380
Potassium	mg/L	-	1.4	1.3
Iron	mg/L	0.3	<0.060	<0.060
Sulphate	mg/L	500	<1.0	2.9
Chloride	mg/L	250	7.4	7.1
Bicarbonate	mg/L	-	970	1000
Carbonate	mg/L	-	25	18
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.044
Nitrite (N)	mg/L	-	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.010
TDS*	mg/L	500	900	930
Hardness	mg/L	-	12	9.5
Alkalinity (total as CaCO3)	mg/L	-	830	880
Alkalinity (pp as CaCO3)	mg/L	-	21	15
Ionic Balance	N/A	-	1.0	2.7
Water Nutrients				
Ammonia-N	mg/L	-	0.60	0.52
TKN	mg/L	-	1.3	1.2
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	55	42
DOC	mg/L	-	13	14
Metals				
Aluminum	mg/L	0.1	0.015	0.0093
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0012	0.00075
Barium	mg/L	1	0.031	0.034
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.82	0.79
Cadmium	mg/L	0.005	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00056	0.00043
Copper	mg/L	1	0.0026	<0.00020
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.064	0.067
Manganese	mg/L	0.05	0.022	0.032
Mercury	mg/L	0.001	0.000017	<0.0000020
Molybdenum	mg/L	-	0.010	0.0088
Nickel	mg/L	-	0.0019	0.00085
Phosphorus	mg/L	-	0.13	0.11
Selenium	mg/L	0.05	0.00023	<0.00020
Silicon	mg/L	-	3.4	3.5
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.045	0.046
Sulphur	mg/L	-	1.0	0.72
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.00037	0.00026
Vanadium	mg/L	-	0.0028	0.0021
Zinc	mg/L	5	0.0033	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - May 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	15.830
Volume Purged (L)	50 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	3.162

Table 6: Groundwater Quality Assurance and Quality Control

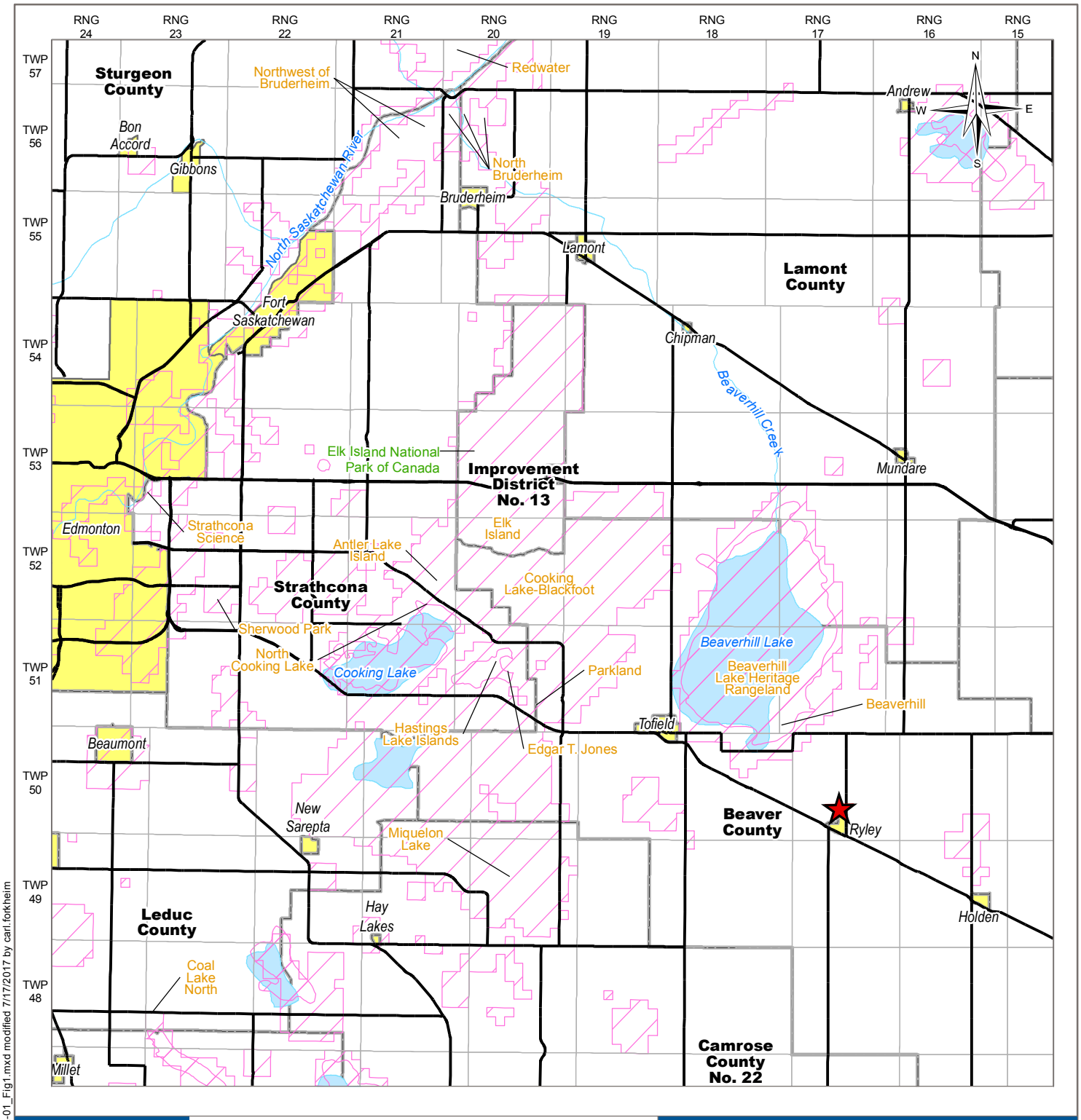
Parameter	Unit	RDL	17DUP1	MW-22B	RPD (%)	17DUP2	MW-26B	RPD (%)	17DUP3	MW-28B	RPD (%)	17DUP4	MW-33B	RPD (%)	17DUP5	MW-34A	RPD (%)	17FB01	17TB
			1-Jun-2017			1-Jun-2017			1-Jun-2017			6-Jun-2017			6-Jun-2017			6-Jun-2017	6-Jun-2017
Routine																			
pH	pH Units		8.1	8.23	2%	8.11	8.19	1%	8.08	8.08	0%	8.03	7.99	0%	8.45	8.43	0%	-	-
Electrical Conductivity (EC)	µS/cm	1	8000	8000	0%	7500	7600	1%	12,000	12,000	0%	5600	5600	0%	2500	2500	0%	-	-
Total Dissolved Solids (TDS)	mg/L	10	5900	6000	2%	5900	5700	3%	10,000	9700	3%	4100	4100	0%	1600	1600	0%	-	-
Hardness as CaCO3	mg/L	0.5	490	490	0%	570	570	0%	960	960	0%	500	490	2%	40	40	0%	-	-
Alkalinity (total as CaCO3)	mg/L	0.5	1000	1000	0%	860	860	0%	880	870	1%	1000	1000	0%	1100	1000	10%	-	-
Alkalinity (P)	mg/L	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	13	12	8%	-	-
Bicarbonate	mg/L	0.5	1200	1200	0%	1000	1000	0%	1100	1100	0%	1200	1200	0%	1300	1200	8%	-	-
Carbonate	mg/L	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	15	15	0%	-	-
Hydroxide	mg/L	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	-
Calcium (Filtered)	mg/L	0.3	110	110	0%	120	120	0%	220	220	0%	130	130	0%	12	12	0%	<0.3	-
Magnesium (Filtered)	mg/L	0.2	53	54	2%	67	66	2%	100	100	0%	43	42	2%	2.2	2.2	0%	<0.2	-
Potassium (Filtered)	mg/L	0.3	9.4	9.8	4%	7.6	7.5	1%	12	12	0%	5.7	6.1	7%	2.7	2.6	4%	<0.3	-
Sodium (Filtered)	mg/L	0.5	1900	2000	5%	1800	1800	0%	3100	3200	3%	1300	1200	8%	610	600	2%	<0.5	-
Chloride (Filtered)	mg/L	1	1.7	1.9	-	4.6	4.5	-	31	30	3%	21	21	0%	26	25	4%	-	-
Sulphate (Filtered)	mg/L	5	3200	3300	3%	3500	3200	9%	6400	5700	12%	2100	2100	0%	320	310	3%	-	-
Anions Total	meq/L		87	88	1%	89	84	6%	150	140	7%	64	64	0%	28	28	0%	-	-
Cations Total	meq/L		94	96	2%	89	89	0%	160	160	0%	65	63	3%	27	27	0%	-	-
Ionic Balance	N/A		3.7	4	8%	0.022	3.1	**197%**	1.4	7.3	**136%**	0.67	0.82	20%	1.7	2.4	**34%**	-	-
Nutrients																			
Ammonia as N	mg/L	0.015	0.039	0.04	3%	0.55	0.66	18%	1.6	1.6	0%	0.58	0.6	3%	0.95	0.94	1%	-	-
Total Kjeldahl Nitrogen (TKN)	mg/L	0.05	0.36	0.32	12%	0.91	0.99	8%	2.2	2.1	5%	2.7	2.7	0%	1.8	1.8	0%	-	-
Nitrate (as NO3) (Filtered)	mg/L	0.044	0.3	0.38	24%	0.37	0.42	13%	<0.22	<0.22	-	1.1	0.68	-	<0.044	<0.044	-	-	-
Nitrate (as NO3-N) (Filtered)	mg/L	0.01	0.067	0.086	25%	0.084	0.095	12%	<0.05	<0.05	-	0.24	0.15	-	<0.01	<0.01	-	-	-
Nitrate and Nitrite (as N)	mg/L	0.05	0.067	0.086	-	0.084	0.095	12%	0.19	0.12	-	0.33	0.21	-	<0.01	<0.01	-	-	-
Demand Parameters																			
Chemical Oxygen Demand (COD)	mg/L	5	30	20	-	25	28	11%	41	35	16%	140	150	7%	190	190	0%	-	-
Dissolved Organic Carbon (DOC) (Filtered)	mg/L	0.5	6.6	6.6	0%	11	12	9%	17	17	0%	51	49	4%	60	60	0%	<0.5	-
Hydrocarbons																			
Benzene	mg/L	0.0004	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-	-	<0.00040
Toluene	mg/L	0.0004	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-	-	<0.00040
Ethylbenzene	mg/L	0.0004	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-	-	<0.00040
Xylenes Total	mg/L	0.0008	<0.00080	<0.00080	-	<0.00080	<0.00080	-	<0.00080	<0.00080	-	<0.00080	<0.00080	-	<0.00080	<0.00080	-	-	<0.00080
F1 (C6-C10) less BTEX	mg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	-	<0.10
F2 (C10-C16 Hydrocarbons)	mg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	-	<0.10
Laboratory Work Order Number			B743380	B743380		B743380	B743380		B743380	B743380		B744752	B744752		B744752	B744752		B744752	B744752
Laboratory Identification Number			RE9062	RE9045		RE9063	RE9049		RE9064	RE9053		RF6456	RF6394		RF6457	RF6395		RF6455	RF6454

Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" 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.
Blank - Not analyzed
Shaded - RPD value greater than 20%

Parameter	Unit	RDL	17DUP1	MW-22B	RPD (%)	17DUP2	MW-26B	RPD (%)	17DUP3	MW-28B	RPD (%)	17DUP4	MW-33B	RPD (%)	17DUP5	MW-34A	RPD (%)	17FB01	17TB
			1-Jun-2017			1-Jun-2017			1-Jun-2017			6-Jun-2017			6-Jun-2017			6-Jun-2017	6-Jun-2017
Metals																			
Aluminum (Filtered)	mg/L	0.003	<0.003	0.0037	-	0.0073	0.0072	-	0.0035	0.0039	-	<0.003	0.0049	-	0.0041	0.0049	18%	0.0036	-
Antimony (Filtered)	mg/L	0.0006	<0.0006	<0.0006	-	<0.0006	<0.0006	-	<0.0006	<0.0006	-	<0.0006	<0.0006	-	<0.0006	<0.0006	-	<0.0006	-
Arsenic (Filtered)	mg/L	0.0002	0.00028	0.00027	-	0.00077	0.00077	-	0.00038	0.0004	-	0.0015	0.0014	7%	0.0022	0.0028	-	<0.0002	-
Barium (Filtered)	mg/L	0.01	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	0.033	0.039	17%	<0.01	-
Beryllium (Filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	-
Boron - soluble (Filtered)	mg/L	0.02	0.25	0.25	0%	0.28	0.29	4%	0.46	0.44	4%	0.25	0.25	0%	0.84	0.84	0%	<0.02	-
Cadmium (Filtered)	mg/L	0.00002	<0.00002	<0.00002	-	<0.00002	<0.00002	-	0.000027	0.000022	-	0.000045	0.000044	-	<0.00002	<0.00002	-	<0.00002	-
Chromium (Filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	-
Cobalt (Filtered)	mg/L	0.0003	<0.0003	<0.0003	-	0.00073	0.00081	-	0.0015	0.0015	0%	0.0024	0.0024	0%	0.00054	0.00054	0%	<0.0003	-
Copper (Filtered)	mg/L	0.0002	0.00057	0.00037	-	0.00055	0.00039	-	0.0006	0.00033	-	0.0024	0.0028	15%	<0.0002	<0.0002	-	<0.0002	-
Iron (Filtered)	mg/L	0.06	<0.6	<0.6	-	<0.6	<0.6	-	<0.6	<0.6	-	<0.6	<0.6	-	0.24	0.31	25%	<0.06	-
Lead (Filtered)	mg/L	0.0002	<0.0002	<0.0002	-	<0.0002	<0.0002	-	<0.0002	<0.0002	-	<0.0002	<0.0002	-	<0.0002	<0.0002	-	<0.0002	-
Lithium (Filtered)	mg/L	0.02	0.7	0.75	7%	0.49	0.48	2%	0.69	0.69	0%	0.36	0.37	3%	0.13	0.13	0%	<0.02	-
Manganese (Filtered)	mg/L	0.004	<0.04	<0.04	-	0.22	0.22	0%	0.25	0.25	0%	0.25	0.25	0%	0.12	0.13	8%	<0.004	-
Mercury (Filtered)	mg/L	0.000002	<0.000002	<0.000002	-	<0.000002	<0.000002	-	<0.000002	<0.000002	-	0.0000076	0.0000076	0%	<0.000002	<0.000002	-	<0.000002	<0.000002
Molybdenum (Filtered)	mg/L	0.0002	0.00081	0.00082	1%	0.00085	0.00087	-	0.00068	0.00078	-	0.00064	0.0008	-	0.011	0.012	9%	<0.0002	-
Nickel (Filtered)	mg/L	0.0005	0.0014	0.0013	7%	0.0013	0.0013	-	0.0035	0.0038	8%	0.011	0.011	0%	0.0041	0.0039	5%	<0.0005	-
Phosphorus (Filtered)	mg/L	0.1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-	<0.1	<0.1	-	<0.1	-
Selenium (Filtered)	mg/L	0.0002	0.00032	0.00028	13%	<0.0002	<0.0002	-	<0.0002	<0.0002	-	0.00043	0.00043	0%	<0.0002	<0.0002	-	<0.0002	-
Silicon (Filtered)	mg/L	0.1	4.8	4.7	2%	4.3	4.5	5%	4.8	4.7	2%	4.8	4.6	4%	4	4.1	2%	<0.1	-
Silver (Filtered)	mg/L	0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	-
Strontium (Filtered)	mg/L	0.02	2.4	2.5	4%	2.5	2.5	0%	5.4	5.4	0%	2.4	2.3	4%	0.24	0.24	0%	<0.02	-
Sulphur (Filtered)	mg/L	0.2	1200	1200	0%	1200	1200	0%	2200	2200	0%	710	690	3%	100	100	0%	<0.2	-
Thallium (Filtered)	mg/L	0.0002	<0.0002	<0.0002	-	<0.0002	<0.0002	-	<0.0002	<0.0002	-	<0.0002	<0.0002	-	<0.0002	<0.0002	-	<0.0002	-
Tin (Filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	-
Titanium (Filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	-
Uranium (Filtered)	mg/L	0.0001	0.0077	0.0079	3%	0.00085	0.00082	4%	0.00052	0.00054	4%	0.00023	0.00026	-	0.0047	0.005	6%	<0.0001	-
Vanadium (Filtered)	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	0.001	0.0011	10%	<0.001	-
Zinc (Filtered)	mg/L	0.003	<0.003	<0.003	-	<0.003	<0.003	-	<0.003	<0.003	-	<0.003	<0.003	-	<0.003	<0.003	-	<0.003	-
Laboratory Work Order Number				B644197		B644197			B644197	B644197			B644197		B644197			B644197	B644197
Laboratory Identification Number				OT5956		OT6001			OT5999	OT6002			OT5950		OT6003			OT5981	OT6180

Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" 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.
Blank - Not analyzed
Shaded - RPD value greater than 20%

FIGURES



LEGEND

- Site Location
- Primary/Secondary Highway
- Environmentally Significant Area
- Protected Area
- National Parks
- Indian Reserve
- Urban Area
- Municipal Area
- Watercourse
- Waterbody

NOTES

Base data source: ESRI, CanVec (50,000), AltaLIS, ESRD & Government of Alberta (Tourism, Parks and Recreation)

STATUS
ISSUED FOR USE

2017 GROUNDWATER MONITORING PROGRAM, RYLEY, AB

Regional Environmental Context

PROJECTION	DATUM
UTM Zone 12	NAD83

Scale: 1:500,000
10 5 0 10
Kilometers

FILE NO.				
SWOP03652-01_Fig1.mxd				
PROJECT NO.	**DWN**	**CKD**	**APVD**	**REV**
SWM.SWOP03652-01	RG/CF	BS	AS	0
OFFICE	**DATE**			
Tt EBA-CAL	July 17, 2017			

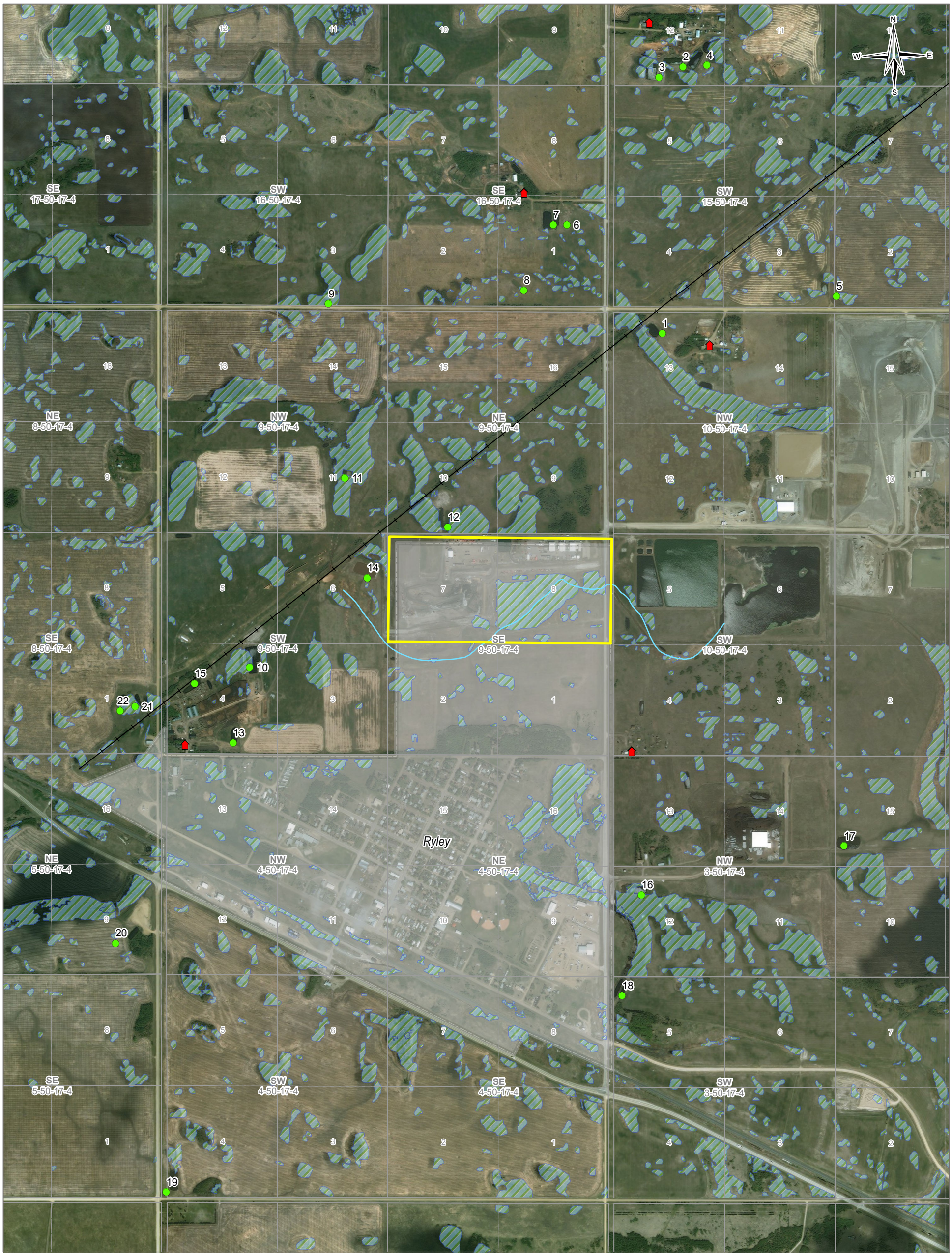
CleanHarbors

PREPARED BY:
TETRA TECH

Figure 1

\\tt.local\ebaProjects\CGY\78070\SWOP03652\GIS\Maps\SWOP03652-01_Fig1.mxd modified 7/17/2017 by carl.forkheim

\\tt.local\eba\Projects\CGY\78070\SWOP03652\GIS\Maps\SWOP03652-01_Fig2_11x17.mxd modified 7/17/2017 by carl.forkheim



LEGEND

- Rural Residence
- Water Sample Location
- Site Outline
- Historical Railway Bed (Approximate Centreline)
- Bible Creek (Approximate Centreline)
- Potential Wetland
- Town Boundary

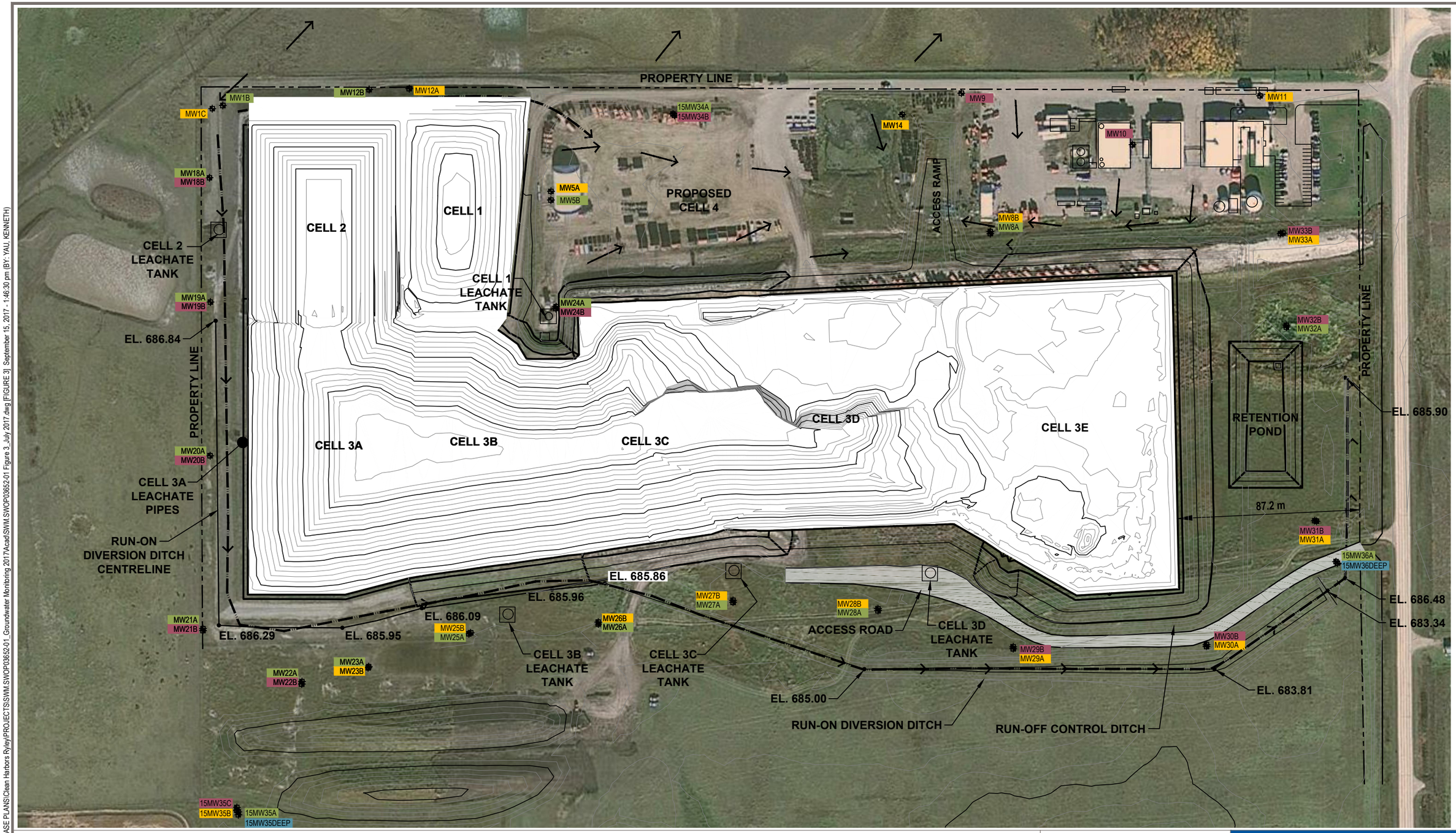
NOTES
Base data source: ESRI, CanVec (50,000) & ESRD

STATUS
ISSUED FOR USE

2017 GROUNDWATER MONITORING PROGRAM, RYLEY, AB

Local Environmental Context

PROJECTION: UTM Zone 12			DATUM: NAD83	CLIENT: CleanHarbors	
Scale: 1:13,500					
200 100 0 200 Metres					
FILE NO.: SWOP03652-01_Fig2_11x17.mxd				TETRA TECH	
OFFICE: Tt-CAL	DWN: RG/CF	CKD: BS	APVD: AS	REV: 0	Figure 2
DATE: July 17, 2017	PROJECT NO.: SWM.SWOP03652-01				



LEGEND:

- MONITORING WELL LOCATION
- SURFICIAL MATERIALS
- UPPER SANDSTONE
- CLAY SHALE
- LOWER BEDROCK
- SURFACE WATER DRAINAGE DITCH
- TOPOGRAPHIC CONTOURS
- SURFACE WATER DRAINAGE DIRECTION

0 100 m

Scale: 1: 2 500

CLIENT

Clean Harbors

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2017 GROUNDWATER MONITORING PROGRAM RYLEY, AB

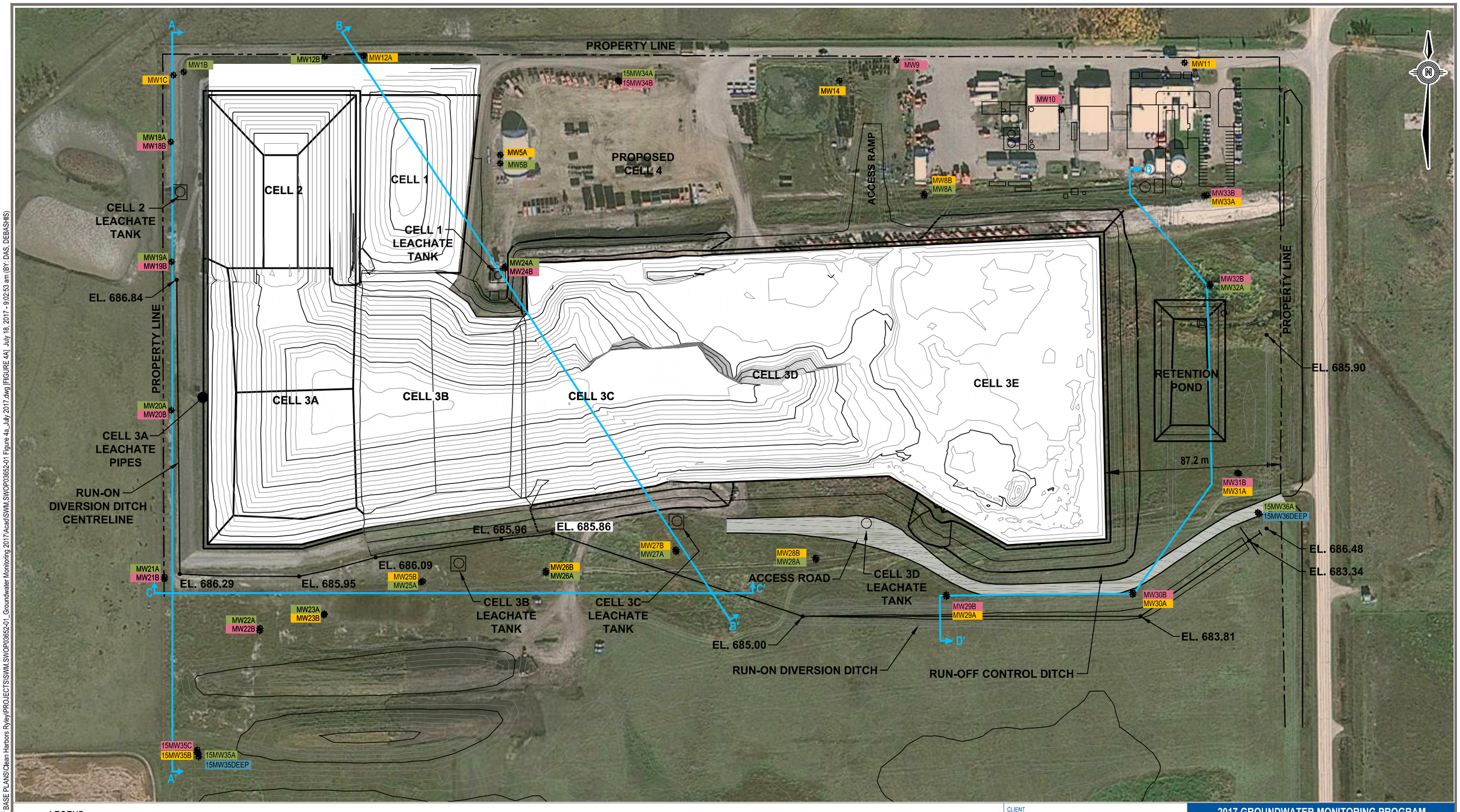
Monitoring Well Location Plan and Surface Water Drainage

PROJECT NO.	DWN	CKD	REV
SWM.SWOP03652-01	MM/DBD	CF	0

OFFICE: EDM

DATE: July 2017

Figure 3



LEGEND:

- MONITORING WELL LOCATION
- SURFICIAL MATERIALS
- UPPER SANDSTONE
- CLAY SHALE
- LOWER BEDROCK
- CROSS-SECTION LOCATION

0 100 m

Scale: 1: 2 500

CLIENT

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2017 GROUNDWATER MONITORING PROGRAM RYLEY, AB

Cross-Section Location

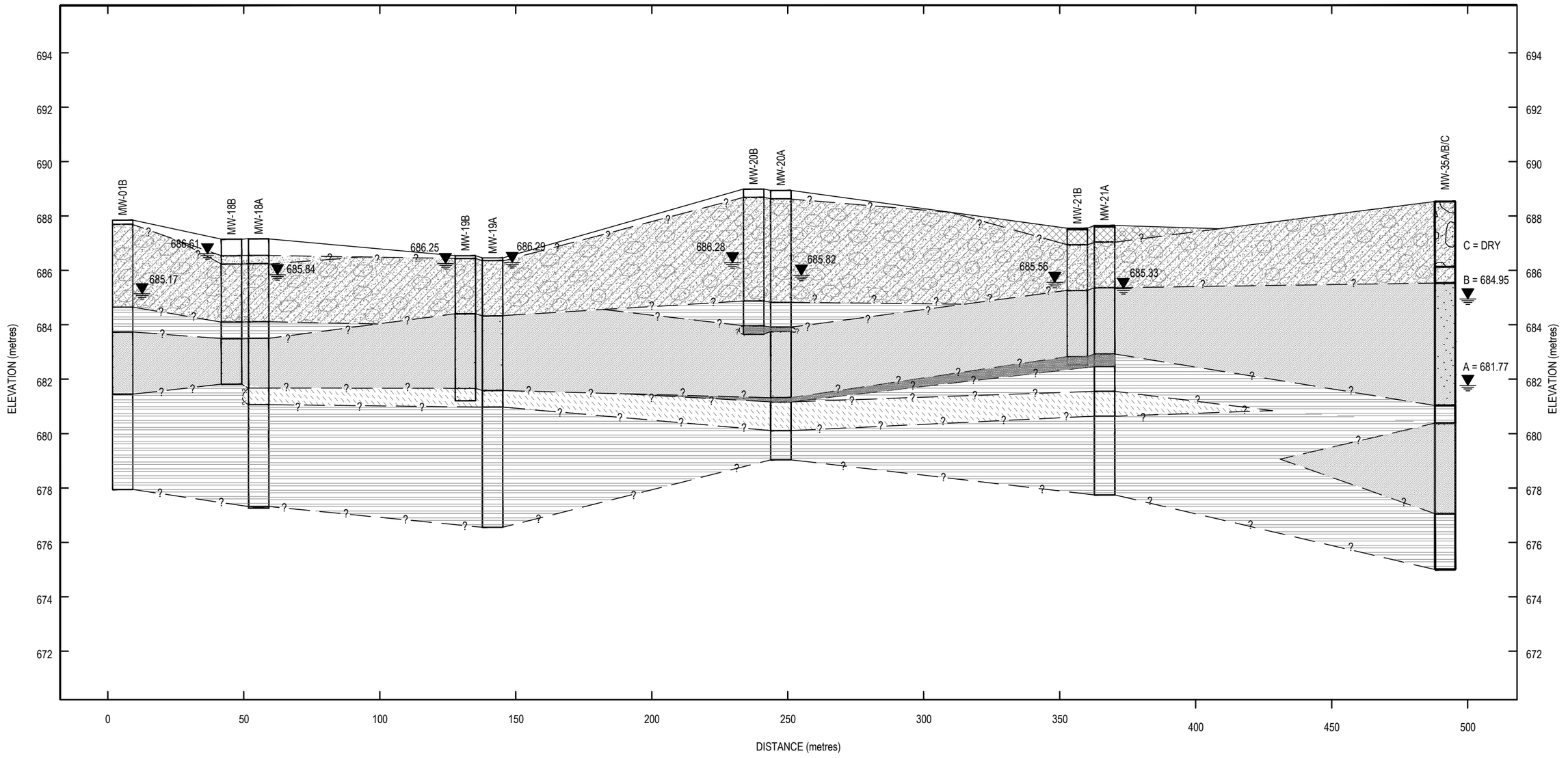
PROJECT NO.	DWN	CKD	REV
SWM.SWOP03652-01	MM/DBD	CF	0
OFFICE: EDM	DATE: July 2017		

Figure 4a

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Clean Harbors Ryley\PROJECTS\SWM.SWOP03652-01_Groundwater Monitoring 2017\Acad\SWM.SWOP03652-01 Figure 4a_July 2017.dwg [FIGURE 4A], July 18, 2017 - 9:02:53 am (BY: DAS, DEBASHIS)

A (NORTH)

A' (SOUTH)



SCALE AS SHOWN

10 X VERTICAL EXAGGERATION

LEGEND:

- TOPSOIL
- SAND
- SHALE
- SAND AND SHALE STONE
- CLAY
- GRAVEL
- SANDSTONE
- FILL
- SILT
- TILL
- SILTSTONE
- xxx.xx - GROUNDWATER ELEVATIONS IN METRES ABOVE SEA LEVEL (MASL)
- ? —— ? —— ? — - INFERRED

CLIENT

Clean Harbors

TETRA TECH

2017 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Cross-Section A-A'

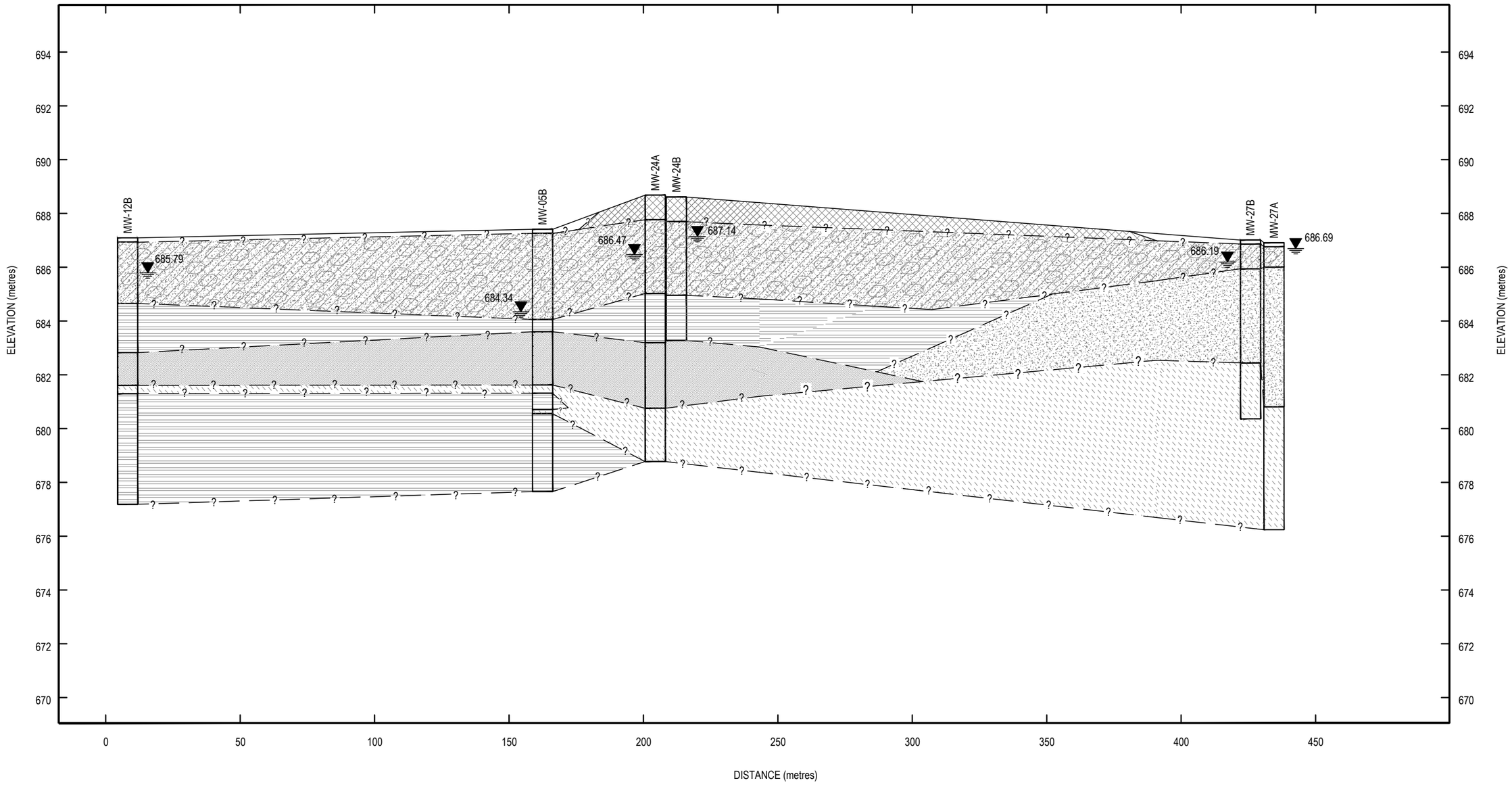
PROJECT NO.	DWN	CKD	REV
SWM.SWOP03652-01	MM/DBD	CF	0

OFFICE	DATE
EDM	August 2017

Figure 4b

B (NORTH-WEST)

B' (SOUTH-EAST)



SCALE AS SHOWN
10 X VERTICAL EXAGGERATION

LEGEND:

- TOPSOIL
- SAND
- SHALE
- SAND AND SHALE STONE
- CLAY
- GRAVEL
- SANDSTONE
- FILL
- SILT
- TILL
- SILTSTONE
- XXX.XX ▼ - GROUNDWATER ELEVATIONS IN METRES ABOVE SEA LEVEL (MASL)
- —?——?——?— - INFERRED

CLIENT

Clean Harbors

TETRA TECH

2017 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

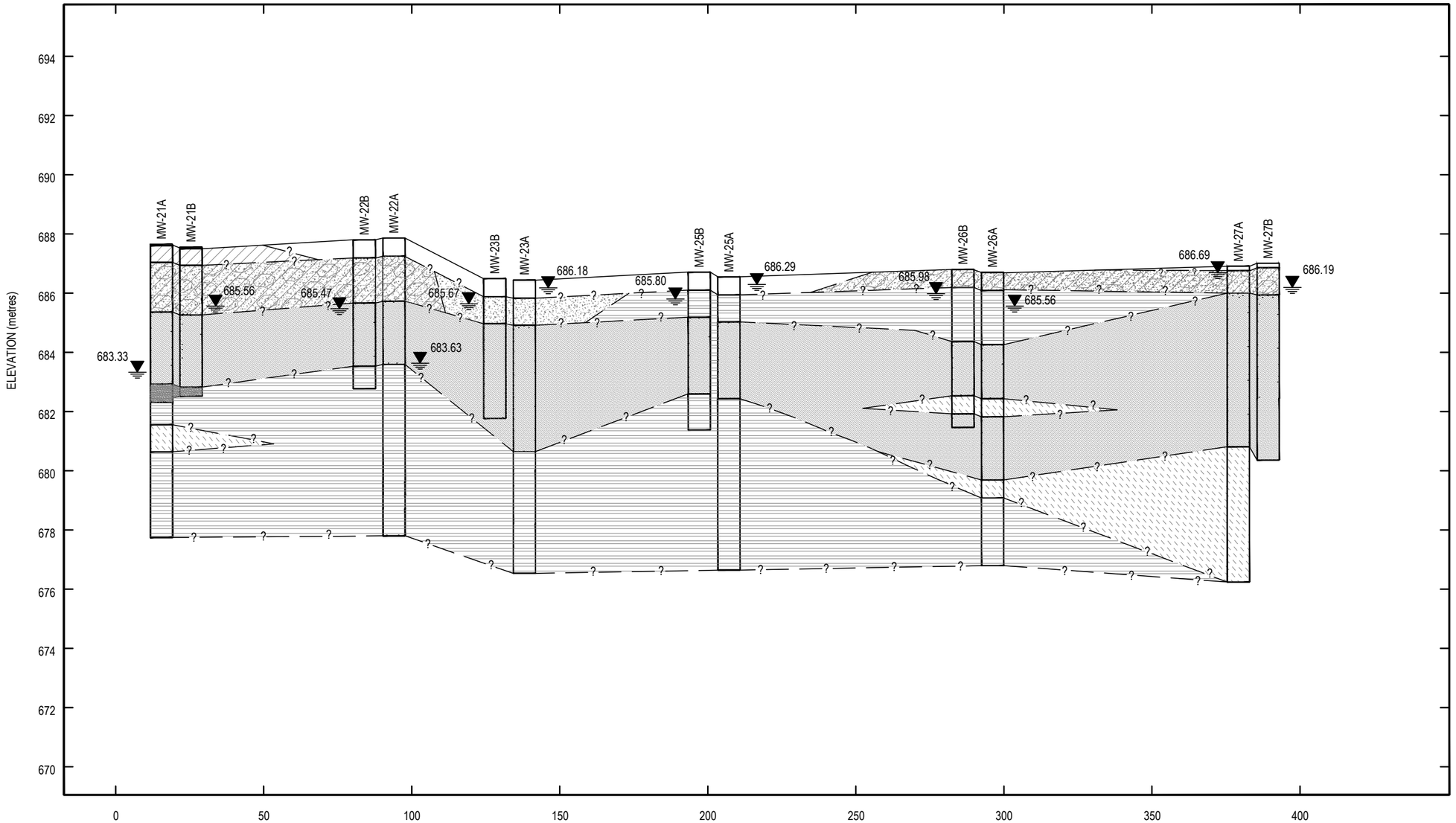
Cross-Section B-B'

PROJECT NO.	DWN	CKD	REV
SWM.SWOP03652-01	MM/DBD	CF	0
OFFICE: EDM	DATE: August 2017		

Figure 4c

C (WEST)

C' (EAST)



SCALE AS SHOWN
10 X VERTICAL EXAGGERATION

LEGEND:

- TOPSOIL
- SAND
- SHALE
- SAND AND SHALE STONE
- CLAY
- GRAVEL
- SANDSTONE
- FILL
- SILT
- TILL
- SILTSTONE
- xxx.xx - GROUNDWATER ELEVATIONS IN METRES ABOVE SEA LEVEL (MASL)
- ? — ? — ? — - INFERRED

CLIENT

Clean Harbors

TETRA TECH

2017 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

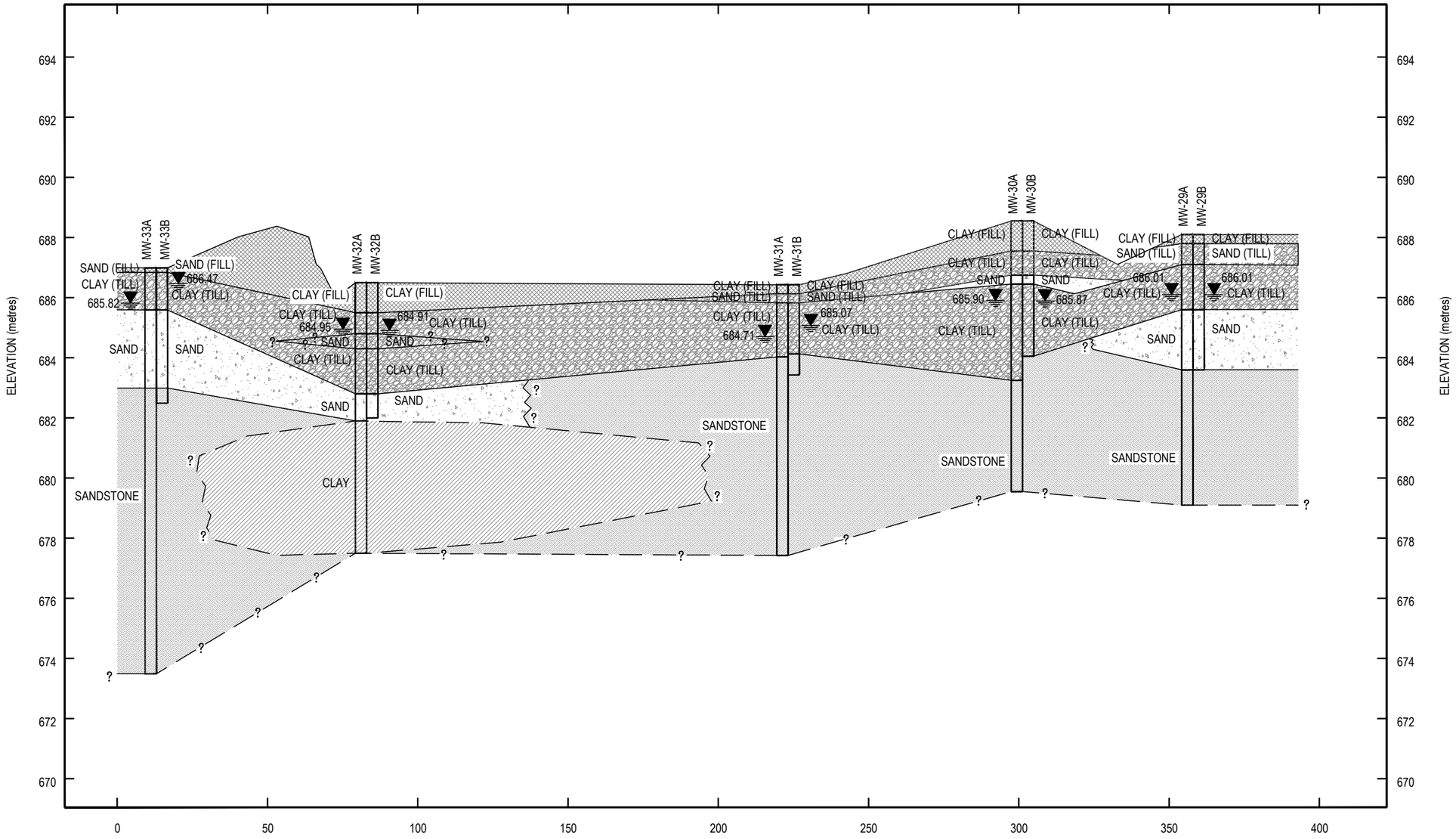
Cross-Section C-C'

PROJECT NO.	DWN	CKD	REV
SWM.SWOP03652-01	MM/DBD	CF	0

OFFICE: EDM
DATE: August 2017

Figure 4d

D (NORTH) D' (SOUTH)



SCALE AS SHOWN
10 X VERTICAL EXAGGERATION

LEGEND:

- FILL
- CLAY
- TILL
- SAND
- SANDSTONE
- xxx.xx - GROUNDWATER ELEVATIONS IN METRES ABOVE SEA LEVEL (MASL)
- —?——?——?— - INFERRED

CLIENT: CleanHarbors

TETRA TECH

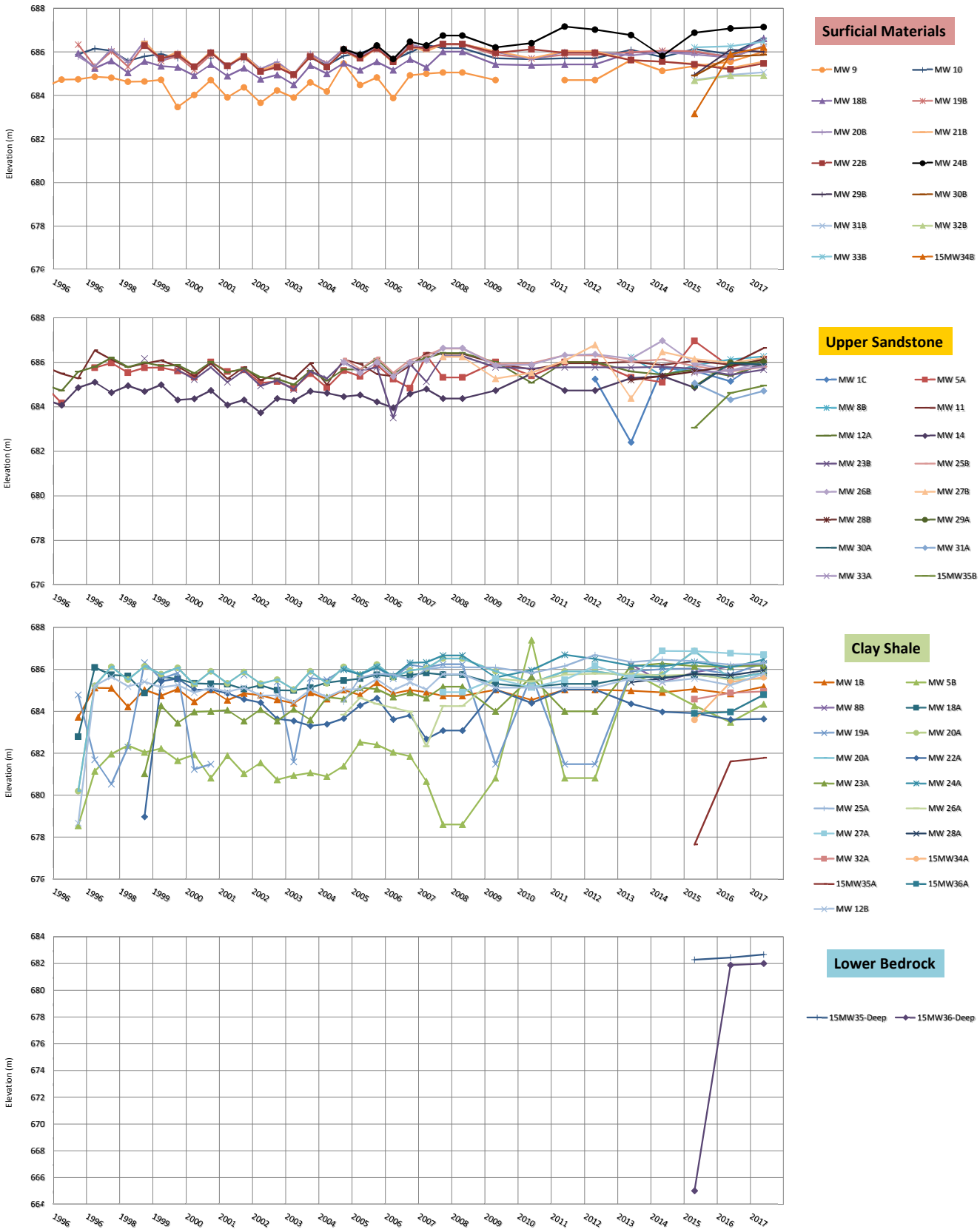
2017 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

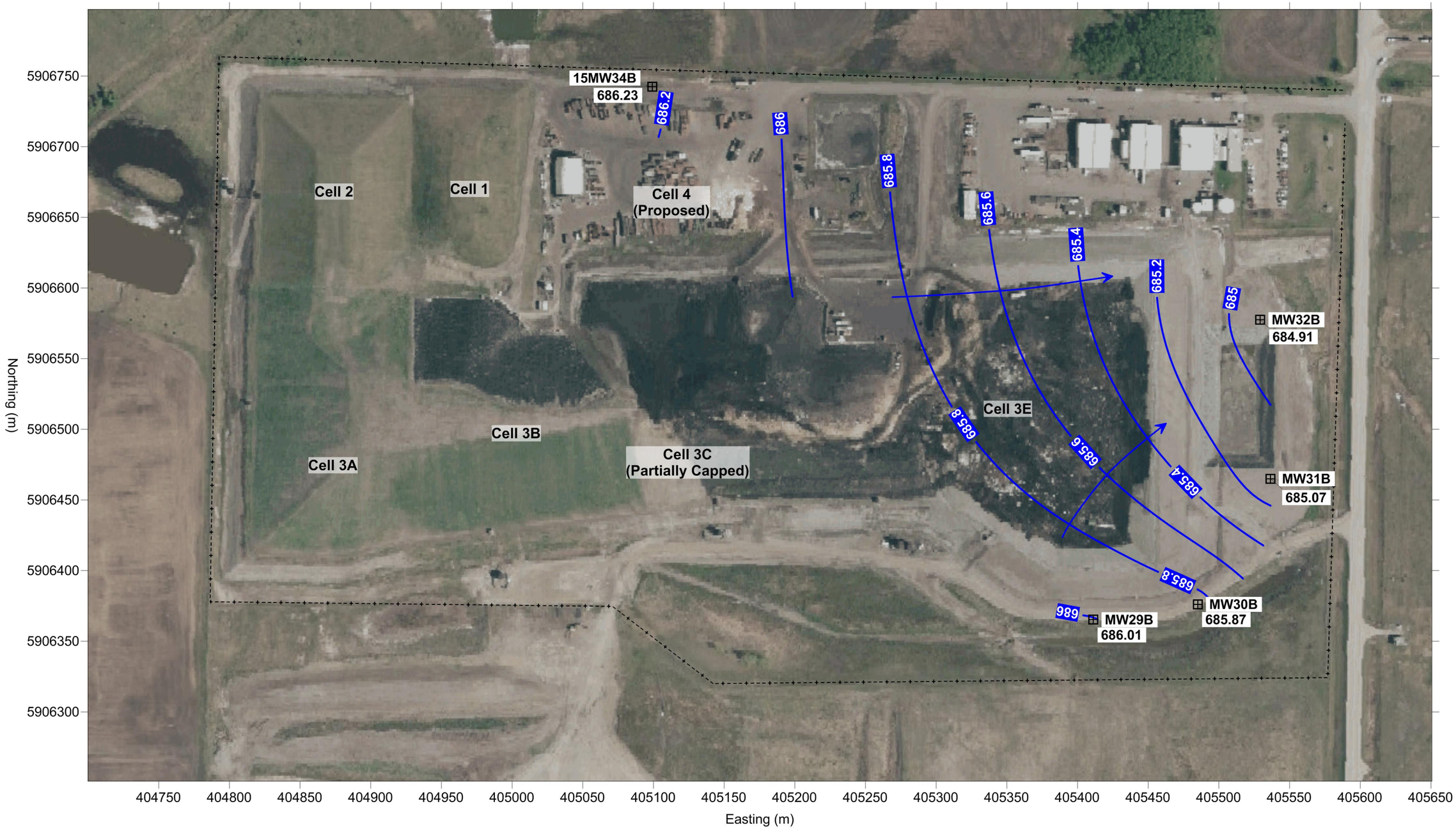
Cross-Section D-D'

PROJECT NO.	DWN	CKD	REV
SWM.SWOP03652-01	MM/DBD	CF	0
OFFICE: EDM	DATE: August 2017		

Figure 4e

Figure 5 - Groundwater Elevation Hydrographs





filepath here:W:\eba\Projects\CGY\178070\SWOP03652\Data\Figre 6A - Surficial Materials.srf

LEGEND

- ⊞ - MONITORING WELL LOCATION
- 686.55 m - GROUNDWATER ELEVATION (MASL = Metres above sea level)
- GROUNDWATER ELEVATION CONTOUR
- INTERPOLATED GROUNDWATER FLOW DIRECTION
- SITE BOUNDARY

UTM ZONE 12
NAD 83 DATUM

CLIENT

CleanHarbors®

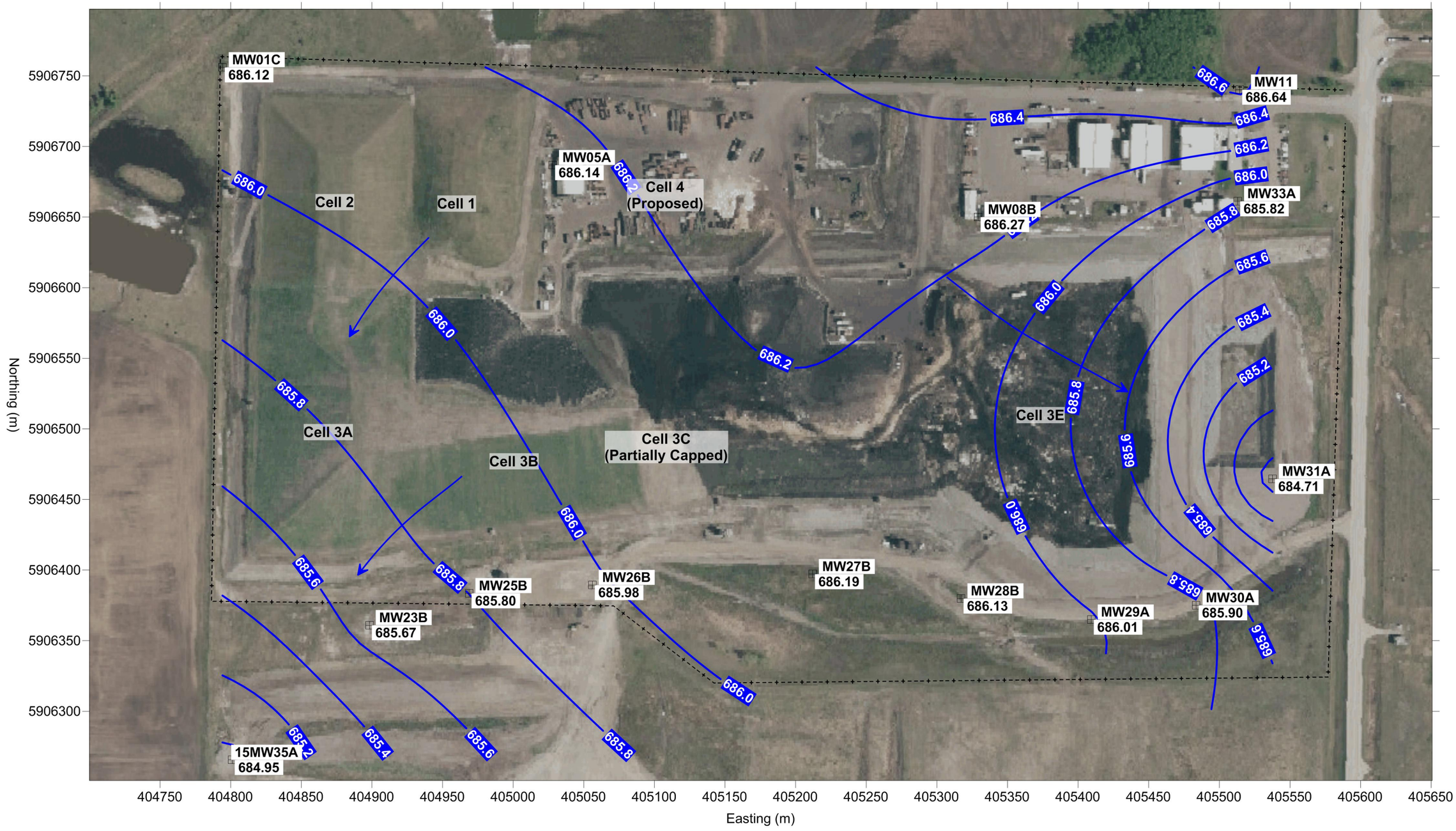
TETRA TECH

2017 GROUNDWATER MONITORING PROGRAM RYLEY, AB

GROUNDWATER ELEVATION CONTOURS SURFICIAL MATERIALS (MAY 2017)

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03652-01	CF	BS	AS	000
OFFICE	DATE		STATUS	
EBA-CALGARY	September 2017		Issued for Use	

Figure 6a



LEGEND

- ⊞ - MONITORING WELL LOCATION
- 686.55 m - GROUNDWATER ELEVATION (MASL = Metres above sea level)
- — - GROUNDWATER ELEVATION CONTOUR
- → - INTERPOLATED GROUNDWATER FLOW DIRECTION
- - SITE BOUNDARY

UTM ZONE 12
NAD 83 DATUM

CLIENT

CleanHarbors®

TETRA TECH

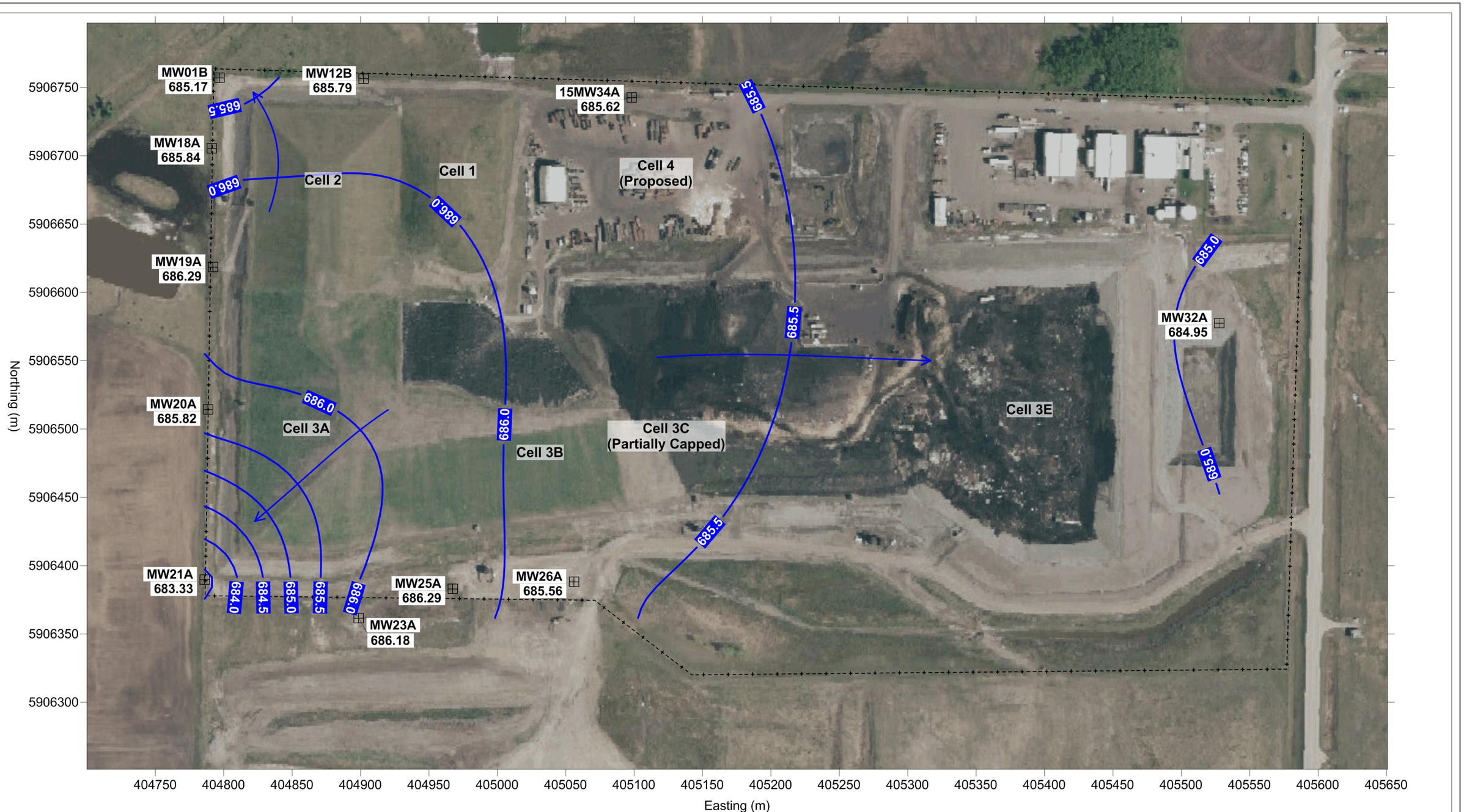
2017 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

GROUNDWATER ELEVATION CONTOURS
UPPER SANDSTONE (MAY 2017)

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03652-01	CF	BS	AS	000
OFFICE	DATE		STATUS	
EBA-CALGARY	September 2017		Issued for Use	

Figure 6b

filepath here:W:\eba\Projects\CGY\78070\SWOP03652\Data\Figre 5B - Upper Bedrock.srf



filepath here:W:\eba\Projects\CGY\78070\SWOP03652\Data\Figure 6C - Middle Bedrock.srf

LEGEND

- ⊞ - MONITORING WELL LOCATION
- 686.55 m - GROUNDWATER ELEVATION (MASL = Metres above sea level)
- — - GROUNDWATER ELEVATION CONTOUR
- → - INTERPOLATED GROUNDWATER FLOW DIRECTION
- - SITE BOUNDARY

UTM ZONE 12
NAD 83 DATUM

CLIENT

CleanHarbors®

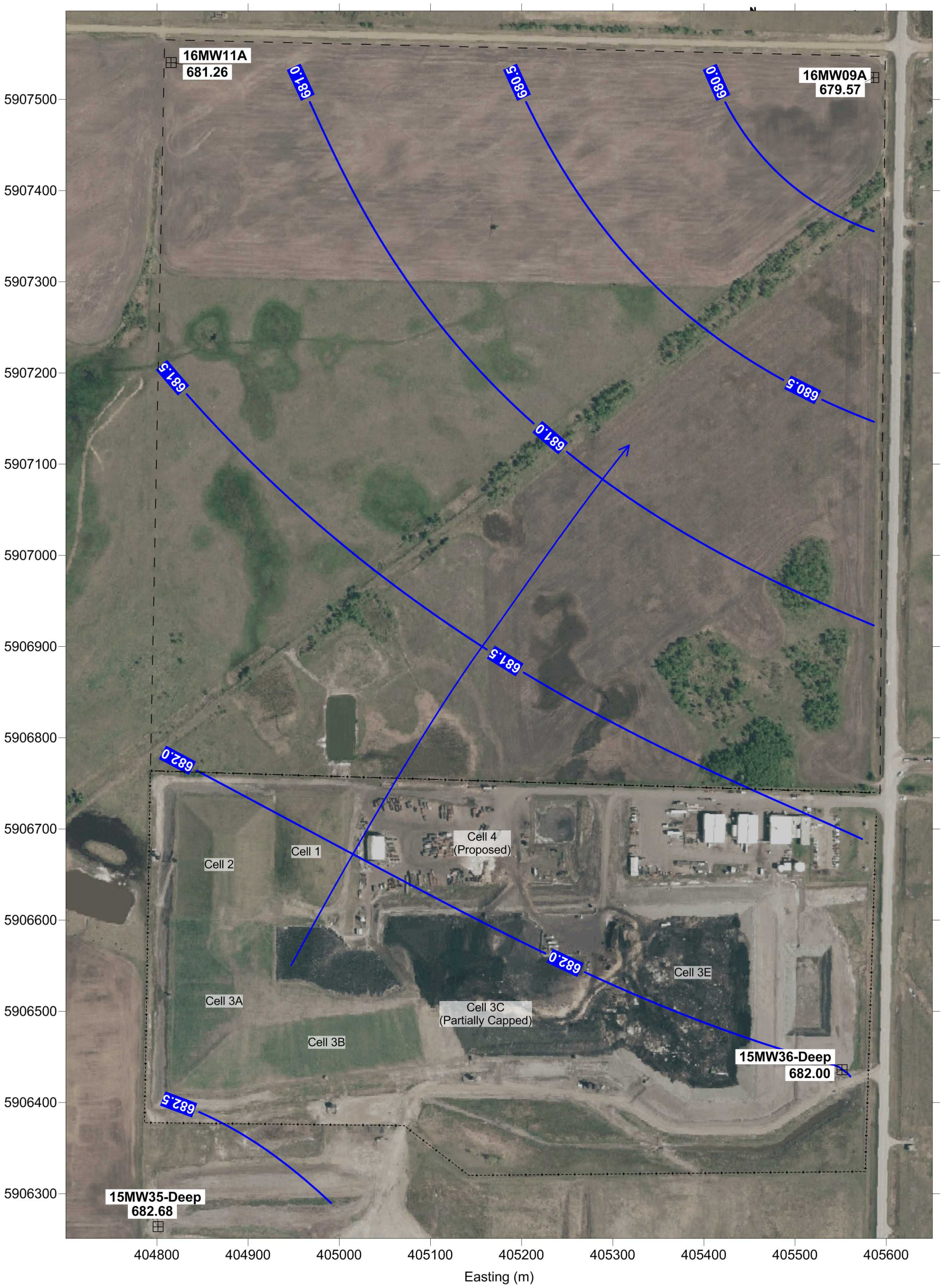
TETRA TECH

2017 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

GROUNDWATER ELEVATION CONTOURS
CLAY SHALE (MAY 2017)

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03652-01	CF	BS	AS	000
OFFICE	DATE		STATUS	
EBA-CALGARY	September 2017		Issued for Use	

Figure 6c



filepath here: \eba\Projects\CGY\78070\SWOP03652\Data/Figure6D - Lowerbedrock_Portrait.srf

LEGEND

- ⊞ - MONITORING WELL LOCATION
- 686.55 m - GROUNDWATER ELEVATION (MASL = Metres above sea level)
- — - GROUNDWATER ELEVATION CONTOUR
- → - INTERPOLATED GROUNDWATER FLOW DIRECTION
- – + – – - SITE BOUNDARY
- — — – - APPROXIMATE EXPANSION AREA

Note: Data from wells 16MW11A and 16MW09A from expansion used for contouring purposes.

Approximate Horizontal Gradient

→ 0.00321 → 0.0119

STATUS
Issued for Use

2017 GROUNDWATER MONITORING PROGRAM, RYLEY, ALBERTA

GROUNDWATER ELEVATION CONTOURS LOWER BEDROCK (MAY 2017)

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

0 40 80 120 160
Metres

TETRA TECH

FILE NO.
Figure6D - LowerBedrock.srf

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03652-01	CF	BS	AS	0

OFFICE	DATE
Tt-CAL	July 2017

Figure 6d

APPENDIX A

REGULATORY APPROVAL – ALBERTA ENVIRONMENT

Alberta Environment and Parks

Operations
Regulatory Approvals Centre
5 Floor, South Petroleum Plaza
9915 – 108 Street
Edmonton, Alberta T5K 2G8
Telephone: (780) 427-6311
Fax: (780) 422-0154
www.aep.alberta.ca

April 19, 2017

Michael Parker
Vice President, Canadian Environmental Compliance
Clean Harbors Canada, Inc.
4090 Telfer Road RR#1
Corunna ON NON 1G0

Dear Mr. Parker:

Re: Ryley Hazardous Waste Storage Facility and Landfill
Application No. 014-10348

Your application for a renewal of an existing approval under the *Environmental Protection and Enhancement Act* (EPEA) has been reviewed and enclosed is Approval No. 10348-03-00.

It is your responsibility to obtain any approvals, permits or licences that are required from other agencies.

The Act may provide the approval holder a right of appeal against any term or condition contained in the approval to the Alberta Environmental Appeals Board. You should note that there are strict time lines for filing an appeal dependent on the type of appeal. If you choose to appeal, please contact the office of the Registrar of Appeals, Environmental Appeals Board of Alberta, 3rd Floor, 10011 - 109 Street, Edmonton, Alberta, T5J 3S8, telephone (780) 427-6207.

If you have any questions, please contact me at (780) 415-2201 in Edmonton.

Yours truly,

A Vawter

Annette Vawter
Application Coordinator

Enclosure

cc: Weiguo Wu, Red Deer/North Saskatchewan Region - Edmonton
cc: Tetra Tech EBA Inc.
Attention: J. Paul Ruffell

Alberta Environment and Parks

APPROVAL

PROVINCE OF ALBERTA

ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT
R.S.A. 2000, c.E-12, as amended.

APPROVAL NO. 10348-03-00

APPLICATION NO. 014-10348

EFFECTIVE DATE: March 31, 2017

EXPIRY DATE: March 31, 2027

APPROVAL HOLDER: Clean Harbors Canada, Inc.

ACTIVITY: **CONSTRUCTION, OPERATION AND RECLAMATION OF THE**

Ryley Industrial Waste Management Facility, consisting of a Class I and Class II Industrial Landfill and a Hazardous Waste/Recyclable Storage and Processing Facility,

IS SUBJECT TO THE ATTACHED TERMS AND CONDITIONS.

Designated Director under the Act .....
Mohammad Habib, P. Eng.

Date Signed March 31, 2017

TERMS AND CONDITIONS ATTACHED TO APPROVAL

PART 1: DEFINITIONS

SECTION 1.1: DEFINITIONS

1.1.1 All definitions from the Act and the regulations apply except where expressly defined in this approval.

1.1.2 In all PARTS of this approval:

(a) "Act" means the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c.E-12, as amended;

(b) "action leakage rate" means the leakage rate that would occur through the primary liner, based on two holes per hectare, each with a diameter of 2 mm and that is calculated to be 790L/ha/day;

(c) "active landfill area" means the portion of the landfill that has received or is receiving waste for disposal, where final cover has not been placed, and includes areas that are being used for interim management of waste prior to disposition;

(d) "active landfill life" means the period of landfill life during which waste is received for disposal at the landfill, beginning with the initial receipt of waste and ending with the start of final landfill closure activities;

(e) "AER" means Alberta Energy Regulator;

(f) "affected lands" means lands which have received substances released from the facility;

(g) "air effluent stream" means any substance in a gaseous medium released by or from a facility;

(h) "APEGA" means the Association of Professional Engineers and Geoscientists of Alberta;

(i) "application" means the written submissions from the approval holder to the Director in respect of application No. 014-10348 and any subsequent applications where amendments are issued for this approval;

(j) "application No. 005-10348" means the written submissions from the approval holder to the Director in respect of renewal application No. 005-10348;

(k) "application No. 008-10348" means the written submissions from the approval holder to the Director in respect of amendment application No. 008-10348;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(l) "application No. 012-10348" means the written submissions from the approval holder to the Director in respect of amendment application No. 012-10348;

(m) "as-built plans" means survey plans, signed and stamped by a professional registered with APEGA, that document variances from design or construction plans that were either approved or authorized according to the terms and conditions of this approval;

(n) "BTEX" means benzene, toluene, ethylbenzene and xylene;

(o) "COD" means Chemical Oxygen Demand;

(p) "composite liner" means a liner that meets the specifications in 3.1.2(b) of this approval;

(q) "container" means any portable device in which a substance is kept, including but not limited to the following:

(i) drums, barrels and pails which have a capacity greater than 18 litres but less than 210 litres,

(ii) 320 litre overpack drums, and

(iii) 1000 litre tote tanks or sacks;

(r) "cover" means soil or other approved material that is used to cover compacted wastes in a landfill cell;

(s) "day", when referring to sampling, means any sampling period of 24 consecutive hours;

(t) "decommissioning" means the dismantling and decontamination of the facility undertaken subsequent to the termination or abandonment of any activity or any part of any activity regulated under the Act, excluding the landfill cells and those infrastructure components and facilities that are required for the landfill post-closure;

(u) "decontamination" means the treatment or removal of substances from the facility and affected lands;

(v) "Director" means an employee of the Government of Alberta designated as a Director under the Act;

(w) "dismantling" means the removal of buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling

TERMS AND CONDITIONS ATTACHED TO APPROVAL

facilities, railways, roadways, pipelines and any other installations that are being or have been used or held for or in connection with the facility;

(x) "DOC" means Dissolved Organic Carbon;

(y) "domestic wastewater" means wastewater that is the composite of liquid and water-carried wastes associated with the use of water for drinking, cooking, cleaning, washing, hygiene, sanitation or other domestic purposes, together with any infiltration and inflow wastewater, that is released into a wastewater collection system;

(z) "domestic wastewater system" means the parts of the facility that collect, store, or treat domestic wastewater from the facility;

(aa) "existing landfill cells" means Cell 1, Cell 2, Cell 3A, Cell 3B, and Cell 3C as described in application No. 005-10348;

(bb) "facility" means all buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling facilities, roadways, railways, pipelines and other installations, the Class I and Class II industrial landfill and the HWRSP Facility, and includes the land, located on the SE 1/4 of Section 9, Township 50, Range 17, West of the 4th Meridian, that is being or has been used or held for or in connection with the Ryley Industrial Waste Management Facility;

(cc) "facility developed area" means the areas of the facility used for the storage, treatment, processing, transport, or handling of raw material, intermediate product, by-product, finished product, process chemicals, or waste material, and includes the active landfill area;

(dd) "final cover" means a designed system, natural or man-made, that is placed on the surface of a landfill or landfill cell that has reached its maximum designated waste elevation to control transmission of moisture and landfill gas, and conforms to the end use plan;

(ee) "final landfill closure" means the period of time when waste is no longer placed in the defined portion of a landfill and activities are undertaken to complete the final cover system and decommission components and facilities that are no longer required, and includes the construction of any additional components or monitoring systems that are necessary for post-closure;

(ff) "free liquids" means the liquids as determined by the US EPA SW-846 Test Method 9095B: Paint Filter Liquids Test, as specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, US EPA Publication No. SW-846, as amended;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(gg) "fugitive emissions" means emissions of substances to the atmosphere other than ozone depleting substances, originating from a facility source other than a flue, vent, or stack but does not include sources which may occur due to breaks or ruptures in process equipment;

(hh) "GCL" means geosynthetic clay liner that is made of a thin layer of bentonite either bonded to a geomembrane or fixed between two sheets of geotextile;

(ii) "geomembrane" means a sheet of manufactured synthetic material designed to control migration of liquid and gas;

(jj) "grab sample" means an individual sample collected in less than 30 minutes and which is representative of the substance sampled;

(kk) "groundwater" means groundwater as defined in the *Water Act,* R.S.A. 2000, c.W-3, as amended;

(ll) "groundwater monitoring well" means a well drilled at a site to measure groundwater levels and collect groundwater samples for the purpose of physical, chemical, or biological analysis to determine the concentration of groundwater constituents;

(mm) "HDPE" means High Density Polyethylene;

(nn) "HWRSP Facility" means the Hazardous Waste/Recyclable Storage and Processing Facility as described in the application for storage, processing and transfer of hazardous wastes and hazardous recyclables and which includes the Maintenance Shop, and is an integral part of the facility;

(oo) "hydraulic conductivity" means the ease with which water can be transported through a material

(pp) "hydrocarbon" means a chemical compound that consists entirely of hydrogen and carbon;

(qq) "ISO/IEC 17025" means the international standard, developed and published by International Organization for Standardization (ISO), specifying management and technical requirements for laboratories;

(rr) "incompatible waste" means waste materials which could cause dangerous reactions from direct contact with one another;

(ss) "industrial wastewater" means the composite of liquid wastes and water-carried wastes, any portion of which results from any industrial process carried on at the HWRSP Facility;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(tt) "landfill" means the Class I and Class II industrial landfill as described in the application and which includes the waste stabilization area, and is an integral part of the facility;

(uu) "landfill cell" means a designed area of a landfill comprised of an excavation or earthen structure in which waste is enclosed;

(vv) "landfill cell closure" means the construction of a final cover for landfill cell including placement of previously conserved top soil and upper subsoil and re-vegetation as required for the intended future use of the landfill;

(ww) "landfill gas" means a mixture of gases generated by the microbial decomposition of and chemical reactions between wastes in a landfill;

(xx) "lateral expansion" means an expansion of landfill cell boundaries beyond the approved area;

(yy) "leachate" means a liquid that has been in contact with waste in the landfill cell and has undergone chemical or physical changes;

(zz) "leachate collection system" means a system that gathers leachate so that it may be removed from a landfill, and includes a permeable drainage material, a network of perforated pipes and sumps or manholes from where leachate can be removed;

(aaa) "leak detection liquid" means any liquid collected within the leak detection system;

(bbb) "leak detection system" means a system that gathers liquid between a primary liner and a secondary liner system, and consists of a permeable drainage material, a network of perforated pipes and sumps or manholes from where the liquid can be removed;

(ccc) "liner" means a continuous layer of synthetic material or compacted natural clay placed beneath and at the sides of a landfill cell that is compatible with the waste and restricts the migration of leachate, or landfill gas, or both;

(ddd) "local environmental authority" means the Department of Environment and Parks, in the Province of Alberta, or the agency that has the equivalent responsibilities for any jurisdiction outside the Province;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(eee) "major ions" means the following:

Calcium	Carbonate
Magnesium	Bicarbonate
Sodium	Chloride
Potassium	Sulfate

(fff) "maximum acceptable leachate head" means the maximum depth of leachate above the lowest part of the primary liner, not including the sumps or leachate collection pipe trenches, and is:

(i) 1.0 m in each of the existing landfill cells, and

(ii) 0.3 m in each of the new landfill cells

during active landfill life, landfill cell closure, final landfill closure, and post-closure;

(ggg) "maximum designated waste elevation" means the maximum elevation of waste in metres above sea level that can be disposed of at the landfill prior to construction of final cover, and is 714 metres;

(hhh) "metals" means the following:

Aluminum, dissolved	Chromium, dissolved (hexavalent)	Nickel, dissolved
Antimony, dissolved	Cobalt, dissolved	Selenium, dissolved
Arsenic, dissolved	Copper, dissolved	Silver, dissolved
Barium, dissolved	Lead, dissolved	Thallium, dissolved
Boron, dissolved	Manganese, dissolved	Tin, dissolved
Cadmium, dissolved	Mercury, total	Uranium, dissolved
Chromium, total	Molybdenum, dissolved	Zinc, dissolved

(iii) "monitoring system" means all equipment used for sampling, conditioning, analyzing or recording data in respect of any parameter listed or referred to in this approval, including equipment used for continuous monitoring;

(jjj) "month" means calendar month;

(kkk) "municipal solid waste" means solid waste resulting from or incidental to municipal, community, commercial, institutional and recreation activities, and includes garbage, rubbish, ashes, street cleanings, abandoned automobiles and all other solid wastes except hazardous waste, industrial solid waste, oilfield waste and biomedical wastes;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(lll) "new landfill cells" means Cell 3D as described in application No. 005-10348, Cell 3E as described in application No. 012-10348, and Cell 4 as described in the application;

(mmm) "new surface water detention pond" means the surface water detention pond as described in application No. 012-10348;

(nnn) "NORM" means Naturally Occurring Radioactive Materials;

(ooo) "NORM waste" means any waste material with concentrations of NORM above the limits specified in Tables 5.1, 5.2, or 5.3 of the *Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials (NORM)*, Health Canada, 2011, as amended;

(ppp) "nutrients" means the following:

Ammonia nitrogen	Nitrite nitrogen
Total Kjeldahl nitrogen	Total phosphorus
Nitrate nitrogen	Dissolved phosphorus

(qqq) "old surface water detention pond" means the surface water detention pond as described in application No. 005-10348;

(rrr) "Petroleum Hydrocarbons Fractions F1 and F2" means the specific hydrocarbon fraction measured by the analytical methods described in the *Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method,* published by the Canadian Council of Ministers of the Environment, 2001, as amended;

(sss) "points of compliance" means the location or locations of the groundwater monitoring wells where measurements of groundwater quality are taken to assess landfill and waste treatment performance;

(ttt) "post-closure" means the period of time after completion of the final landfill closure;

(uuu) "ppm" means concentration in parts per million;

(vvv) "primary liner" means the uppermost geomembrane liner;

(www) "QA/QC" means quality assurance and quality control;

(xxx) "quarter year" means a time period of three consecutive months designated as January, February and March; or April, May and June; or July, August and September; or October, November and December;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(yyy) "regulations" means the regulations enacted pursuant to the Act, as amended;

(zzz) "representative grab" means a sample consisting of equal volume portions of water collected from at least four sites between 0.20 to 0.30 metres below the water surface within a pond;

(aaaa) "runoff" means any rainwater or melt water that drains as surface flow from the facility developed areas, excluding leachate;

(bbbb) "runoff control system" means the parts of the facility that collect, store or treat runoff from the facility, and includes but is not limited to runoff collection ditches, surface water detention pond(s) and tank farm bermed area;

(cccc) "run-on" means any rainwater or melt water that drains as surface flow toward the active landfill area;

(dddd) "run-on control system" means the parts of the facility that divert run-on away from the active landfill area;

(eeee) "scrubber exhaust stack" means the exhaust stack through which the air effluent streams that are:

(i) collected from the exhaust vents of the Drum Processing Building or Staging Building or both, and

(ii) treated with the caustic scrubber and activated carbon filter

are released to the atmosphere as described in the application;

(ffff) "secondary liner" means the lowermost geomembrane liner;

(gggg) "soil" means mineral or organic earthen materials that can, have, or are being altered by weathering, biological processes, or human activity;

(hhhh) "SOP" means Standard Operating Procedures;

(iiii) "storm event" means a 1 in 25 year, 24 hour duration rainfall event at Ryley, Alberta;

(jjjj) "tank" means a stationary device, designed to contain an accumulation of a substance, which is constructed primarily of non-earthen materials that provide structural support including wood, concrete, steel, and plastic;

(kkkk) "TDGR" means the *Transportation of Dangerous Goods Regulations* (SOR/2001-286) made under the *Transportation of Dangerous Goods Act*, 1992 (Canada), as amended;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(llll) "TDS" means Total Dissolved Solids;

(mmmm) "topsoil" means the uppermost layer of soil and consists of:

(i) the A-horizons and all organic horizons as defined in *The Canadian System of Soil Classification* (Third Edition), Agriculture and Agri-Food Canada, Publication 1646, 1998, as amended, and

(ii) the soil ordinarily moved during tillage;

(nnnn) "TSS" means Total Suspended Solids;

(oooo) "upper subsoil" means the layer of soil directly below the topsoil layer that consists of the B-horizons as defined in *The Canadian System of Soil Classification,* (Third Edition), Agriculture and Agri-Food Canada, Publication 1646, 1998, as amended;

(pppp) "volume estimate" means a technical evaluation based on the sources contributing to the release including but not limited to pump capabilities, water meters, and batch release volumes;

(qqqq) "waste stabilization area" means the portion of the landfill that is used for waste stabilization or solidification or both, as described in application no. 008-10348;

(rrrr) "waste storage area" means the areas designated for storage of containers for waste or hazardous recyclable or both, or for storage of tanks for waste or hazardous recyclable or both, or for storage of both, as described in application No. 005-10348;

(ssss) "week" means any consecutive 7-day period;

(tttt) "working face" means that portion of the active landfill area where waste is currently being deposited, spread and compacted; and

(uuuu) "year" means calendar year.

PART 2: GENERAL

SECTION 2.1: REPORTING

2.1.1 The approval holder shall immediately report to the Director by telephone any contravention of the terms and conditions of this approval at 1-780-422-4505.

2.1.2 The approval holder shall submit a written report to the Director within 7 days of the reporting pursuant to 2.1.1.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

2.1.3 The approval holder shall immediately notify the Director in writing if any of the following events occurs:

(a) the approval holder is served with a petition into bankruptcy;

(b) the approval holder files an assignment in bankruptcy or Notice of Intent to make a proposal;

(c) a receiver or receiver-manager is appointed;

(d) an application for protection from creditors is filed for the benefit of the approval holder under any creditor protection legislation; or

(e) any of the assets which are the subject matter of this approval are seized for any reason.

2.1.4 If the approval holder monitors for any substances or parameters which are the subject of operational limits as set out in this approval more frequently than is required and uses procedures authorized in this approval, then the approval holder shall provide the results of such monitoring as an addendum to the reports required by this approval.

2.1.5 The approval holder shall submit all monthly reports required by this approval to be compiled or submitted to the Director on or before the end of the month following the month in which the information was collected, unless otherwise specified in this approval.

2.1.6 The approval holder shall submit all annual reports required by this approval to be compiled or submitted to the Director on or before March 31 of the year following the year in which the information was collected, unless otherwise specified in this approval.

SECTION 2.2: RECORD KEEPING

2.2.1 The approval holder shall:

(a) record; and

(b) retain

all the following information in respect of any sampling conducted or analyses performed in accordance with this approval for a minimum of ten years, unless otherwise authorized in writing by the Director:

(i) the place, date and time of sampling,

(ii) sample type,

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(iii) the dates the analyses were performed,

(iv) the analytical techniques, methods or procedures used in the analyses,

(v) the names of the persons who collected and analysed each sample, and

(vi) the results of the analyses.

2.2.2 The approval holder shall keep and maintain an Operating Record of the landfill as per 4.6.34(a) until the end of the landfill post-closure.

2.2.3 The Operating Record referred to in 2.2.2 shall include, at a minimum, all of the following information:

(a) the information required in section 7.3(c) of the *Standards for Landfills in Alberta*, as amended;

(b) the name and contact information of all persons who discover any contravention;

(c) the names and contact information of all persons who take any remedial actions arising from the contravention of the Act, the regulations, or this approval; and

(d) a description of the remedial measures taken in respect of a contravention of the Act, the regulations, or this approval.

2.2.4 The approval holder shall submit a copy of the most recent Operating Record to the Director upon written request from the Director within the timeline specified in writing by the Director.

SECTION 2.3: ANALYTICAL REQUIREMENTS

2.3.1 With respect to any sample required to be taken pursuant to this approval, the approval holder shall ensure that:

(a) collection;

(b) preservation;

(c) storage;

(d) handling; and

(e) analysis

TERMS AND CONDITIONS ATTACHED TO APPROVAL

shall be conducted in accordance with the following unless otherwise authorized in writing by the Director:

(i) for air:

(A) the *Alberta Stack Sampling Code*, Alberta Environment, 1995, as amended,

(B) the *Methods Manual for Chemical Analysis of Atmospheric Pollutants*, Alberta Environment, 1993, as amended, and

(C) the *Air Monitoring Directive*, Alberta Environment, 1989, as amended;

(ii) for industrial wastewater, industrial runoff, groundwater and domestic wastewater:

(A) the *Standard Methods for the Examination of Water and Wastewater*, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation, 1998, as amended;

(iii) for whole effluent toxicity tests:

(A) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, Environment Canada, Environmental Protection Series 1/RM/13, December 2000, as amended,

(B) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia Magna*, Environment Canada, Environmental Protection Series 1/RM/14, December 2000, as amended,

(C) the *Biological Test Method: Growth Inhibition Test Using the Freshwater Alga Selenastrum capricornutum*, Environment Canada, Environmental Protection Series, November 1992, as amended,

(D) the *Biological Test Method: Test of Reproduction and Survival Using the Cladoceran Ceriodaphnia dubia*, Environment Canada, Environmental Protection Series 1/RM/21, February 1992, as amended,

(E) the *Biological Test Method: Test of Larval Growth and Survival Using Fathead Minnows*, Environment Canada,

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Environmental Protection Series 1/RM/22, February 1992, as amended, and

(F) the *Biological Test Method: Toxicity Test Using Luminescent Bacteria (Photobacterium phosphoreum)*, Environment Canada, Environmental Protection Series, 1/RM/24, November 1992, as amended;

(iv) for soil:

(A) the *Soil Monitoring Directive,* Alberta Environment, May 2009, as amended, and

(B) the *Soil Quality Criteria Relative to Disturbance and Reclamation*, Alberta Agriculture, March 1987, as amended; and

(v) for waste:

(A) the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, USEPA, SW-846, September 1986, as amended,

(B) the *Methods Manual for Chemical Analysis of Water and Wastes*, Alberta Environmental Centre, Vegreville, Alberta, 1996, AECV96-M1, as amended,

(C) the *Toxicity Characteristic Leaching Procedure (TCLP)* USEPA Regulation 40 CFR261, Appendix II, Method No. 1311, as amended, or

(D) the *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, American Water Works Association, and the Water Environment Federation, 2010, as amended.

2.3.2 The approval holder shall analyse all samples that are required to be obtained by this approval in a laboratory accredited pursuant to ISO/IEC 17025, as amended, for the specific parameter(s) to be analysed, unless otherwise authorized in writing by the Director.

2.3.3 The term sample used in 2.3.2 does not include samples directed to continuous monitoring equipment, unless specifically required in writing by the Director.

2.3.4 The approval holder shall comply with the terms and conditions of any written authorization issued by the Director under 2.3.2.

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SECTION 2.4: OTHER

2.4.1 The terms and conditions of this approval are severable. If any term or condition of this approval or the application of any term or condition is held invalid, the application of such term or condition to other circumstances and the remainder of this approval shall not be affected thereby.

2.4.2 Any conflict between the *Standards for Landfills in Alberta*, as amended, and the terms and conditions of this approval shall be resolved in favour of this approval.

2.4.3 *Environmental Protection and Enhancement Act* Approval No. 10348-02-00, as amended, is cancelled.

2.4.4 All tanks shall conform to the *Guidelines for Secondary Containment for Above Ground Storage Tanks,* Alberta Environmental Protection, 1997, as amended, unless otherwise authorized in writing by the Director.

2.4.5 All above ground storage tanks containing liquid hydrocarbons or organic compounds shall conform to the *Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks*, Canadian Council of Ministers of the Environment, PN 1180, 1995, as amended.

PART 3: CONSTRUCTION

SECTION 3.1: LANDFILL

3.1.1 The approval holder shall not commence construction of Cell 4 unless and until updated financial security of the facility has been provided to include Cell 4 lateral expansion.

3.1.2 The approval holder shall construct each new Class I industrial landfill cell in such a way that each new Class I landfill cell shall consist of the following components, at a minimum, unless otherwise authorized in writing by the Director:

(a) a minimum of 0.45 metre thick cover of clean sand or soil placed over top of the uppermost drainage layer;

(b) a composite liner that consists of, at a minimum:

(i) a GCL liner placed in direct contact with an underlying 80 mil HDPE geomembrane liner as a primary liner;

(ii) a GCL liner placed in direct contact with an underlying 80 mil HDPE geomembrane liner as a secondary liner; and

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(iii) a GCL liner placed in direct contact with an underlying clay liner that has:

(A) a minimum thickness of 1.0 metre at all points, measured perpendicular to the slope, and

(B) been compacted to achieve an in-place hydraulic conductivity of 1×10^{-9} m/s or less;

(c) a leachate collection system that:

(i) is placed over the primary liner;

(ii) is capable of maintaining the maximum acceptable leachate head; and

(iii) consists of:

(A) a geo-composite drainage layer with a transmissivity of at least 1×10^{-4} m^2/s placed over top of the primary liner,

(B) a network of perforated leachate collection pipes, and

(C) a leachate collection sump placed over the primary liner;

(d) a leak detection system that:

(i) is installed over the secondary liner;

(ii) is capable of detecting the leakage through the primary liner; and

(iii) consists of:

(A) a geo-composite drainage layer with a transmissivity of at least 1×10^{-4} m^2/s placed over top of the secondary liner,

(B) a network of perforated leak detection liquid collection pipes, and

(C) a leak detection liquid collection sump placed over the secondary liner;

(e) a final cover:

(i) that meets the requirements in section 6.1(c) of the *Standards for Landfills in Alberta*, as amended; or

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(ii) as specified in the Landfill Cell Closure Plan submitted by the approval holder and authorized in writing by the Director pursuant to 7.1.1 and 7.1.4;

(f) a run-on control system capable of preventing flow onto the active landfill area from at least the peak discharge from a 1 in 25 year, 24 hour duration storm event at the facility; and

(g) a runoff control system capable of collecting and controlling at least the runoff volume resulting from a 1 in 25 year, 24 hour duration storm event at the facility.

3.1.3 The composite liner for the landfill shall be constructed on a foundation or base such that there shall be no failure of the liners due to settlement, compression, or uplift.

3.1.4 The approval holder shall submit to the Director the following plans and specifications for the proposed construction of each of the items listed in 3.1.2, signed and stamped by a professional registered with APEGA at least three (3) months prior to construction:

(a) a Detailed Construction Plan and Specifications prepared as per 3.1.2;

(b) a Construction Quality Assurance Plan; and

(c) a Construction Quality Control Plan.

3.1.5 If the Detailed Construction Plan and Specifications in 3.1.4 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

3.1.6 The approval holder shall implement the Detailed Construction Plan and Specifications in 3.1.4 as authorized in writing by the Director.

3.1.7 During construction of any of the items listed in 3.1.2, the approval holder shall not deviate from the Detailed Construction Plan and Specifications as authorized in writing by the Director in 3.1.6, unless the following conditions are met:

(a) the deviation results in a minor adjustment to the Detailed Construction Plan and Specifications in order to suit field conditions encountered; and

(b) the deviation will result in an equivalent or better design performance of the landfill.

3.1.8 The approval holder shall submit to the Director a summary report of the Construction Quality Assurance and Construction Quality Control results signed and stamped by a professional registered with APEGA.

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3.1.9 The summary report in 3.1.8 shall contain the following information, at a minimum:

(a) confirmation that the landfill has been constructed according to:

(i) the Construction Quality Assurance Plan,

(ii) the Construction Quality Control Plan, and

(iii) the Detailed Construction Plan and Specifications as authorized in writing by the Director in 3.1.6, subject to the deviations as per 3.1.7;

(b) description of any minor deviations as per 3.1.7;

(c) confirmation by the professional registered with APEGA, that deviations as per 3.1.7 will result in an equivalent or better design performance of the landfill;

(d) "as-built" plans;

(e) photo-documentation of important stages of construction including any repair work or remediation activities to establish or maintain liner integrity; and

(f) any other information as required in writing by the Director.

3.1.10 The approval holder shall notify the Director in writing at least fourteen (14) days prior to commencing operations of any new landfill cell.

3.1.11 The approval holder shall construct the off-loading area (tipping area) as described in the application, unless otherwise authorized in writing by the Director.

3.1.12 The approval holder shall manage landfill progression in such a manner as to minimize off-site visual impacts of the landfill, as described in the Landfill Cell Closure Plan submitted by the approval holder and authorized in writing by the Director pursuant to 7.1.1 and 7.1.4.

SECTION 3.2: WASTE STABILIZATION AREA

3.2.1 The approval holder shall construct the waste stabilization area in accordance with the following:

(a) application No. 008-10348; and

(b) within a Class I landfill cell;

unless otherwise authorized in writing by the Director.

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SECTION 3.3: SOIL CONSERVATION

3.3.1 The approval holder shall:

(a) salvage; and

(b) conserve

all topsoil for land reclamation of the landfill.

3.3.2 The approval holder shall:

(a) salvage; and

(b) conserve

all upper subsoil for land reclamation of the landfill.

3.3.3 The approval holder shall:

(a) conserve; and

(b) stockpile

all topsoil separately from the upper subsoil.

3.3.4 The approval holder shall place all:

(a) topsoil stockpiles; and

(b) upper subsoil stockpiles

at the landfill.

3.3.5 The approval holder shall stockpile all topsoil as follows:

(a) on stable foundations; and

(b) on undisturbed topsoil.

3.3.6 The approval holder shall stockpile all upper subsoil as follows:

(a) on stable foundations; and

(b) on areas where the topsoil has been removed.

3.3.7 The approval holder shall take all steps necessary to prevent any erosion (e.g., wind or water), including but not limited to, all of the following:

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(a) revegetating the stockpiles; and

(b) any other steps authorized in writing by the Director.

3.3.8 The approval holder shall immediately suspend conservation of:

(a) topsoil; and

(b) upper subsoil

when:

(i) wet or frozen conditions will result in mixing, loss, degradation or compaction of topsoil or upper subsoil, or

(ii) high wind velocities, any other field conditions or facility operations will result in mixing, loss, or degradation of topsoil or upper subsoil.

3.3.9 The approval holder shall recommence conservation of:

(a) topsoil; and

(b) upper subsoil

only when conditions in 3.3.8 no longer exist.

PART 4: OPERATIONS, LIMITS, MONITORING AND REPORTING

SECTION 4.1: GENERAL

4.1.1 The approval holder shall maintain the geographical boundaries of the landfill to that located within SE 1/4 of Section 9, Township 50, Range 17, West of the 4th Meridian, as described in the application.

4.1.2 The approval holder shall limit the waste elevation of the landfill to no more than the maximum designated waste elevation.

4.1.3 The approval holder shall restrict access to the facility to only personnel authorized by the approval holder.

4.1.4 The approval holder shall maintain a publicly available 24 hour "HOTLINE" number for a prompt response during an emergency.

4.1.5 The approval holder shall:

(a) operate; and

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(b) maintain the integrity of

the following waste management facilities at the facility:

(i) the HWRSP Facility;

(ii) the Class I and Class II industrial landfill, including:

(A) Class I landfill cells,

(B) Class II landfill cell(s), and

(C) waste stabilization area within a Class I landfill cell; and

(iii) waste storage area(s);

as described in the application.

4.1.6 In addition to 4.1.5, the approval holder shall:

(a) operate; and

(b) maintain the integrity of

the following infrastructure components at the facility:

(i) the composite liner;

(ii) the leachate collection system,

(iii) the leak detection system,

(iv) the run-on control system,

(v) the runoff control system,

(vi) the groundwater monitoring wells,

(vii) the weigh scale, and

(viii) the site access control;

as described in the application.

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FACILITY AUDIT

4.1.7 The approval holder shall cause the facility to be audited by an independent third-party environmental consultant or organization to assess compliance with the terms and conditions of this approval:

(a) at least once every three years; and

(b) commencing on or before October 1, 2018 for the first audit.

4.1.8 The approval holder shall submit the audit report required in 4.1.7 in the Annual Landfill Operations Report as required in 4.6.58(c).

4.1.9 The requirements in 4.1.7 and 4.1.8 shall not relieve the approval holder of any duty under the Act, or its associated regulations, or this approval.

SECTION 4.2: AIR

OPERATIONS

4.2.1 The approval holder shall not release any air effluent streams to the atmosphere except as authorized by this approval.

4.2.2 The approval holder shall only release air effluent streams to the atmosphere from the following sources:

(a) the scrubber exhaust stack;

(b) the Drum Processing Building natural gas fired air make up unit exhaust vent;

(c) the Staging Building natural gas fired air make up unit exhaust vent;

(d) the Administration Building natural gas fired furnaces exhaust vents;

(e) the Laboratory fume hood and natural gas fired air make up unit exhaust vents;

(f) the Maintenance Shop equipment and natural gas fired Radiant Heater exhaust vents;

(g) the Leachate Collection Tanks natural gas fired heaters exhaust vents;

(h) the leachate transfer lines passive gas vents; and

(i) any other source authorized in writing by the Director.

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4.2.3 The approval holder shall not operate any process equipment unless and until the pollution abatement equipment associated with the corresponding process equipment is:

(a) operational; and

(b) operating.

4.2.4 The approval holder shall treat all air effluent streams from the exhaust vents of the Drum Processing or Staging or both Buildings with a caustic scrubber and an activated carbon filter before directing the air effluent streams to the scrubber exhaust stack for release to the atmosphere while:

(a) hazardous waste or hazardous recyclables or both are being processed;

(b) hazardous waste or hazardous recyclables or both are being transferred; or

(c) containers of hazardous waste or hazardous recyclables or both are open

in the Drum Processing or Staging or both Buildings.

4.2.5 The approval holder shall control fugitive emissions and any source not specified in 4.2.2 in accordance with 4.2.6 of this approval unless otherwise authorized in writing by the Director.

4.2.6 With respect to fugitive emissions and any source not specified in 4.2.2, the approval holder shall not release a substance or cause to be released a substance that causes or may cause any of the following:

(a) impairment, degradation or alteration of the quality of natural resources;

(b) material discomfort, harm or adverse effect to the well being or health of a person; or

(c) harm to property or to vegetative or animal life.

4.2.7 The approval holder shall not burn any debris by means of an open fire unless authorized in writing by the Director.

4.2.8 If the approval holder receives complaints of offensive odours, or fugitive dust, or both, beyond the facility boundaries, the approval holder shall:

(a) conduct the following to reduce the release of those odours, or fugitive dust, or both by:

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(i) placing restrictions on types, or volumes, or both, of the wastes being handled or processed or deposited that are causing those odours, or fugitive dust, or both,

(ii) increasing the frequency of cover placement, or modifying waste handling activities, or performing both, at the landfill,

(iii) modifying waste handling activities at the HWRSP Facility, or

(iv) performing any combination of the above; and

(b) activate the Odour and Fugitive Dust Response Program as specified in the Landfill Operations Plan 4.6.34(j).

LIMITS

4.2.9 The approval holder shall maintain the pH of the scrubbing liquid of the caustic scrubber referred to in 4.2.4 at 8.0 or higher.

4.2.10 The approval holder shall replace activated carbon in the activated carbon filter referred to in 4.2.4 immediately when the concentration of total petroleum hydrocarbons in the air effluent streams released from the scrubber exhaust stack to the atmosphere exceeds 25 ppm.

MONITORING AND REPORTING

4.2.11 The approval holder shall monitor, daily at a minimum, the pH of the scrubbing liquid of the caustic scrubber referred to in 4.2.4.

4.2.12 The approval holder shall monitor, weekly at a minimum, the air effluent streams released from the scrubber exhaust stack, using a portable total petroleum hydrocarbon analyzer while:

(a) hazardous waste or hazardous recyclables or both are being processed;

(b) hazardous waste or hazardous recyclables or both are being transferred; or

(c) containers of hazardous waste or hazardous recyclables or both are open

in the Drum Processing or Staging or both Buildings.

4.2.13 The portable total petroleum hydrocarbon analyzer referred to in 4.2.12 shall:

(a) have a detection limit of 1 ppm or lower for total petroleum hydrocarbons;

(b) be located in a straight section of the scrubber exhaust stack, a minimum of one (1) metre downstream from the last flow disturbance; and

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(c) be calibrated regularly in accordance with the analyzer manufacturer's specifications.

4.2.14 The approval holder shall continue to implement the Ambient Air Monitoring Program as authorized in writing by the Director on June 24, 2009, unless and until otherwise authorized in writing by the Director pursuant to 4.2.18.

4.2.15 The approval holder shall submit to the Director the results of the Ambient Air Monitoring Program in 4.2.14 with the following reports:

(a) a Monthly Ambient Air Monitoring Report; and

(b) an Annual Ambient Air Monitoring Report

in accordance with the written authorization by the Director on June 24, 2009, unless and until otherwise authorized in writing by the Director pursuant to 4.2.18.

4.2.16 The approval holder shall submit:

(a) a revised Ambient Air Monitoring Program;

(b) revised reporting requirements, or

(c) both of the above

to the Director upon written request from the Director within the timeline specified in writing by the Director.

4.2.17 If the revised:

(a) Ambient Air Monitoring Program;

(b) reporting requirements; or

(c) both of the above

submitted pursuant to 4.2.16 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

4.2.18 The approval holder shall implement the revised:

(a) Ambient Air Monitoring Program;

(b) reporting requirements; or

(c) both of the above

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submitted pursuant to 4.2.16 as authorized in writing by the Director within the timeline specified in writing by the Director.

SECTION 4.3: RUNOFF AND INDUSTRIAL WASTEWATER

OPERATIONS

4.3.1 The approval holder shall not release any substances from the facility to the surrounding watershed except as authorized by this approval.

4.3.2 The approval holder shall operate and maintain the integrity of:

(a) the run-on control system to prevent flow onto the active landfill area from at least the peak discharge from a 1 in 25 year, 24 hour duration storm event at the facility; and

(b) the runoff control system for the facility to collect and control at least the runoff volume resulting from a 1 in 25 year, 24 hour duration storm event at the facility.

4.3.3 All runoff from the facility developed area shall be directed to the runoff control system as described in:

(a) application No. 012-10348, prior to decommissioning and reclamation of the old surface water detention pond; and

(b) the application, after decommissioning and reclamation of the old surface water detention pond;

unless otherwise authorized in writing by the Director.

4.3.4 Prior to decommissioning and reclamation of the old surface water detention pond and subject to 4.3.7, the approval holder shall only make or permit a release from the old surface water detention pond:

(a) at the release point as designated in application No. 012-10348, which is:

(i) located in the south east corner of the old surface water detention pond, and

(ii) referred to as sampling location A1 in 4.3.11;

(b) through a pump and a release hose over the south berm into the drainage control ditch, east of the landfill access road, to the new surface water detention pond, under normal operating conditions; and

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(c) through a pump and a release hose over the south berm directly to the culvert under Highway 854, during periods of high runoff exceeding the holding capacity of the old surface water detention pond;

unless otherwise authorized in writing by the Director.

4.3.5 Subject to 4.3.7, the approval holder shall only make or permit a release from the new surface water detention pond:

(a) at the release point as designated in application No. 012-10348, which is:

(i) located in the north east corner of the new surface water detention pond, and

(ii) referred to as sampling location B1 in 4.3.11; and

(b) through a pump and a release hose over the east berm into the culvert under Highway 854;

unless otherwise authorized in writing by the Director.

4.3.6 The approval holder shall only dispose of industrial wastewaters, or specified runoff in TABLE 4.3-A, or both, by one or more of the following methods:

(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER;

(d) as per 4.6.51; or

(e) as otherwise authorized in writing by the Director.

TABLE 4.3-A: SPECIFIED RUNOFF

SOURCES
Runoff that exceeds any of the limits for the parameters listed in TABLE 4.3-B.
Runoff for which the results of the parameters listed in TABLE 4.3-B are unavailable at the time that the runoff must be disposed of.
Runoff from within the tank farm bermed area.

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LIMITS

4.3.7 Releases of runoff from:

(a) the old surface water detention pond;

(b) the new surface water detention pond; or

(c) both ponds

to the surrounding watershed shall comply with the limits specified in TABLE 4.3-B.

4.3.8 Releases of runoff from within the tank farm bermed area to the old or new or both surface water detention ponds shall comply with the limits specified in TABLE 4.3-C.

TABLE 4.3-B: RUNOFF LIMITS FOR SURFACE WATER DETENTION POND

PARAMETER	LIMITS Maximum unless otherwise indicated
pH	6.0 – 9.5 pH units
COD	50 mg/L
TDS	2500 mg/L
TSS	25 mg/L
Ammonia (expressed as Nitrogen)	5 mg/L
Chloride	250 mg/L
Sodium	200 mg/L
Sulphate	500 mg/L
Oil or other substances	Not present in amounts sufficient to create a visible film or sheen
96-Hour Multiple Concentration Acute Lethality Test Using Rainbow Trout (*Oncorhynchus mykiss*)	50% or greater survival

TABLE 4.3-C: RUNOFF LIMITS FOR TANK FARM BERMED AREA

PARAMETER	LIMITS Maximum unless otherwise indicated
pH	6.0 – 9.5 pH units
COD	50 mg/L
TSS	25 mg/L
Ammonia (expressed as Nitrogen)	5 mg/L
Oil or other substances	Not present in amounts sufficient to create a visible film or sheen

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MONITORING AND REPORTING

4.3.9 The approval holder shall monitor the runoff control system as required in TABLE 4.3-D, subject to 4.3.12.

4.3.10 The approval holder shall report to the Director the results of the runoff control system monitoring as required in TABLE 4.3-D, subject to 4.3.12.

4.3.11 For the purpose of TABLE 4.3-D:

(a) sampling location A1 is defined as the old surface water detention pond release point;

(b) sampling location A2 is defined as the old surface water detention pond;

(c) sampling location B1 is defined as the new surface water detention pond release point;

(d) sampling location B2 is defined as the new surface water detention pond; and

(e) sampling location C is defined as the tank farm bermed area.

4.3.12 The monitoring and reporting requirements in 4.3.9 and 4.3.10 for the old surface water detention pond (sampling locations A1 and A2) shall not apply after decommissioning and reclamation of the old surface water detention pond.

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TABLE 4.3-D: RUNOFF CONTROL SYSTEM MONITORING AND REPORTING

MONITORING				REPORTING	
Parameter	**Frequency**	**Sample Type**	**Sampling Location**	**Monthly**	**Annually**
Surface Water Detention Pond(s)				Monthly Runoff and Industrial Wastewater Report, for each month when release occurs	Annual Runoff and Industrial Wastewater Report
Flow (m^3/day)	Daily during release	Estimate	A1, B1		
pH	Once per batch release, prior to release	Representative Grab	A2, B2		
COD					
TDS					
TSS					
Ammonia (expressed as nitrogen)					
Chloride					
Sodium					
Sulphate					
Oil or other substances	Daily during release	Visual			
96-hour multiple concentration acute lethality test using rainbow trout (*oncorhynchus mykiss*)	Each month when release occurs, prior to release, for the first batch release of the month	Representative Grab			
48-hour static acute lethality test using *daphnia magna*					
Tank Farm Bermed Area					
Volume (m^3)	Total batch volume released	Estimate	C		
pH	Once per batch release, prior to release to the surface water detention pond(s)	Representative Grab			
COD					
TSS					
Ammonia (expressed as nitrogen)					
Oil or other substances		Visual			

4.3.13 The monitoring and reporting required in TABLE 4.3-D for the acute lethality tests shall comply with:

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(a) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, Environment Canada, Environmental Protection Series 1/RM/13, December2000, as amended; and

(b) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia Magna*, Environment Canada, Environmental Protection Series 1/RM/14, December 2000, as amended.

4.3.14 The approval holder shall:

(a) treat any acute lethality test that deviates from the corresponding test method referred to in 4.3.13 as invalid; and

(b) repeat the test as soon as logistically possible.

4.3.15 In the event that less than 50% of the rainbow trout survived in the 100% concentration sample, the approval holder shall:

(a) implement a program immediately to identify the source of the toxicity; and

(b) submit to the Director within 90 days after the test result is available, a proposed program to reduce the toxicity of the runoff.

4.3.16 The approval holder shall submit the Monthly Runoff and Industrial Wastewater Report in TABLE 4.3-D to the Director.

4.3.17 The Monthly Runoff and Industrial Wastewater Report shall include, at a minimum, all of the following information:

(a) a monthly assessment of the monitoring results relative to the limits in TABLE 4.3-B;

(b) a monthly assessment of the monitoring results relative to the limits in TABLE 4.3-C;

(c) a monthly assessment of the performance of the:

(i) runoff control system,

(ii) pollution abatement equipment, and

(iii) monitoring equipment;

(d) a monthly summary of management and disposal of the:

(i) industrial wastewaters, and

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(ii) specified runoff

as per 4.3.6;

(e) a monthly summary of management and disposal of runoff in general;

(f) a monthly summary of runoff contraventions reported pursuant to 2.1.1; and

(g) any other information as required in writing by the Director.

4.3.18 The approval holder shall submit the Annual Runoff and Industrial Wastewater Report in TABLE 4.3-D to the Director.

4.3.19 The Annual Runoff and Industrial Wastewater Report shall include, at a minimum, all of the following information:

(a) an annual summary assessment of the monitoring results relative to the limits in TABLE 4.3-B;

(b) an annual summary assessment of the monitoring results relative to the limits in TABLE 4.3-C;

(c) an annual summary assessment of the performance of the:

(i) runoff control system,

(ii) pollution abatement equipment, and

(iii) monitoring equipment;

(d) an annual summary of management and disposal of the:

(i) industrial wastewaters, and

(ii) specified runoff

as per 4.3.6;

(e) an annual summary and evaluation of management and disposal of runoff in general;

(f) an annual summary of the results pursuant to 4.3.21;

(g) an annual summary of runoff contraventions reported pursuant to 2.1.1; and

(h) any other information as required in writing by the Director.

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4.3.20 The approval holder shall:

(a) collect a representative grab sample from the old surface water detention pond at least once per year, prior to decommissioning and reclamation of the pond;

(b) collect a representative grab sample from the new surface water detention pond at least once per year; and

(c) analyze the sample(s) for all of the parameters specified in TABLE 4.3-E.

4.3.21 The approval holder shall submit the results of the analyses in 4.3.20 to the Director in the Annual Runoff and Industrial Wastewater Report.

TABLE 4.3-E: ANNUAL MONITORING OF SURFACE WATER DETENTION POND

PARAMETERS			
pH	TDS; TSS	Fluoride, dissolved	Phenols
Electrical conductivity	Metals	Cyanide (weak acid dissociable)	Total chlorinated phenols
COD	Major ions	BTEX	Polychlorinated biphenyls, total
DOC	Nutrients	Petroleum Hydrocarbons Fractions F1 and F2	Total organic halogens

SECTION 4.4: LEACHATE COLLECTION AND LEAK DETECTION

OPERATIONS

4.4.1 The approval holder shall only dispose of leachate removed from the leachate collection system by one or more of the following methods:

(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER; or

(d) as per 4.6.51.

4.4.2 The approval holder shall only dispose of liquid removed from the leak detection system by one or more of the following methods:

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER; or

(d) as per 4.6.51.

LIMITS

4.4.3 Subject to 4.4.4, the approval holder shall not exceed the maximum acceptable leachate head in any landfill cell.

4.4.4 Subsequent to a storm event, the leachate head in any landfill cell shall not exceed the maximum acceptable leachate head for more than fourteen (14) days, unless otherwise authorized in writing by the Director.

4.4.5 The volume of liquid in the leak detection system, as monitored in TABLE 4.6-D, shall not exceed the action leakage rate in any landfill cell.

MONITORING AND REPORTING

4.4.6 The approval holder shall monitor the leachate collection and leak detection systems as required in TABLE 4.6-D and for all parameters specified in TABLE 4.4-A, subject to 4.4.8 and 4.4.9.

4.4.7 The approval holder shall report to the Director the results of the leachate collection and leak detection systems monitoring as required in TABLE 4.6-D, including the results of the analyses for all parameters specified in TABLE 4.4-A, subject to 4.4.8 and 4.4.9.

TABLE 4.4-A: LEACHATE AND LEAK DETECTION LIQUID MONITORING

PARAMETERS		
pH (field and laboratory)	TDS	Nutrients
Electrical conductivity (field and laboratory)	TSS	BTEX
COD	Metals	Phenols
DOC	Major Ions	Petroleum Hydrocarbons Fractions F1 and F2

4.4.8 The requirements in 4.4.6 and 4.4.7 for monitoring and reporting the parameters in TABLE 4.4-A for leachate shall not apply if insufficient leachate is available for conducting the analyses.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.4.9 The requirements in 4.4.6 and 4.4.7 for monitoring and reporting the parameters in TABLE 4.4-A for leak detection liquid shall not apply if insufficient leak detection liquid is available for conducting the analyses.

4.4.10 If the volume of liquid removed from the leak detection system exceeds the action leakage rate, in addition to reporting pursuant to 2.1.1, the approval holder shall submit a Response Action Plan to the Director within 30 days of the exceedance.

SECTION 4.5: DUGOUTS AND WATER WELLS IN SURROUNDING AREA

MONITORING AND REPORTING

4.5.1 The approval holder shall:

(a) collect a representative sample from:

(i) each of the dugouts, and

(ii) each of the water wells

within an approximate 1.6 kilometre radius around the facility; and

(b) analyze the sample for the parameters listed in TABLE 4.5-A;

unless the approval holder is not granted access by the landowner.

4.5.2 The monitoring required in 4.5.1 shall be conducted once each year in October unless otherwise authorized in writing by the Director.

4.5.3 The approval holder shall record the analytical results of the sampling information required in 4.5.1 in an Annual Dugout and Water Well Sampling Program Report.

4.5.4 The approval holder shall submit the Annual Dugout and Water Well Sampling Program Report to the Director pursuant to 4.6.58(i).

TABLE 4.5-A: DUGOUT AND WATER WELL MONITORING

PARAMETERS		
pH (field and laboratory)	TDS	Nutrients
Electrical conductivity (field and laboratory)	TSS	BTEX
COD	Metals	Phenols
DOC	Major Ions	Petroleum Hydrocarbons Fractions F1 and F2

TERMS AND CONDITIONS ATTACHED TO APPROVAL

SECTION 4.6: HWRSP FACILITY AND LANDFILL

GENERAL

4.6.1 The approval holder shall not:

(a) receive;

(b) process;

(c) dispose of; or

(d) perform any combination of the above for

any of the following wastes, individually or in any combination, at the places specified below respectively:

(i) explosives (Class 1 TDGR wastes), at the facility;

(ii) radioactive wastes (Class 7 TDGR wastes), at the facility;

(iii) radioactive wastes regulated under the *Nuclear Safety and Control Act* (Canada), at the facility;

(iv) biomedical waste, at the facility;

(v) waste containing free liquids, at the landfill, excluding the waste stabilization area;

(vi) material containing ozone depleting substances, at the landfill;

(vii) municipal solid waste, at the facility; and

(viii) NORM waste, at the facility.

4.6.2 Incompatible wastes and incompatible hazardous recyclables shall be prevented from mixing.

4.6.3 The approval holder shall dispose of wastes generated at the facility only:

(a) to facilities holding a current Act authorization;

(b) to facilities approved by a local environmental authority outside of Alberta; or

(c) as otherwise authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

HWRSP FACILITY

OPERATIONS PLAN

4.6.4 The approval holder shall:

(a) develop;

(b) keep up-to-date; and

(c) implement

an HWRSP Facility Operations Plan.

4.6.5 The approval holder shall:

(a) review the HWRSP Facility Operations Plan annually, at a minimum; and

(b) update the HWRSP Facility Operations Plan if any of the following circumstances apply:

(i) there are facility expansions or changes in site operations or equipment,

(ii) there is an applicable change to an applicable regulation, or

(iii) an update is required in writing by the Director.

4.6.6 The approval holder shall retain a copy of the most recent HWRSP Facility Operations Plan at the facility.

4.6.7 The approval holder shall submit a copy of the most recent HWRSP Facility Operations Plan to the Director upon written request from the Director within the timeline specified in writing by the Director.

4.6.8 If the HWRSP Facility Operations Plan submitted pursuant to 4.6.7 is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

4.6.9 The approval hold shall implement the latest HWRSP Facility Operations Plan, unless otherwise authorized in writing by the Director.

OPERATIONS

4.6.10 The approval holder shall only transfer wastes and hazardous recyclables at designated transfer areas designed to contain spills and leaks.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.6.11 The approval holder shall use the following when transferring substances to, from, and between containers, tanks, and trucks:

(a) couplings equipped with seals that are compatible with the substance transferred;

(b) the necessary precautions to prevent spills when the couplings are disconnected;

(c) emergency shut-off valves;

(d) established transfer areas and associated curbing, paving and catchment areas;

(e) drip trays to capture potential losses under coupling devices and other connections; and

(f) manual inspections of the transfer area for leaks and spills during and after waste transfer.

4.6.12 All wastes and all hazardous recyclables that are unloaded shall be immediately transferred to the waste storage area.

4.6.13 All containers and unrinsed empty containers shall be stored in the waste storage area.

4.6.14 The approval holder shall:

(a) provide and maintain an adequate aisle space between containers in the waste storage area to allow:

(i) inspection, and

(ii) unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of the waste storage area; and

(b) arrange inspection aisles in the waste storage area such that the identification label on each container is readable.

4.6.15 All tanks within the tank farm area shall be equipped, at a minimum, with all of the following:

(a) sensors for detecting the level in each tank;

(b) high level alarms that activate when a tank overfill is imminent;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(c) automatic shut-off devices or sufficient free board space above the high level sensor to allow operators time to prevent overfill from occurring; and

(d) earthen dikes or equivalent secondary containment structures capable of containing 110% of the volume of the largest tank within the bermed area plus 10% of the aggregate capacity of all other tanks in the bermed area.

4.6.16 All tanks containing hazardous waste and all tanks containing hazardous recyclables in each building shall be equipped, at a minimum, with all of the following:

(a) sensors or gauges for detecting the level in each tank;

(b) a written operating procedure to prevent tank overfill; and

(c) secondary containment structures capable of containing 110% of the volume of the largest tank within the building plus 10% of the aggregate capacity of all other tanks containing hazardous waste and hazardous recyclables in the same building.

4.6.17 Hazardous waste and hazardous recyclables stored in containers and tanks shall be stored in accordance with the *Hazardous Waste Storage Guidelines*, June 1988, Alberta Environment, as amended.

4.6.18 The approval holder shall only carry out the following activities, individually or in any combination, at the HWRSP Facility in relation to hazardous waste or hazardous recyclables or both:

(a) commingling of hazardous waste or hazardous recyclables to make maximum use of available container or tank capacity, only if the resultant mixture has the same TDGR hazard classification as any one of the individual components;

(b) phase separation by gravity settling, only without the addition of any chemicals designed to accelerate settling;

(c) dispersion of solids into liquids by natural or mechanical means, only if the resultant mixture has the same TDGR hazard classification as the original waste;

(d) physical segregation of hazardous from non-hazardous articles or components from the same container, only if no process equipment is used;

(e) washing of drums or other objects, only for the purpose of removing hazardous residue;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(f) crushing or shredding of used filters, rags, absorbent materials, or empty containers, only for the purpose of volume reduction or liquid recovery, unless otherwise authorized in writing by the Director; or

(g) treatment of hazardous waste, only as authorized in writing by the Director.

4.6.19 Notwithstanding 4.6.18(g), the approval holder shall not incinerate waste at the facility.

LIMITS

4.6.20 The approval holder shall not store a total of more than 752,500 litres of hazardous waste or hazardous recyclables or both at the HWRSP Facility at any time.

4.6.21 In addition to the storage limits in 4.6.20, the approval holder shall not exceed the waste storage limits as specified in TABLE 4.6-A.

TABLE 4.6-A: STORAGE LIMITS FOR HAZARDOUS WASTE OR HAZARDOUS RECYCLABLES OR BOTH AT HWRSP FACILITY

Waste/Recyclable Type	Material	Maximum Quantity
Containers: Hazardous waste or hazardous recyclables or both	TDGR Classification 2, 3, 4, 5, 6, 8 or 9 waste type only	512,500 litres (consisting of 2,500 drum equivalents, each 205 litre capacity)
Bulk Tanks: Hazardous waste or hazardous recyclables or both	Waste flammable liquids, used oil, or wastewaters; or TDGR Classification 3, 5, 6, 8 or 9 waste type only	240,000 litres (consisting of a total of 135 m^3 in the tank farm area, and a total of 105 m^3 inside the buildings)

4.6.22 Containers other than 205 litre drums shall be prorated to 205 litre drum equivalents based on their nominal volumes, e.g., 10 X 20 litre pails = 1 X 205 litre drum.

4.6.23 The limits referred to in 4.6.20 and 4.6.21 shall be calculated based on the:

(a) total nominal volumes of all containers, treating all partially filled containers as if they were full; and

(b) total filled capacities of all tanks.

MONITORING AND REPORTING

4.6.24 The approval holder shall:

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(a) identify;

(b) characterize; and

(c) classify

all waste streams and all hazardous recyclables, generated or received at the HWRSP Facility, not including runoff, industrial wastewater streams and air effluent streams in accordance with the:

(i) *Industrial Waste Identification and Management Options*, Alberta Environment, May 1996, as amended, and

(ii) *Alberta User Guide for Waste Managers*, Alberta Environment, August 1996, as amended.

4.6.25 The approval holder shall measure or, when not feasible to measure, estimate, the quantity of each waste and hazardous recyclable identified in 4.6.24 each year.

4.6.26 The approval holder shall keep a daily:

(a) total; and

(b) inventory

of all materials being stored at the HWRSP Facility.

4.6.27 The daily total and inventory records in 4.6.26 shall be available at the facility at all times for inspection by the Director or an inspector.

4.6.28 The approval holder shall submit a Monthly Waste Management Report to the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

TABLE 4.6-B: MONTHLY WASTE INVENTORY REPORT (BY WASTE CLASS)

COMPANY NAME: _____ APPROVAL NO.: _____

REPORT PERIOD: MONTH _____ YEAR _____

CLASS	UNIT (Kg or L)	OPENING BALANCE	+ RECEIVED IN PROVINCE	+ RECEIVED OUT OF PROVINCE	- SHIPPED *		- ON-SITE DISPOSAL	+ or - ADJUSTMENT **	CLOSING BALANCE	APPROVAL LIMIT
					RECYCLING / PRODUCT	OFF-SITE DISPOSAL				
2										
3										
4										
5										
6.1										
8										
9.1										
9.2										
9.3										
PCB										
NR										
TOTAL										XXXXX
							No. of Containers On site			XXXXX
							Total Litres in Bulk Tanks			XXXXX

Name of Company Official: _____ Title: _____ Signature: _____

Report Date: _____

* Provide a list of the recycling and disposal locations.

** Identity the amount and reason for each adjustment.
Adjustments include consolidation/reclassification, losses to processing, spills, volume miscalculations, or any other circumstances, which would affect the mass balance of the monthly inventory report.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.6.29 The approval holder shall compile all of the information indicated in TABLE 4.6-B in the Monthly Waste Management Report which shall contain, at minimum, all of the following information:

(a) an opening waste and hazardous recyclables inventory balance in kilograms or litres by waste class or material type;

(b) the amount and type of waste and hazardous recyclables received:

(i) within the province, and

(ii) from outside the province;

(c) the amount and type of waste and hazardous recyclables:

(i) shipped for recycling or product,

(ii) shipped off-site for disposal, and

(iii) disposed on-site;

(d) any adjustments, including but not limited to, consolidation, reclassification, losses to processing, spills, volume miscalculations, or any other circumstances, which would affect the mass balance of the monthly inventory report;

(e) closing balance in kilograms or litres;

(f) a summary of contraventions reported pursuant to 2.1.1 related to waste and hazardous recyclables; and

(g) any other information as required in writing by the Director.

4.6.30 The approval holder shall compile all the information required by 4.6.24 and 4.6.25 in an Annual Waste Management Summary Report:

(a) as specified in TABLE 4.6-C; and

(b) in accordance with the:

(i) *Industrial Waste Identification and Management Options*, Alberta Environment, May 1996, as amended, and

(ii) *Alberta User Guide for Waste Managers*, Alberta Environment, August 1996, as amended.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

TABLE 4.6-C: ANNUAL WASTE MANAGEMENT SUMMARY

Waste or Hazardous Recyclable Name	Uniform Waste Code				Quantity (kg or L)		Stored	Recycled		Disposed	
	WC	PIN	Class	Mgmt	Hazardous	Non-hazardous	On-site	On-site	Off-site	On-site	Off-site
TOTAL											

4.6.31 The approval holder shall submit the Annual Waste Management Summary Report to the Director.

LANDFILL

OPERATIONS PLAN

4.6.32 The approval holder shall:

(a) develop;

(b) keep up-to-date; and

(c) implement

a Landfill Operations Plan that does not contravene with the requirements of this approval.

4.6.33 The approval holder shall:

(a) review the Landfill Operations Plan annually, at a minimum; and

(b) update the Landfill Operations Plan if any of the following circumstances apply:

(i) there are facility expansions or changes in site operations or equipment,

(ii) there is an applicable change to the *Standards for Landfills in Alberta,* as amended,

(iii) an update is required in writing by the Director, or

(iv) there is an update to an applicable regulation.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.6.34 The Landfill Operations Plan shall include, at a minimum, all of the following:

(a) SOP for keeping and maintaining an Operating Record;

(b) SOP for waste control, run-on and runoff controls, and nuisance controls;

(c) SOP for the waste stabilization area operations;

(d) SOP for the acceptance, handling and disposal of wastes, including;

(i) waste characterization and classification at source,

(ii) waste manifesting and tracking,

(iii) QA/QC waste acceptance procedures, and

(iv) waste sampling;

(e) SOP for detecting, preventing and disposal of unauthorized wastes;

(f) SOP for placing waste in a landfill cell including;

(i) working face width,

(ii) lift depth,

(iii) compaction, and

(iv) waste placement location using a grid system;

(g) SOP for managing contaminated sulphur and sulphur containing wastes;

(h) SOP for managing asbestos wastes;

(i) SOP for placing leachate, leak detection liquid, or other authorized wastes and liquids over the surface of the active landfill area for the purpose of evaporation or dust suppression;

(j) an Odour and Fugitive Dust Response Program;

(k) a Fugitive Dust and Odour Best Management Plan;

(l) a runoff and industrial wastewater monitoring and management program;

(m) a leachate monitoring and management program;

(n) a leak detection liquid monitoring and management program;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(o) a groundwater monitoring program;

(p) a Remediation Plan to deal with groundwater quality deterioration;

(q) a soil monitoring program;

(r) a soil management program;

(s) a landfill cell cover system;

(t) a monitoring and maintenance program for the scale house and heavy operational equipment;

(u) a health and safety program;

(v) an emergency response program, including SOP for handling fires, substance releases to the environment, and health concerns; and

(w) an up-to-date plan of the landfill layout with survey records showing the location of all infrastructure components of the landfill including final cover elevations and contours.

4.6.35 The approval holder shall retain a copy of the most recent Landfill Operations Plan at the facility.

4.6.36 The approval holder shall submit to the Director the most recent Landfill Operations Plan when requested in writing by the Director within the timeline specified in writing by the Director.

4.6.37 The approval holder shall correct all deficiencies in the Landfill Operations Plan submitted pursuant to 4.6.36, as outlined in writing by the Director, within the timeline specified in writing by the Director.

4.6.38 The approval holder shall implement the latest Landfill Operations Plan, unless otherwise authorized in writing by the Director.

OPERATIONS

4.6.39 The approval holder shall classify all materials entering the landfill in accordance with the:

(a) *Waste Control Regulation (AR 192/96)*;

(b) *Industrial Waste Identification and Management Options*, Alberta Environment, May 1996, as amended; and

(c) *Alberta User Guide for Waste Managers*, May 1995, as amended.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.6.40 The approval holder shall obtain a detailed representative physical and chemical analysis of a waste prior to disposal of the waste into the landfill at the following times, at a minimum:

(a) the first time a waste is received from a new generator;

(b) the first time a delivery is received from a different process associated with a known waste generator;

(c) the first time a waste is received from a different location associated with a known waste generator; and

(d) when the nature or composition of the waste that was previously characterized by the generator changes.

4.6.41 The approval holder shall not dispose of hazardous waste in any Class II landfill cell.

4.6.42 The approval holder shall:

(a) only carry out waste stabilization or solidification or both within the waste stabilization area; and

(b) not transfer waste from the waste stabilization area to the Class I landfill cell before the waste stabilization or solidification or both have completed.

4.6.43 The approval holder shall only dispose of any liquid collected within the waste stabilization area by one or more of the following methods:

(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER; or

(d) as otherwise authorized in writing by the Director.

4.6.44 The approval holder shall conduct:

(a) annually, in-house visual inspections for corrosion; and

(b) biennially, ultrasonic testing to monitor thickness

of the steel plate liner of the stabilization pits in the waste stabilization area, unless otherwise authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.6.45 The approval holder shall dispose of asbestos wastes in accordance with *"Guidelines for the Disposal of Asbestos Waste"*, Environmental Protection Services, Alberta Environment, 1989, as amended.

4.6.46 The approval holder shall dispose of sulphur waste in accordance with *"Guidelines for Landfill Disposal of Sulphur Wastes and Remediation of Sulphur Containing Soils"*, Alberta Environment, 2011, as amended.

4.6.47 The approval holder shall only dispose of wastes that the landfill is not authorized to dispose of:

(a) to facilities holding a current Act authorization;

(b) to facilities approved by a local environmental authority outside of Alberta; or

(c) as otherwise authorized in writing by the Director.

4.6.48 If an unauthorized waste is received at the landfill, the approval holder shall remove the waste from the landfill within seven (7) days of the receipt, unless otherwise authorized in writing by the Director.

4.6.49 The approval holder shall restrict the working face of each landfill cell to the smallest practical area.

4.6.50 For any waste disposed of at the landfill that is subject to wind dispersal, the approval holder shall:

(a) wet the waste to prevent dispersal of particulate matter; or

(b) immediately apply cover on top of the waste to minimize entrainment of particulate matter.

4.6.51 Notwithstanding 4.6.1(v), the approval holder may place any of the following wastes over the surface of the active landfill area for the purpose of dust suppression:

(a) specified runoff;

(b) leachate;

(c) leak detection liquid;

(d) sump waste of car wash bays or similar operations;

(e) waste from hydrovac excavation operations; or

(f) any other waste authorized by t*he Alberta User Guide for Waste Managers*, May 1995, as amended;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

provided that placement of such wastes will not cause offensive odours.

4.6.52 The approval holder shall inspect the landfill, at a minimum:

(a) weekly; and

(b) immediately after each storm event to:

(i) detect evidence of deterioration of any infrastructure components, including the composite liner,

(ii) detect any malfunction or improper operation of the run-on and runoff control systems, leachate collection system, or leak detection system, and

(iii) take corrective measures to repair any damage to infrastructure components, including the composite liner.

4.6.53 The approval holder shall:

(a) keep a record of inspections conducted pursuant to 4.6.52;

(b) have the record of inspections available for review upon written request from the Director; and

(c) immediately report any deficiencies detected by the inspection in 4.6.52 to the Director in writing along with any corrective measures taken or proposed.

4.6.54 The approval holder shall not stockpile waste exceeding the maximum designated waste elevation of the landfill for a period of more than two (2) weeks, unless otherwise authorized in writing by the Director.

4.6.55 The approval holder shall take all practical measures to prevent off-site tracking of waste from vehicles and equipment leaving the facility.

MONITORING AND REPORTING

4.6.56 The approval holder shall monitor the landfill operations as required in TABLE 4.6-D.

4.6.57 The approval holder shall report to the Director the results of the landfill operations monitoring as required in TABLE 4.6-D.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

TABLE 4.6-D: LANDFILL OPERATIONS MONITORING AND REPORTING REQUIREMENTS

MONITORING AND REPORTING				
Parameter	**Frequency**	**Sample Type**	**Sampling Location**	**Reporting**
Quantity and type of waste received	Continuously, When operating	Measured or estimated	At entrance to landfill	Annual Landfill Operations Report
Quantity and type of material removed	Continuously, when operating	Measured or estimated	At entrance to landfill	
General location of waste deposited	Continuously, when operating	As per survey, or using grid system	At active landfill area, or survey coordinates	
Leachate head	at least: - once every three working days; - after storm event; and - immediately prior to leachate removal	Calculated	At primary leachate collection system sumps for existing landfill Cell 1	
		Measured	At primary leachate collection system sumps for all other landfill cells	
Leachate analysis, as per TABLE 4.4-A	At least once every quarter year, unless insufficient sample volume is available	Grab sample	At each primary leachate collection system sump	
Volume of leachate removed from the leachate collection system	As removed	Measured or calculated	At leachate collection system sumps	
Leak detection liquid analysis, as per TABLE 4.4-A	At least once every quarter year, unless insufficient sample volume is available	Grab sample	At each leak detection system sump	
Volume of leak detection liquid removed from the leak detection system	At least once every working day, as removed	Measured or calculated	At leak detection system sumps	
Final cover	When final cover is applied	Final cover by survey cores or test pits or both	On each completed landfill cell	

4.6.58 The Annual Landfill Operations Report required in TABLE 4.6-D shall include, at a minimum, all of the following:

(a) the name and contact information of the person responsible for the facility;

(b) a summary of all information collected as required in TABLE 4.6-D;

(c) a summary of the results of any audit conducted in accordance with 4.1.7;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(d) a summary of the operations of the waste stabilization area;

(e) a summary of the performance of the run-on and runoff control systems, including a comparison to the limits in TABLES 4.3-B and 4.3-C;

(f) a summary of the performance of the leachate collection system, including a comparison to the maximum acceptable leachate head;

(g) a summary of the performance of the leak detection system, including a comparison to the action leakage rate limit;

(h) the Response Action Plan for the leak detection system pursuant to 4.4.10;

(i) the Annual Dugout and Water Well Sampling Program Report pursuant to 4.5.4;

(j) a summary of all revisions to the Landfill Operations Plan pursuant to 4.6.33(b);

(k) any groundwater remedial action taken pursuant to 4.6.34(p);

(l) a summary of records of landfill inspections pursuant to 4.6.53;

(m) a summary of:

  (i) operational issues encountered,

  (ii) emergencies occurred, and

  (iii) measures or actions taken;

(n) a summary of records of:

  (i) public complaints, and

  (ii) the approval holder's responses;

(o) an up-to-date financial security estimate pursuant to 5.1.2;

(p) an updated site development plan showing the status of the landfill progression at the end of the operating year, including but not limited to:

  (i) contour mapping,

  (ii) the location of active and inactive disposal areas,

  (iii) areas where a final cover has been placed, and

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(iv) the location of new landfill cell(s) constructed;

(q) the Annual Landfill Cell Closure Report pursuant to 7.1.7;

(r) a summary of contraventions reported pursuant to 2.1.1 related to landfill operations; and

(s) any other information as required in writing by the Director.

4.6.59 The approval holder shall submit the Annual Landfill Operations Report to the Director.

SECTION 4.7: DOMESTIC WASTEWATER

OPERATIONS

4.7.1 The approval holder shall not release any substances from the domestic wastewater system to the surrounding watershed except as authorized by this approval.

4.7.2 The approval holder shall direct all domestic wastewater to the domestic wastewater system.

4.7.3 The approval holder shall only dispose of substances from the domestic wastewater system:

(a) to facilities holding a current Act authorization;

(b) to facilities approved by a local environmental authority outside of Alberta; or

(c) as otherwise authorized in writing by the Director.

SECTION 4.8: WATERWORKS

Not used at this time.

SECTION 4.9: GROUNDWATER

MONITORING

4.9.1 The approval holder shall continue to implement the existing Groundwater Monitoring Program as authorized in writing by the Director, unless and until otherwise authorized in writing by the Director pursuant to 4.9.4.

4.9.2 The approval holder shall submit a revised Groundwater Monitoring Program to the Director on or before September 30, 2017, unless otherwise authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.9.3 If the revised Groundwater Monitoring Program submitted pursuant to 4.9.2 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

4.9.4 The approval holder shall implement the revised Groundwater Monitoring Program submitted pursuant to 4.9.2 as authorized in writing by the Director within the timeline specified in writing by the Director.

4.9.5 The approval holder shall:

(a) collect a representative groundwater sample from each of the groundwater monitor wells specified in the Groundwater Monitoring Program, including the groundwater monitoring wells designated as points of compliance; and

(b) analyze each sample for the parameters listed in TABLE 4.9-A.

TABLE 4.9-A: GROUNDWATER MONITORING PROGRAM

PARAMETERS	
pH	Metals
Electrical conductivity	Major ions
COD	Nutrients
DOC	BTEX
TDS	Petroleum Hydrocarbons Fractions F1 and F2

4.9.6 The monitoring required in 4.9.5 shall be conducted at the following frequencies, unless otherwise authorized in writing by the Director:

(a) a minimum of once per year during each of the active landfill life, landfill cell closure, final landfill closure, and post-closure periods; and

(b) a minimum of four times per year following detection of leachate constituents in groundwater at levels above those specified in 4.9.7, and until the levels specified in 4.9.7 have been met.

4.9.7 The groundwater quality in the monitoring wells, designated as points of compliance in the Groundwater Monitoring Program, shall not exceed the higher of:

(a) the objectives established in the water quality objectives in the *Canadian Environmental Quality Guidelines (CEQG)* for drinking water published by the Canadian Council of Ministers of the Environment (CCME), as amended; or

(b) background groundwater chemistry as determined through a statistical analysis, as a derived alternate groundwater performance standard.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.9.8 The approval holder shall implement the Remediation Plan as specified in the Landfill Operations Plan, when groundwater quality exceeds the groundwater performance criteria in 4.9.7.

4.9.9 The samples extracted from the groundwater monitor wells shall be collected using scientifically acceptable purging, sampling and preservation procedures so that a representative groundwater sample is obtained.

4.9.10 The approval holder shall:

(a) protect from damage; and

(b) keep locked except when being sampled

all groundwater monitoring wells unless otherwise authorized in writing by the Director.

4.9.11 If a representative groundwater sample cannot be collected because the groundwater monitoring well is damaged or is no longer capable of producing a representative groundwater sample, the approval holder shall:

(a) clean, repair or replace the groundwater monitoring well; and

(b) collect and analyse a representative groundwater sample prior to the next scheduled sampling event;

unless otherwise authorized in writing by the Director.

4.9.12 In addition to the sampling information recorded in 2.2.1, the approval holder shall record the following sampling information for all groundwater samples collected:

(a) a description of purging and sampling procedures;

(b) the static elevations above sea level, and depth below ground surface of fluid phases in the groundwater monitoring well prior to purging;

(c) the temperature of each sample at the time of sampling;

(d) the pH of each sample at the time of sampling; and

(e) the specific conductance of each sample at the time of sampling.

4.9.13 The approval holder shall carry out remediation of the groundwater in accordance with the following:

(a) *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended; and

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(b) *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended.

REPORTING

4.9.14 The approval holder shall compile an Annual Groundwater Monitoring Program Report which shall include, at a minimum, all of the following information:

(a) a completed *Record of Site Condition Form*, Alberta Environment, 2009, as amended;

(b) a legal land description of the facility and a map illustrating the facility boundaries;

(c) a topographic map of the facility;

(d) a description of the industrial activity and processes;

(e) a map showing the location of all surface and groundwater users, and a listing describing surface water and water well use details, within at least a 1.6 kilometre radius of the facility;

(f) a general hydrogeological characterization of the region within a five kilometre radius of the facility;

(g) a detailed hydrogeological characterization of the facility, including an interpretation of groundwater flow patterns;

(h) cross-sections showing depth to water table, patterns of groundwater movement and hydraulic gradients at the facility;

(i) borehole logs and completion details for groundwater monitoring wells;

(j) a map showing locations of all known buried channels within at least five kilometre of the facility;

(k) a map of surface drainage within the facility and surrounding area to include nearby water bodies;

(l) a map of groundwater monitoring well locations and a table summarizing the existing groundwater monitoring program for the facility;

(m) a summary of any changes to the groundwater monitoring program made since the last groundwater monitoring report;

(n) analytical data recorded as required in 4.9.5 and 4.9.11(b);

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(o) a summary of fluid elevations recorded as required in 4.9.12(b) and an interpretation of changes in fluid elevations;

(p) an interpretation of QA/QC program results;

(q) an interpretation of all the data in this report, including the following:

  (i) diagrams indicating the location and extent of any contamination,

  (ii) a description of probable sources of contamination, and

  (iii) a site map showing the location and type of current and historical potential sources of groundwater contamination;

(r) a summary and interpretation of the data collected since the groundwater monitoring program began including:

  (i) control charts which indicate trends in concentrations of parameters, and

  (ii) the migration of contaminants;

(s) a description of the following:

  (i) contaminated groundwater remediation techniques employed,

  (ii) source elimination measures employed,

  (iii) risk assessment studies undertaken, and

  (iv) risk management studies undertaken;

(t) a proposed sampling schedule for the following year(s);

(u) a description of any contaminant remediation, risk assessment or risk management action conducted at the facility; and

(v) recommendations for:

  (i) changes to the groundwater monitoring program to make it more effective, and

  (ii) remediation, risk assessment or risk management of contamination identified.

4.9.15 The approval holder shall submit the Annual Groundwater Monitoring Program Report to the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.9.16 If the Annual Groundwater Monitoring Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, within the timeline specified in writing by the Director.

SECTION 4.10: SOIL

4.10.1 In addition to any other requirements specified in this approval, the approval holder shall conduct all of the following activities related to soil monitoring and soil management required by this approval in accordance with the *Soil Monitoring Directive,* Alberta Environment, 2009, as amended:

(a) designing and developing proposals for the Soil Monitoring Program;

(b) designing and developing proposals for the Soil Management Program;

(c) all other actions, including sampling, analysing, and reporting, associated with the Soil Monitoring Program; and

(d) all other actions, including sampling, analysing and reporting, associated with the Soil Management Program.

MONITORING AND REPORTING

4.10.2 The approval holder shall submit the Soil Monitoring Program proposal to the Director according to the following schedule:

(a) for the first soil monitoring event on or before January 31, 2019; and

(b) for the second soil monitoring event on or before January 31, 2024;

unless otherwise authorized in writing by the Director.

4.10.3 If any Soil Monitoring Program proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

4.10.4 Subject to 4.10.3, the approval holder shall implement the Soil Monitoring Program as authorized in writing by the Director.

4.10.5 If an authorization or a deficiency letter is not issued within 120 days of the applicable date required by 4.10.2, the approval holder shall implement the Soil Monitoring Program:

(a) in accordance with the program as set out in the proposal submitted by the approval holder; and

(b) within 270 days after the applicable date required by 4.10.2.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.10.6 The approval holder shall submit to the Director each Soil Monitoring Program Report obtained from the soil monitoring referred to in 4.10.4 and 4.10.5 according to the following schedule:

(a) for the first Soil Monitoring Program Report on or before January 31, 2020; and

(b) for the second Soil Monitoring Program Report on or before January 31, 2025;

unless otherwise authorized in writing by the Director.

4.10.7 If any Soil Monitoring Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

SOIL MANAGEMENT PROGRAM

4.10.8 If the Soil Monitoring Program, or any other soil monitoring, reveals that there are substances present in the soil at concentrations greater than any of the applicable concentrations set out in the standards in the *Soil Monitoring Directive*, Alberta Environment, 2009, as amended, the approval holder shall develop a Soil Management Program Proposal.

4.10.9 If a Soil Management Program Proposal is required pursuant to 4.10.8, the approval holder shall submit a Soil Management Program Proposal to the Director according to the following schedule:

(a) for Soil Management Program Proposal that is triggered by the findings from the first soil monitoring event on or before the date in 4.10.6(a);

(b) for Soil Management Program Proposal that is triggered by the findings from a second soil monitoring event on or before the date in 4.10.6(b); or

(c) for any other soil monitoring event not specified in this approval within six months of completion of the soil monitoring event.

4.10.10 If any Soil Management Program Proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

4.10.11 The approval holder shall implement the Soil Management Program as authorized in writing by the Director.

4.10.12 If the approval holder is required to implement a Soil Management Program pursuant to 4.10.11, the approval holder shall submit a written Soil Management Program

TERMS AND CONDITIONS ATTACHED TO APPROVAL

Report to the Director on or before March 31 of each year following the year in which the information was collected.

4.10.13 If any Soil Management Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified by the Director by the date specified in writing by the Director.

PART 5: FINANCIAL SECURITY REQUIREMENTS

5.1.1 The approval holder shall annually review and revise the cost estimate for reclamation of the facility including decommissioning and land reclamation.

5.1.2 The annual revised cost estimate for the facility shall be submitted to the Director by March 31 of each year.

5.1.3 The approval holder shall review and revise the cost estimate for reclamation of the facility when one or more of the following occurs:

(a) the cost estimate of future conservation and reclamation of the facility changes;

(b) the extent of the operation of the facility is increased or reduced;

(c) the facility or any portion of it is conserved and reclaimed;

(d) the conservation and reclamation plan required by this approval is changed; or

(e) the activities conducted at the facility for which security is required is increased or decreased.

5.1.4 The approval holder shall submit the revised cost estimate arising from 5.1.3 to the Director within 30 days after the occurrence of any of the circumstances described in 5.1.3.

5.1.5 The approval holder shall provide additional financial security as required in writing by the Director.

5.1.6 The approval holder shall renew the financial security for the facility at least 30 days prior to the date it expires.

5.1.7 The approval holder shall maintain the financial security for the facility until returned in accordance with the Act or the regulations.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

PART 6: DECOMMISSIONING AND LAND RECLAMATION OF HWRSP FACILITY

SECTION 6.1: GENERAL

6.1.1 The approval holder shall apply for an amendment to this approval to reclaim the HWRSP Facility by submitting to the Director:

(a) a Decommissioning Plan; and

(b) a Land Reclamation Plan.

6.1.2 The approval holder shall submit the:

(a) Decommissioning Plan; and

(b) Land Reclamation Plan

referred to in 6.1.1 within six (6) months of the HWRSP Facility ceasing operation, except for repairs and maintenance, unless otherwise authorized in writing by the Director.

SECTION 6.2: DECOMMISSIONING

6.2.1 The Decommissioning Plan referred to in 6.1.1 shall include, at a minimum, all of the following:

(a) a plan for dismantling the HWRSP Facility;

(b) a comprehensive study to determine the nature, degree and extent of contamination at the HWRSP Facility and affected lands;

(c) a plan to manage all wastes at the HWRSP Facility;

(d) evaluation of remediation technologies proposed to be used at the HWRSP Facility and affected lands;

(e) a plan for decontamination of the HWRSP Facility and affected lands in accordance with the following:

(i) for soil or groundwater, *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,

(ii) for soil or groundwater, *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(iii) for drinking water, *Canadian Environmental Quality Guidelines*, Canadian Council of Ministers of the Environment, PN 1299, 1999, as amended, and

(iv) for surface water, *Surface Water Quality Guidelines for Use in Alberta*, Alberta Environment, November 1999, as amended;

(f) confirmatory testing to indicate compliance with the remediation objectives;

(g) a plan for maintaining and operating contaminant monitoring systems;

(h) a schedule for activities (a) through (g) above; and

(i) any other information as required in writing by the Director.

6.2.2 If the Decommissioning Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

SECTION 6.3: LAND RECLAMATION

6.3.1 The Land Reclamation Plan referred to in 6.1.1 shall include, at a minimum, all of the following:

(a) the final use of the reclaimed area and how equivalent land capability will be achieved;

(b) removal of infrastructure;

(c) restoration of drainage;

(d) soil replacement;

(e) erosion control;

(f) revegetation and conditioning of the HWRSP Facility including:

(i) species list, seed source and quality, seeding rates and methods,

(ii) fertilization rates and methods, and

(iii) wildlife habitat plans where applicable;

(g) reclamation schedule; and

(h) any other information as required in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

6.3.2 If the Land Reclamation Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

PART 7: FINAL LANDFILL CLOSURE AND POST-CLOSURE

SECTION 7.1: LANDFILL CELL CLOSURE AND MAINTENANCE

7.1.1 The approval holder shall submit a Landfill Cell Closure Plan for individual landfill cell closure to the Director on or before September 30, 2017, unless otherwise authorized in writing by the Director.

7.1.2 The Landfill Cell Closure Plan submitted pursuant to 7.1.1 shall be signed and stamped by a professional registered with APEGA.

7.1.3 If the Landfill Cell Closure Plan submitted pursuant to 7.1.1 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

7.1.4 The approval holder shall implement the Landfill Cell Closure Plan submitted pursuant to 7.1.1 as authorized in writing by the Director.

7.1.5 The approval holder shall maintain the closed landfill cells to:

(a) protect and maintain the integrity of the final cover and surface water drainage systems;

(b) prevent erosion;

(c) prevent surface water ponding;

(d) remediate areas affected by subsidence and differential settlement; and

(e) prevent leachate break out.

7.1.6 If the approval holder completes landfill cell closure in a year, the approval holder shall prepare an Annual Landfill Cell Closure Report, and include, at a minimum, all of the following information in the Report:

(a) as-built plans and details on the location of landfill cells that have been closed;

(b) certified construction QA/QC procedures employed during cover construction and installation; and

(c) survey reports showing the final cover depths.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

7.1.7 The approval holder shall submit the Annual Landfill Cell Closure Report with the Annual Landfill Operations Report required in 4.6.58.

SECTION 7.2: FINAL LANDFILL CLOSURE AND POST-CLOSURE

7.2.1 The approval holder shall apply for an amendment to this approval for final landfill closure by submitting to the Director:

(a) a Detailed Final Landfill Closure Plan ; and

(b) a Landfill Post-Closure Plan.

7.2.2 The approval holder shall submit the:

(a) Detailed Final Landfill Closure Plan; and

(b) Landfill Post-Closure Plan

referred to in 7.2.1 within six (6) months of the landfill ceasing operations, unless otherwise authorized in writing by the Director.

DETAILED FINAL LANDFILL CLOSURE PLAN

7.2.3 The Detailed Final Landfill Closure Plan shall be developed in accordance with sections 6.1(b) and 6.1(c) of the *Standards for Landfills in Alberta*, as amended.

7.2.4 In addition to 7.2.3, the Detailed Final Landfill Closure Plan shall include, at a minimum, all of the following:

(a) a plan for replacement of soil;

(b) a QA/QC Program; and

(c) any deviations from the most recently submitted closure plan.

7.2.5 The Detailed Final Landfill Closure Plan shall be signed and stamped by a professional registered with APEGA.

7.2.6 If the Detailed Final Landfill Closure Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

7.2.7 The approval holder shall implement the Detailed Final Landfill Closure Plan as authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

LANDFILL POST-CLOSURE PLAN

7.2.8 The Landfill Post-Closure Plan shall be developed in accordance with sections 6.2 and 6.3 of the *Standards for Landfills in Alberta*, as amended.

7.2.9 In addition to 7.2.8, the Landfill Post-Closure Plan shall include, at a minimum, all of the following:

(a) the groundwater monitoring program including performance standards and points of compliance;

(b) the subsurface landfill gas monitoring program and performance standards at points of compliance;

(c) a plan for erosion control;

(d) a plan for maintaining vegetative cover; and

(e) any other information requested in writing by the Director.

7.2.10 The Landfill Post-Closure Plan shall be signed and stamped by a professional registered with APEGA.

7.2.11 If the Landfill Post-Closure Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

7.2.12 The approval holder shall implement the Landfill Post-Closure Plan as authorized in writing by the Director.

PART 8: DECOMMISSIONING AND LAND RECLAMATION OF OLD SURFACE WATER DETENTION POND

8.1.1 The approval holder shall:

(a) decommission; and

(b) reclaim

the old surface water detention pond prior to construction of Cell 4.

8.1.2 The approval holder shall submit a Decommissioning and Land Reclamation Plan for the old surface water detention pond to the Director a minimum of six (6) months prior to decommissioning and land reclamation of the pond.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

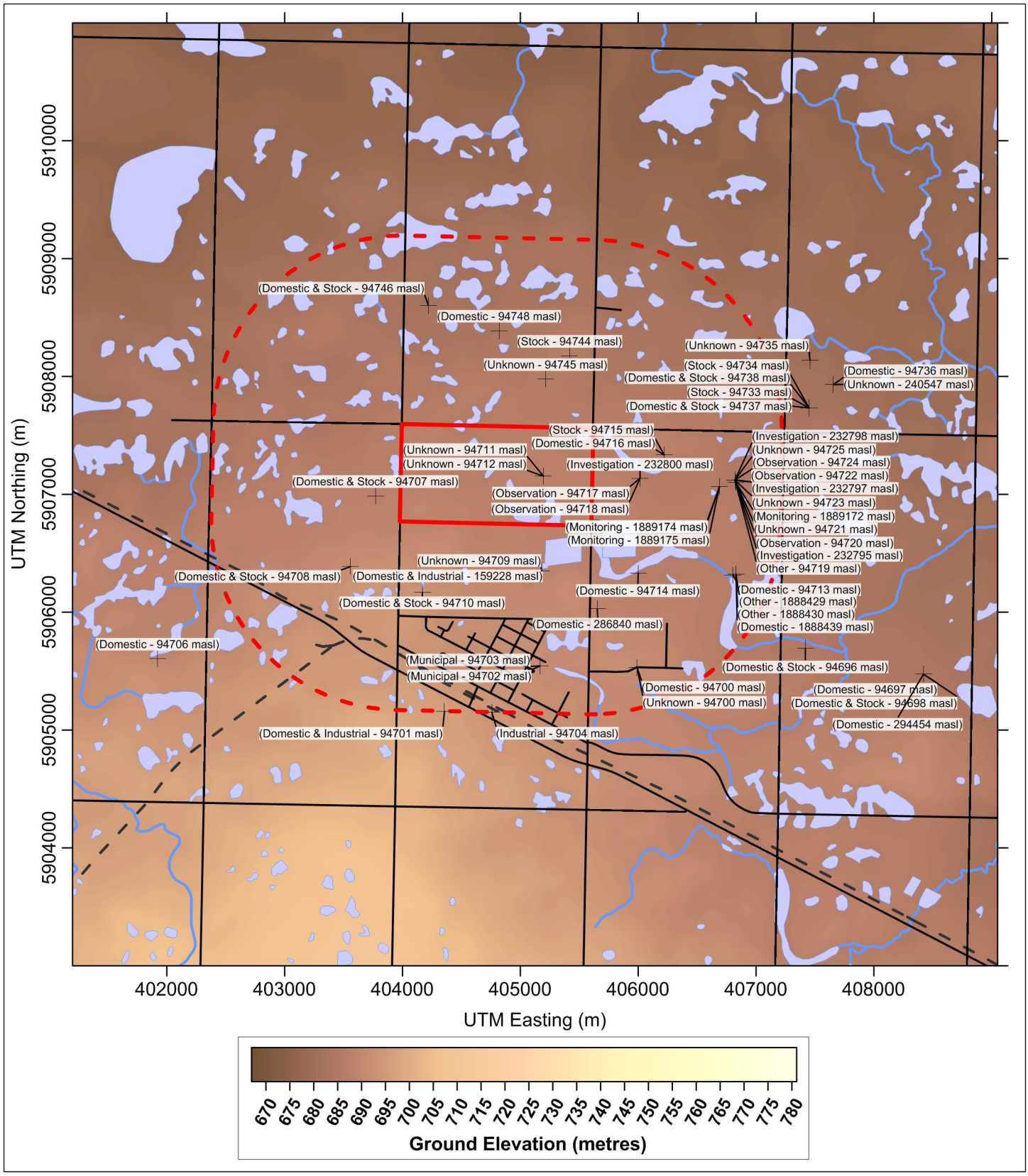
8.1.3 If the Decommissioning and Land Reclamation Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

DATED March 31, 2017

DESIGNATED DIRECTOR UNDER THE ACT
Mohammad Habib, P. Eng.

APPENDIX B

WATER WELL AND SURFACE WATER SEARCH RESULTS



LEGEND

- Water Well (Use - Well ID)
- Approximate Site (N1/2 9-50-17 W4M)
- Search Radius
- Road
- Rail
- Waterbody
- Watercourse

UTM ZONE 12
NAD 83 DATUM

CLIENT

CleanHarbors

TETRA TECH

2017 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Alberta Water Well Information Database 2.0 km Search Radius

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03652-01	CF	BS	AS	000

OFFICE	DATE	STATUS
EBA-CALGARY	July, 2017	Issued for Use

Appendix B

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Reconnaissance Report

View in Imperial

Export to Excel

Groundwater Wells

Please click the water Well ID to generate the Water Well Drilling Report.

Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (m)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (m)	TEST RATE (L/min)	SC_DIAM (cm)
94700	NW	3	50	17	4	UNKNOWN DRILLER		106.68	Chemistry	Domestic				MIZERA, RUDY	45.72		0.00
94700	NW	3	50	17	4	HOLLAND WATER WELLS		106.68	Old Well - Abandoned	Unknown		1		BEAVER COUNTY			
94701	WH	04	050	17	4	MERV'S WATER WELL DRILLING	1986-05-01	120.40	New Well	Domestic & Industrial		13		ABRAHAM, JOE	24.38	11.37	13.97
94702	NE	4	50	17	4	UNKNOWN DRILLER		15.24	Chemistry	Municipal	2			RYLEY, VILL OF			
94703	NE	4	50	17	4	UNKNOWN DRILLER		60.96	Chemistry	Municipal	1			RYLEY, VILL OF			
94704	00	04	050	17	4	ALF'S DRILLING & SUPPLIES LTD.	1986-10-02	132.59	New Well	Industrial		9		ANDRUKOW FARM SALES LTD	21.95	272.77	14.12
94707	09	08	050	17	4	UNKNOWN DRILLER	1930-01-01	4.27	Federal Well Survey	Domestic & Stock				MAGNUSSEN			0.00
94708	SE	08	050	17	4	UNKNOWN DRILLER		121.92	Federal Well Survey	Domestic & Stock							0.00
94709	SE	09	050	17	4	UNKNOWN DRILLER		7.32	Chemistry	Unknown				MAGNUSSEN, E.	3.05		0.00
94710	04	09	050	17	4	UNKNOWN DRILLER		4.27	Federal Well Survey	Domestic & Stock				HOSTLUND			0.00
94711	NE	09	050	17	4	BIG QUILL DRILLING LTD.	1983-01-31	90.53	Test Hole-Abandoned	Unknown		13		C.E. MOELL CONSULTING LTD#1	0.00	13.64	17.78
94712	NE	09	050	17	4	BIG QUILL DRILLING LTD.	1983-02-01	90.53	Test Hole-Abandoned	Unknown		13		C.E. MOELL CONSULTING LTD#2	0.00	18.18	17.78
94713	SE	10	050	17	4	UNKNOWN DRILLER	1915-01-01	7.01	Federal Well Survey	Domestic				MASTERS, J.E.	3.96		0.00
94714	SW	10	050	17	4	UNKNOWN DRILLER		67.06	Chemistry	Domestic				GARSTAD, MARK	48.77		0.00
94715	14	10	050	17	4	UNKNOWN DRILLER	1919-01-01	91.44	Federal Well Survey	Stock				MCDONAGH, W.N.			5.08
94716	14	10	050	17	4	UNKNOWN DRILLER	1912-01-01	6.10	Federal Well Survey	Domestic				MCDONAGH, W.N.			0.00
94717	NW	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	29.87	Piezometer	Observation		5		ALTA ENV #2143E			0.00
94718	NW	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	42.37	Piezometer	Observation		7		ALTA ENV #2144E			0.00
94719	NE	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	4.57	Test Hole	Other		3		ALTA ENV #2133E			0.00
94720	NE	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-26	14.94	Piezometer	Observation		4		ALTA ENV #2140E			0.00

Reconnaissance Report

View in Imperial

Export to Excel

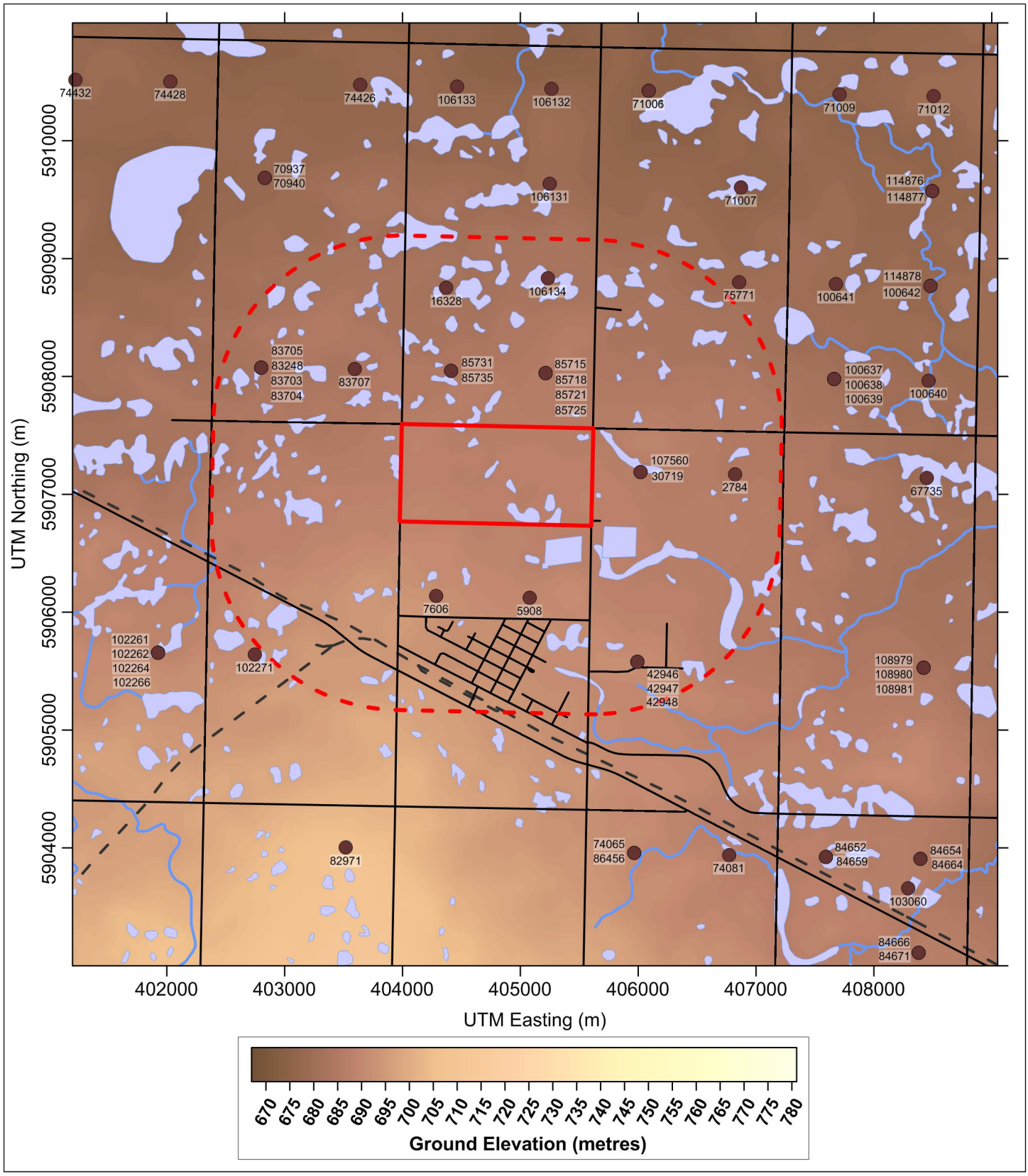
Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (m)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (m)	TEST RATE (L/min)	SC_DIAM (cm)
94721	NE	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-26	15.24	Test Hole	Unknown		4		ALTA ENV #2137E			0.00
94722	NE	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-26	26.21	Piezometer	Observation		4		ALTA ENV #2141E			0.00
94723	NE	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-31	14.63	Test Hole	Unknown		3		ALTA ENV #2139E			5.08
94724	NE	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-31	25.30	Piezometer	Observation		5		ALTA ENV #2138E			5.08
94725	NE	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-28	29.87	Test Hole	Unknown		6		ALTA ENV #2136E			5.08
94744	08	16	050	17	4	UNKNOWN DRILLER	1929-01-01	123.44	Federal Well Survey	Stock				NICHOLS	21.34		15.24
94745	SE	16	050	17	4	UNKNOWN DRILLER	1920-01-01	7.62	Federal Well Survey	Unknown				NICHOLS			0.00
94748	00	16	050	17	4	UNKNOWN DRILLER		45.72	Chemistry	Domestic				BROOKS, ROBERT	3.05		0.00
159228	SE	9	50	17	4	LAKELAND DRILLING LTD.	1991-09-07	140.21	New Well	Domestic & Industrial		11		LAIDLAW ENVIRONMENTAL SVC LTD	18.59	45.46	12.70
232795	NE	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	91.44	Test Hole	Investigation		13		ALTA ENV #2132E			0.00
232797	NE	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	60.96	Test Hole	Investigation		14		ALTA ENV #2134E			0.00
232798	NE	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-28	60.96	Test Hole	Investigation		13		ALTA ENV #2135E			0.00
232800	NW	10	050	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	60.35	Test Hole	Investigation		10		ALTA ENV #2142			0.00
286840	04	10	050	17	4	LOSNESS DRILLING (1975) LTD.	1997-05-14	82.30	New Well	Domestic		11	25	PEPPES, RONALD	9.30	18.18	0.00
1888429	SE	10	50	17	4	HILL DRILLING LTD.	2004-04-16	48.77	Test Hole	Other		8		C. E. MODELL & ASSOC. LTD			12.70
1888430	SE	10	050	17	4	HILL DRILLING LTD.	2004-04-15	48.77	Test Hole	Other		11		C. E. MOELLL & ASSOC. LLTD			12.70
1888439	SE	10	050	17	4	HILL DRILLING LTD.	2004-04-13	46.33	New Well	Domestic		7	19	C.E. MOELL & ASSOCIATES LTD.		0.00	12.70
1889172	9	10	50	17	4	HILL DRILLING LTD.	2013-05-21	36.88	Piezometer	Monitoring		1		BEAVER MUNICIPAL SOLUTIONS			
1889173	10	10	50	17	4	HILL DRILLING LTD.	2013-05-21	5.49	Piezometer	Monitoring		1		BEAVER MUNICIPAL SOLUTIONS			
1889174	10	10	50	17	4	HILL DRILLING LTD.	2013-05-22	10.06	Piezometer	Monitoring		1		BEAVER MUNICIPAL SOLUTIONS			

Reconnaissance Report

View in Imperial

Export to Excel

Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (m)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (m)	TEST RATE (L/min)	SC_DIAM (cm)
1889175	10	10	50	17	4	HILL DRILLING LTD.	2013-05-22	21.34	Piezometer	Monitoring		1		BEAVER MUNICIPAL SOLUTIONS			



LEGEND

- Surface water user (WA ID)
- Approximate Site (N1/2 9-50-17 W4M)
- Search Radius
- Road
- Rail
- Waterbody
- Watercourse

UTM ZONE 12
NAD 83 DATUM

CLIENT

CleanHarbors

TETRA TECH

2017 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Alberta Surface Water Users 2.0 km Search Radius

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03652-01	CF	BS	AS	000

OFFICE	DATE	STATUS
EBA-CALGARY	July, 2017	Issued for Use

Appendix B

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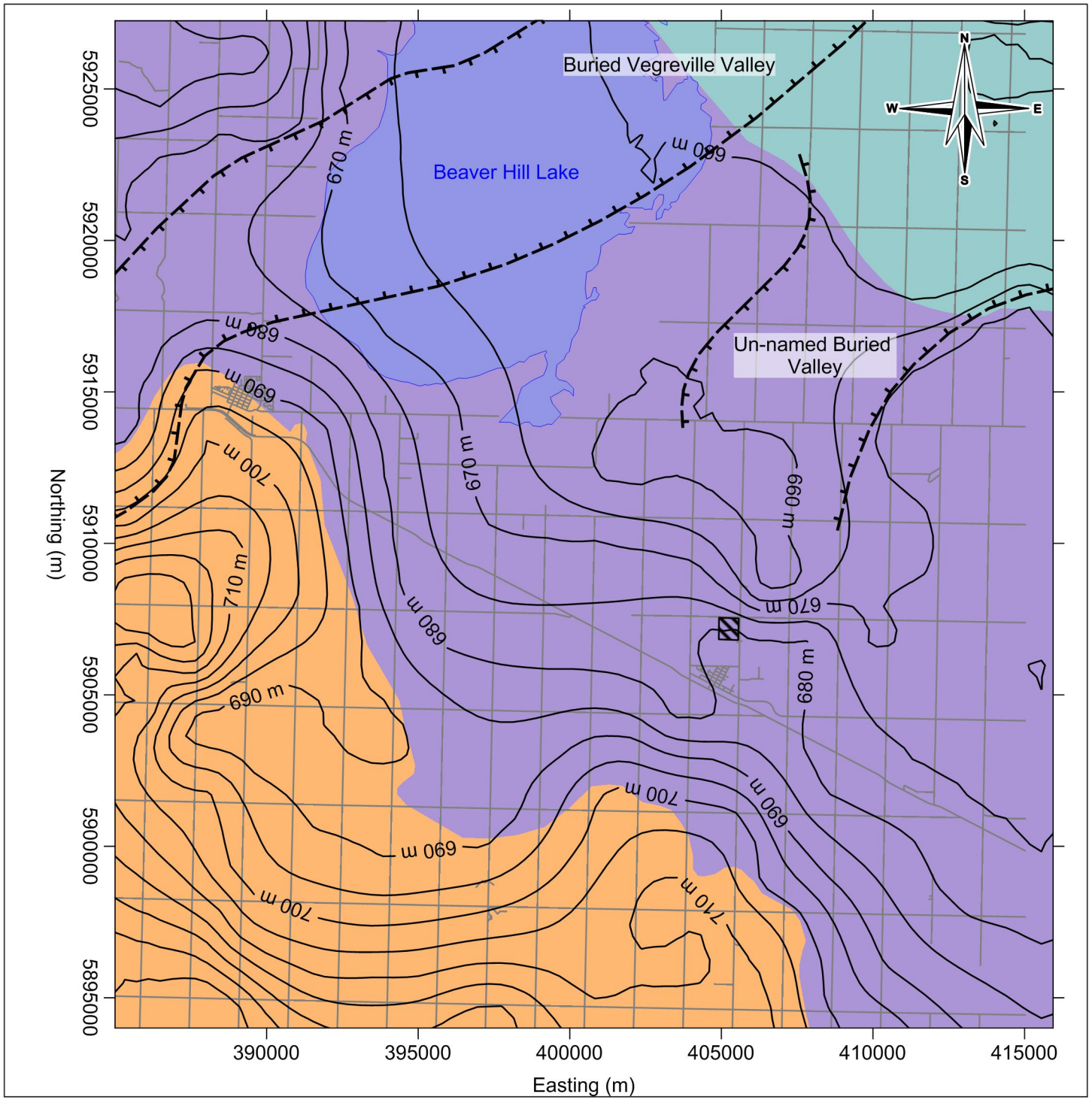
APPROVAL ID	APPROVAL NAME	EFFECTIVE DATE	WA ID	SOURCE	QUANTITY (m3)	CONSUMPTIVE (m3)	LOSSES (m3)	QUA	SEC	TWP	RNG	MER	WSC	RIVER SUB BASIN NAME	APPROVAL HOLDER
00022220-00-00	COUNTY OF BEAVER, WR, 51502	06-Oct-1993	220	Beaverhill Lake (051 & 052-17 & 18-W4)	0	0	0	SW	25	50	18	4	05EB	COOKING/BEAVERHILL LAKE	BEAVER COUNTY
00024404-00-00	BEAVER REG WASTE MGT SVCS, WR, 26835	30-Aug-1996	2784	Beaverhill Lake (051 & 052-17 & 18-W4)	9,860	1,230	8,630	NE	10	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BEAVER REGIONAL WASTE MANAGEMENT SERVICES COMMISSION
00026794-00-00	LAIDLAW ENVIRONMENTAL SERVICE, WR, 24753	09-Mar-1992	5908	Beaverhill Lake (051 & 052-17 & 18-W4)	0	0	0	SE	9	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LAIDLAW ENVIRONMENTAL SERVICES LTD.
00028088-00-00	MAGNESON, WR, 23378	30-Sep-1991	7606	Beaverhill Lake (051 & 052-17 & 18-W4)	6,160	4,930	1,230	SW	9	50	17	4	05EB	COOKING/BEAVERHILL LAKE	STIER, PAT
00035644-00-00	COUNTY OF BEAVER, WR, 14772	04-Feb-1982	16328	North Saskatchewan River	0	0	0	NW	16	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BEAVER COUNTY
00035759-00-00	HOLDEN/WETLAND/DUL (HARLE PROJECT) - F14596	07-Jan-1985	16458	Beaverhill Lake (051 & 052-17 & 18-W4)	55,510	0	55,510	SW	35	49	17	4	05EB	COOKING/BEAVERHILL LAKE	JOHN & CATHERINE JENSEN
00040318-00-00	RYLEY/CROP/JENSEN JOHN - F09427	21-Nov-1980	103060	Beaverhill Lake (051 & 052-17 & 18-W4)	74,010	74,010	0	NE	35	49	17	4	05EB	COOKING/BEAVERHILL LAKE	JENSEN, JOHN
00067670-00-00	RYLEY/DIVERSION/BRWMSC	28-Jul-1998	107560	Unnamed Lake - Noncontributing	57,000	57,000	0	NW	10	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BEAVER REGIONAL WASTE MANAGEMENT SERVICES COMMISSION
00072398-00-00	RYLEY/PARK/BRWMSC - F85381	21-Oct-1998	30719	Beaverhill Lake (051 & 052-17 & 18-W4)	18,000	15,000	3,000	NW	10	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BEAVER REGIONAL WASTE MANAGEMENT SERVICES COMMISSION
00143517-00-00	RYLEY/REGISTRATION/RUDY & GERTIE MIZERA	28-Jan-2002	42946	Unnamed Aquifer - Unclassified	280	280	0	NW	3	50	17	4	05EB	COOKING/BEAVERHILL LAKE	RUDY & GERTIE MIZERA
00143517-00-00	RYLEY/REGISTRATION/RUDY & GERTIE MIZERA	28-Jan-2002	42947	Surface Runoff	285	285	0	NW	3	50	17	4	05EB	COOKING/BEAVERHILL LAKE	RUDY & GERTIE MIZERA
00143517-00-00	RYLEY/REGISTRATION/RUDY & GERTIE MIZERA	28-Jan-2002	42948	Surface Runoff	285	285	0	NW	3	50	17	4	05EB	COOKING/BEAVERHILL LAKE	RUDY & GERTIE MIZERA
00150710-00-00	RYLEY/REGISTRATION/HELGELAND SIGNAR - F00150710	13-Jun-2002	102261	Unnamed Aquifer - Unclassified	402	402	0	NE	6	50	17	4	05EB	COOKING/BEAVERHILL LAKE	HELGELAND, SIGNAR
00150710-00-00	RYLEY/REGISTRATION/HELGELAND SIGNAR - F00150710	13-Jun-2002	102262	Unnamed Aquifer - Unclassified	134	134	0	NE	6	50	17	4	05EB	COOKING/BEAVERHILL LAKE	HELGELAND, SIGNAR
00150710-00-00	RYLEY/REGISTRATION/HELGELAND SIGNAR - F00150710	13-Jun-2002	102264	Unnamed Stream - Unclassified	242	242	0	NE	6	50	17	4	05EB	COOKING/BEAVERHILL LAKE	HELGELAND, SIGNAR
00150710-00-00	RYLEY/REGISTRATION/HELGELAND SIGNAR - F00150710	13-Jun-2002	102266	Surface Runoff	241	241	0	NE	6	50	17	4	05EB	COOKING/BEAVERHILL LAKE	HELGELAND, SIGNAR
00150710-00-00	RYLEY/REGISTRATION/HELGELAND SIGNAR - F00150710	13-Jun-2002	102269	Surface Runoff	10	10	0	NW	6	50	17	4	05EB	COOKING/BEAVERHILL LAKE	HELGELAND, SIGNAR
00150710-00-00	RYLEY/REGISTRATION/HELGELAND SIGNAR - F00150710	13-Jun-2002	102271	Surface Runoff	11	11	0	NW	5	50	17	4	05EB	COOKING/BEAVERHILL LAKE	HELGELAND, SIGNAR
00155215-00-00	RYLEY/REGISTRATION/MIZERA TERRY - F00155215	19-Feb-2003	108979	Unnamed Aquifer - Unclassified	1,332	1,332	0	NE	2	50	17	4	05EB	COOKING/BEAVERHILL LAKE	MIZERA, TERRY
00155215-00-00	RYLEY/REGISTRATION/MIZERA TERRY - F00155215	19-Feb-2003	108980	Surface Runoff	83	83	0	NE	2	50	17	4	05EB	COOKING/BEAVERHILL LAKE	MIZERA, TERRY
00155215-00-00	RYLEY/REGISTRATION/MIZERA TERRY - F00155215	19-Feb-2003	108981	Surface Runoff	1,128	1,128	0	NE	2	50	17	4	05EB	COOKING/BEAVERHILL LAKE	MIZERA, TERRY
00155215-00-00	RYLEY/REGISTRATION/MIZERA TERRY - F00155215	19-Feb-2003	108982	Unnamed Stream - Unclassified	147	147	0	NE	1	50	17	4	05EB	COOKING/BEAVERHILL LAKE	MIZERA, TERRY
00168265-00-00	RYLEY/REGISTRATION/JOHN & CATHERINE JENSEN - F00168265	28-Mar-2002	84652	Surface Runoff	700	700	0	NW	35	49	17	4	05EB	COOKING/BEAVERHILL LAKE	JOHN & CATHERINE JENSEN
00168265-00-00	RYLEY/REGISTRATION/JOHN & CATHERINE JENSEN - F00168265	28-Mar-2002	84654	Unnamed Stream - Unclassified	142	142	0	NE	35	49	17	4	05EB	COOKING/BEAVERHILL LAKE	JOHN & CATHERINE JENSEN
00168265-00-00	RYLEY/REGISTRATION/JOHN & CATHERINE JENSEN - F00168265	28-Mar-2002	84659	Surface Runoff	228	228	0	NW	35	49	17	4	05EB	COOKING/BEAVERHILL LAKE	JOHN & CATHERINE JENSEN
00168265-00-00	RYLEY/REGISTRATION/JOHN & CATHERINE JENSEN - F00168265	28-Mar-2002	84664	Surface Runoff	142	142	0	NE	35	49	17	4	05EB	COOKING/BEAVERHILL LAKE	JOHN & CATHERINE JENSEN
00168265-00-00	RYLEY/REGISTRATION/JOHN & CATHERINE JENSEN - F00168265	28-Mar-2002	84666	Unnamed Stream - Unclassified	9	9	0	SE	35	49	17	4	05EB	COOKING/BEAVERHILL LAKE	JOHN & CATHERINE JENSEN
00168265-00-00	RYLEY/REGISTRATION/JOHN & CATHERINE JENSEN - F00168265	28-Mar-2002	84671	Surface Runoff	9	9	0	SE	35	49	17	4	05EB	COOKING/BEAVERHILL LAKE	JOHN & CATHERINE JENSEN
00168693-00-00	RYLEY/REGISTRATION/LEE & SHANNON HARTE - F00168693	26-Mar-2002	82971	Surface Runoff	1,605	1,605	0	NE	32	49	17	4	05EB	COOKING/BEAVERHILL LAKE	LEE & SHANNON HARTE
00168693-00-00	RYLEY/REGISTRATION/LEE & SHANNON HARTE - F00168693	26-Mar-2002	82972	Surface Runoff	250	250	0	NW	31	49	17	4	05EB	COOKING/BEAVERHILL LAKE	LEE & SHANNON HARTE
00168693-00-00	RYLEY/REGISTRATION/LEE & SHANNON HARTE - F00168693	26-Mar-2002	82974	Surface Runoff	250	250	0	NW	31	49	17	4	05EB	COOKING/BEAVERHILL LAKE	LEE & SHANNON HARTE
00169280-00-00	RYLEY/REGISTRATION/DENNIS W.WOOD - F00169280	20-Mar-2002	75771	Surface Runoff	430	430	0	NE	15	50	17	4	05EB	COOKING/BEAVERHILL LAKE	WOOD, DENNIS
00169478-00-00	TOFIELD/REGISTRATION/ROBERT, DOREEN & MIKE BONHAM - F00169478	14-Mar-2002	69338	Unnamed Aquifer - Unclassified	1,227	1,227	0	NW	13	50	18	4	05EB	COOKING/BEAVERHILL LAKE	ROBERT & DOREEN & MIKE BONHAM
00169478-00-00	TOFIELD/REGISTRATION/ROBERT, DOREEN & MIKE BONHAM - F00169478	14-Mar-2002	69339	Unnamed Stream - Unclassified	1,227	1,227	0	NW	13	50	18	4	05EB	COOKING/BEAVERHILL LAKE	ROBERT & DOREEN & MIKE BONHAM
00169478-00-00	TOFIELD/REGISTRATION/ROBERT, DOREEN & MIKE BONHAM - F00169478	14-Mar-2002	69340	Surface Runoff	1,295	1,295	0	SE	13	50	18	4	05EB	COOKING/BEAVERHILL LAKE	ROBERT & DOREEN & MIKE BONHAM
00169478-00-00	TOFIELD/REGISTRATION/ROBERT, DOREEN & MIKE BONHAM - F00169478	14-Mar-2002	69342	Unnamed Stream - Unclassified	336	336	0	SW	13	50	18	4	05EB	COOKING/BEAVERHILL LAKE	ROBERT & DOREEN & MIKE BONHAM
00169478-00-00	TOFIELD/REGISTRATION/ROBERT, DOREEN & MIKE BONHAM - F00169478	14-Mar-2002	69345	Surface Runoff	336	336	0	NE	12	50	18	4	05EB	COOKING/BEAVERHILL LAKE	ROBERT & DOREEN & MIKE BONHAM

APPROVAL ID	APPROVAL NAME	EFFECTIVE DATE	WA ID	SOURCE	QUANTITY (m3)	CONSUMPTIVE (m3)	LOSSES (m3)	QUA	SEC	TWP	RNG	MER	WSC	RIVER SUB BASIN NAME	APPROVAL HOLDER
00169478-00-00	TOFIELD/REGISTRATION/ROBERT, DOREEN & MIKE BONHAM - F00169478	14-Mar-2002	69349	Unnamed Stream - Unclassified	168	168	0	SE	31	50	17	4	05EB	COOKING/BEAVERHILL LAKE	ROBERT & DOREEN & MIKE BONHAM
00169478-00-00	TOFIELD/REGISTRATION/ROBERT, DOREEN & MIKE BONHAM - F00169478	14-Mar-2002	69351	Surface Runoff	168	168	0	SE	31	50	17	4	05EB	COOKING/BEAVERHILL LAKE	ROBERT & DOREEN & MIKE BONHAM
00169478-00-00	TOFIELD/REGISTRATION/ROBERT, DOREEN & MIKE BONHAM - F00169478	14-Mar-2002	69356	Unnamed Stream - Unclassified	168	168	0	SW	31	50	17	4	05EB	COOKING/BEAVERHILL LAKE	ROBERT & DOREEN & MIKE BONHAM
00169478-00-00	TOFIELD/REGISTRATION/ROBERT, DOREEN & MIKE BONHAM - F00169478	14-Mar-2002	69361	Surface Runoff	168	168	0	SW	31	50	17	4	05EB	COOKING/BEAVERHILL LAKE	ROBERT & DOREEN & MIKE BONHAM
00169478-00-00	TOFIELD/REGISTRATION/ROBERT, DOREEN & MIKE BONHAM - F00169478	14-Mar-2002	69366	Unnamed Stream - Unclassified	336	336	0	NW	35	50	17	4	05EB	COOKING/BEAVERHILL LAKE	ROBERT & DOREEN & MIKE BONHAM
00169478-00-00	TOFIELD/REGISTRATION/ROBERT, DOREEN & MIKE BONHAM - F00169478	14-Mar-2002	69367	Surface Runoff	336	336	0	SE	11	50	18	4	05EB	COOKING/BEAVERHILL LAKE	ROBERT & DOREEN & MIKE BONHAM
00173237-00-00	RYLEY/REGISTRATION/BRENT PHILLIPS - F00173237	15-Mar-2002	70937	Unnamed Stream - Unclassified	400	400	0	SW	20	50	17	4	05EB	COOKING/BEAVERHILL LAKE	PHILLIPS, BRENT
00173237-00-00	RYLEY/REGISTRATION/BRENT PHILLIPS - F00173237	15-Mar-2002	70940	Unnamed Stream - Unclassified	400	400	0	SW	20	50	17	4	05EB	COOKING/BEAVERHILL LAKE	PHILLIPS, BRENT
00173725-00-00	RYLEY/REGISTRATION/ARBON LEALA - F00173725	24-May-2002	96623	Unnamed Aquifer - Unclassified	78	78	0	SW	27	49	17	4	05EB	COOKING/BEAVERHILL LAKE	ARBON, LEALA
00173725-00-00	RYLEY/REGISTRATION/ARBON LEALA - F00173725	24-May-2002	96624	Surface Runoff	132	132	0	SW	27	49	17	4	05EB	COOKING/BEAVERHILL LAKE	ARBON, LEALA
00175254-00-00	RYLEY/REGISTRATION/CATHAY FARMS - F00175254	16-Jan-2003	106131	Surface Runoff	156	156	0	SE	21	50	17	4	05EB	COOKING/BEAVERHILL LAKE	CATHAY FARMS
00175254-00-00	RYLEY/REGISTRATION/CATHAY FARMS - F00175254	16-Jan-2003	106132	Surface Runoff	156	156	0	NE	21	50	17	4	05EB	COOKING/BEAVERHILL LAKE	CATHAY FARMS
00175254-00-00	RYLEY/REGISTRATION/CATHAY FARMS - F00175254	16-Jan-2003	106133	Surface Runoff	156	156	0	NW	21	50	17	4	05EB	COOKING/BEAVERHILL LAKE	CATHAY FARMS
00175254-00-00	RYLEY/REGISTRATION/CATHAY FARMS - F00175254	16-Jan-2003	106134	Surface Runoff	623	623	0	NE	16	50	17	4	05EB	COOKING/BEAVERHILL LAKE	CATHAY FARMS
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	70961	Surface Runoff	435	435	0	SW	28	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	70965	Surface Runoff	436	436	0	SW	28	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	70968	Surface Runoff	436	436	0	SW	28	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	70973	Surface Runoff	197	197	0	NE	29	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	70976	Surface Runoff	33	33	0	NE	30	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	70977	Surface Runoff	33	33	0	SE	30	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	70996	Surface Runoff	65	65	0	SW	32	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	71001	Surface Runoff	292	292	0	NW	22	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	71006	Surface Runoff	292	292	0	NW	22	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	71007	Surface Runoff	291	291	0	SE	22	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	71009	Surface Runoff	196	196	0	NW	23	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	71012	Surface Runoff	196	196	0	NE	23	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	71016	Surface Runoff	82	82	0	NE	13	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	71018	Surface Runoff	82	82	0	SE	13	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	71022	Surface Runoff	82	82	0	SW	13	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	71025	Surface Runoff	82	82	0	SW	13	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175341-00-00	RYLEY/REGISTRATION/LORNE & ROLAND BOOTH - F00175341	15-Mar-2002	71027	Surface Runoff	195	195	0	SW	35	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LORNE & ROLAND BOOTH
00175508-00-00	RYLEY/REGISTRATION/BUGGE KEVIN - F00175508	08-Apr-2003	114871	Unnamed Aquifer - Unclassified	85	85	0	NW	24	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BUGGE, KEVIN
00175508-00-00	RYLEY/REGISTRATION/BUGGE KEVIN - F00175508	08-Apr-2003	114872	Surface Runoff	85	85	0	NW	24	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BUGGE, KEVIN
00175508-00-00	RYLEY/REGISTRATION/BUGGE KEVIN - F00175508	08-Apr-2003	114873	Unnamed Aquifer - Unclassified	433	433	0	SW	24	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BUGGE, KEVIN
00175508-00-00	RYLEY/REGISTRATION/BUGGE KEVIN - F00175508	08-Apr-2003	114874	Surface Runoff	432	432	0	SW	24	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BUGGE, KEVIN
00175508-00-00	RYLEY/REGISTRATION/BUGGE KEVIN - F00175508	08-Apr-2003	114875	Surface Runoff	285	285	0	SW	26	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BUGGE, KEVIN
00175508-00-00	RYLEY/REGISTRATION/BUGGE KEVIN - F00175508	08-Apr-2003	114876	Unnamed Stream - Unclassified	87	87	0	SE	23	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BUGGE, KEVIN
00175508-00-00	RYLEY/REGISTRATION/BUGGE KEVIN - F00175508	08-Apr-2003	114877	Unnamed Stream - Unclassified	88	88	0	SE	23	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BUGGE, KEVIN
00175508-00-00	RYLEY/REGISTRATION/BUGGE KEVIN - F00175508	08-Apr-2003	114878	Unnamed Stream - Unclassified	195	195	0	NE	14	50	17	4	05EB	COOKING/BEAVERHILL LAKE	BUGGE, KEVIN
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85715	Surface Runoff	419	419	0	SE	16	50	17	4	05EE	VERMILION RIVER	LYONS, BRIAN
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85718	Surface Runoff	419	419	0	SE	16	50	17	4	05EE	VERMILION RIVER	LYONS, BRIAN
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85721	Surface Runoff	279	279	0	SE	16	50	17	4	05EE	VERMILION RIVER	LYONS, BRIAN
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85725	Surface Runoff	28	28	0	SE	16	50	17	4	05EE	VERMILION RIVER	LYONS, BRIAN
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85731	Surface Runoff	56	56	0	SW	16	50	17	4	05EE	VERMILION RIVER	LYONS, BRIAN
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85735	Surface Runoff	28	28	0	SW	16	50	17	4	05EE	VERMILION RIVER	LYONS, BRIAN
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85740	Surface Runoff	558	558	0	SE	4	51	17	4	05EE	VERMILION RIVER	LYONS, BRIAN
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85742	Surface Runoff	279	279	0	SW	4	51	17	4	05EE	VERMILION RIVER	LYONS, BRIAN

APPROVAL ID	APPROVAL NAME	EFFECTIVE DATE	WA ID	SOURCE	QUANTITY (m3)	CONSUMPTIVE (m3)	LOSSES (m3)	QUA	SEC	TWP	RNG	MER	WSC	RIVER SUB BASIN NAME	APPROVAL HOLDER
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85743	Surface Runoff	28	28	0	SE	5	51	17	4	05EE	VERMILION RIVER	LYONS, BRIAN
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85745	Surface Runoff	558	558	0	SW	29	50	17	4	05EE	VERMILION RIVER	LYONS, BRIAN
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85746	Surface Runoff	94	94	0	SW	29	50	17	4	05EE	VERMILION RIVER	LYONS, BRIAN
00176295-00-00	RYLEY/REGISTRATION/LYONS BRIAN - F00176295	28-Mar-2002	85749	Surface Runoff	39	39	0	NW	29	50	17	4	05EE	VERMILION RIVER	LYONS, BRIAN
00176300-00-00	VEGREVILLE/REGISTRATION/LYONS AUDREY - F00176300	19-Mar-2002	74426	Surface Runoff	104	104	0	NE	20	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LYONS, AUDREY
00176300-00-00	VEGREVILLE/REGISTRATION/LYONS AUDREY - F00176300	19-Mar-2002	74428	Unnamed Stream - Unclassified	456	456	0	NE	19	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LYONS, AUDREY
00176300-00-00	VEGREVILLE/REGISTRATION/LYONS AUDREY - F00176300	19-Mar-2002	74432	Unnamed Stream - Unclassified	215	215	0	NW	19	50	17	4	05EB	COOKING/BEAVERHILL LAKE	LYONS, AUDREY
00176325-00-00	RYLEY/REGISTRATION/NIMCHUK SHARON - F00176325	13-Mar-2002	67733	Unnamed Stream - Unclassified	7	7	0	NW	5	51	16	4	05EB	COOKING/BEAVERHILL LAKE	NIMCHUK, SHARON
00176325-00-00	RYLEY/REGISTRATION/NIMCHUK SHARON - F00176325	13-Mar-2002	67735	Unnamed Stream - Unclassified	193	193	0	NE	11	50	17	4	05EB	COOKING/BEAVERHILL LAKE	NIMCHUK, SHARON
00176506-00-00	RYLEY/REGISTRATION/RICHARD & JUDITH DUECK - F00176506	27-Mar-2002	83248	Unnamed Stream - Unclassified	390	390	0	SW	17	50	17	4	05EB	COOKING/BEAVERHILL LAKE	RICHARD & JUDITH DUECK
00176506-00-00	RYLEY/REGISTRATION/RICHARD & JUDITH DUECK - F00176506	27-Mar-2002	83703	Unnamed Stream - Unclassified	260	260	0	SW	17	50	17	4	05EB	COOKING/BEAVERHILL LAKE	RICHARD & JUDITH DUECK
00176506-00-00	RYLEY/REGISTRATION/RICHARD & JUDITH DUECK - F00176506	27-Mar-2002	83704	Unnamed Stream - Unclassified	260	260	0	SW	17	50	17	4	05EB	COOKING/BEAVERHILL LAKE	RICHARD & JUDITH DUECK
00176506-00-00	RYLEY/REGISTRATION/RICHARD & JUDITH DUECK - F00176506	27-Mar-2002	83705	Unnamed Stream - Unclassified	65	65	0	SW	17	50	17	4	05EB	COOKING/BEAVERHILL LAKE	RICHARD & JUDITH DUECK
00176506-00-00	RYLEY/REGISTRATION/RICHARD & JUDITH DUECK - F00176506	27-Mar-2002	83707	Unnamed Stream - Unclassified	175	175	0	SE	17	50	17	4	05EB	COOKING/BEAVERHILL LAKE	RICHARD & JUDITH DUECK
00176511-00-00	WAINWRIGHT/REGISTRATION/RAYMOND & PHEMIE HUNKA - F00176511	19-Mar-2002	74065	Surface Runoff	525	525	0	NW	34	49	17	4	05EB	COOKING/BEAVERHILL LAKE	RAYMOND & PHEMIE HUNKA
00176664-00-00	RYLEY/REGISTRATION/POPE DELBERT - F00176664	13-Mar-2002	68372	Unnamed Stream - Unclassified	101	101	0	SW	27	50	17	4	05EB	COOKING/BEAVERHILL LAKE	POPE, DELBERT
00176664-00-00	RYLEY/REGISTRATION/POPE DELBERT - F00176664	13-Mar-2002	68373	Unnamed Stream - Unclassified	151	151	0	SW	27	50	17	4	05EB	COOKING/BEAVERHILL LAKE	POPE, DELBERT
00176664-00-00	RYLEY/REGISTRATION/POPE DELBERT - F00176664	13-Mar-2002	68376	Unnamed Stream - Unclassified	101	101	0	SE	28	50	17	4	05EB	COOKING/BEAVERHILL LAKE	POPE, DELBERT
00176664-00-00	RYLEY/REGISTRATION/POPE DELBERT - F00176664	13-Mar-2002	68378	Unnamed Aquifer - Unclassified	26	26	0	SW	27	50	17	4	05EB	COOKING/BEAVERHILL LAKE	POPE, DELBERT
00176664-00-00	RYLEY/REGISTRATION/POPE DELBERT - F00176664	13-Mar-2002	68382	Unnamed Aquifer - Unclassified	26	26	0	SE	28	50	17	4	05EB	COOKING/BEAVERHILL LAKE	POPE, DELBERT
00176752-00-00	TOFIELD/REGISTRATION/BOETTGER KEVIN - F00176752	03-Apr-2003	114242	Surface Runoff	4,457	4,457	0	SW	8	52	18	4	05EB	COOKING/BEAVERHILL LAKE	BOETTGER, KEVIN
00176752-00-00	TOFIELD/REGISTRATION/BOETTGER KEVIN - F00176752	03-Apr-2003	114243	Unnamed Stream - Unclassified	123	123	0	SE	8	52	18	4	05EB	COOKING/BEAVERHILL LAKE	BOETTGER, KEVIN
00176752-00-00	TOFIELD/REGISTRATION/BOETTGER KEVIN - F00176752	03-Apr-2003	114244	Unnamed Stream - Unclassified	205	205	0	NW	30	49	17	4	05EB	COOKING/BEAVERHILL LAKE	BOETTGER, KEVIN
00176752-00-00	TOFIELD/REGISTRATION/BOETTGER KEVIN - F00176752	03-Apr-2003	114245	Unnamed Stream - Unclassified	205	205	0	SW	31	49	17	4	05EB	COOKING/BEAVERHILL LAKE	BOETTGER, KEVIN
00177122-00-00	RYLEY/REGISTRATION/SCHAFFER MOLLY & FENSKE MARILYNN - F00177122	07-Jun-2002	100637	Unnamed Aquifer - Unclassified	213	213	0	SW	14	50	17	4	05EB	COOKING/BEAVERHILL LAKE	MOLLY SCHAFFER & MARILYNN FENSKE
00177122-00-00	RYLEY/REGISTRATION/SCHAFFER MOLLY & FENSKE MARILYNN - F00177122	07-Jun-2002	100638	Unnamed Stream - Unclassified	213	213	0	SW	14	50	17	4	05EB	COOKING/BEAVERHILL LAKE	MOLLY SCHAFFER & MARILYNN FENSKE
00177122-00-00	RYLEY/REGISTRATION/SCHAFFER MOLLY & FENSKE MARILYNN - F00177122	07-Jun-2002	100639	Surface Runoff	213	213	0	SW	14	50	17	4	05EB	COOKING/BEAVERHILL LAKE	MOLLY SCHAFFER & MARILYNN FENSKE
00177122-00-00	RYLEY/REGISTRATION/SCHAFFER MOLLY & FENSKE MARILYNN - F00177122	07-Jun-2002	100640	Surface Runoff	214	214	0	SE	14	50	17	4	05EB	COOKING/BEAVERHILL LAKE	MOLLY SCHAFFER & MARILYNN FENSKE
00177122-00-00	RYLEY/REGISTRATION/SCHAFFER MOLLY & FENSKE MARILYNN - F00177122	07-Jun-2002	100641	Surface Runoff	214	214	0	NW	14	50	17	4	05EB	COOKING/BEAVERHILL LAKE	MOLLY SCHAFFER & MARILYNN FENSKE
00177122-00-00	RYLEY/REGISTRATION/SCHAFFER MOLLY & FENSKE MARILYNN - F00177122	07-Jun-2002	100642	Surface Runoff	214	214	0	NE	14	50	17	4	05EB	COOKING/BEAVERHILL LAKE	MOLLY SCHAFFER & MARILYNN FENSKE
00177122-00-00	RYLEY/REGISTRATION/SCHAFFER MOLLY & FENSKE MARILYNN - F00177122	07-Jun-2002	100643	Surface Runoff	214	214	0	NW	18	50	16	4	05EB	COOKING/BEAVERHILL LAKE	MOLLY SCHAFFER & MARILYNN FENSKE
00177137-00-00	RYLEY/REGISTRATION/LYLE OSLUND - F00177137	21-Mar-2002	77282	Unnamed Aquifer - Unclassified	481	481	0	NE	12	50	17	4	05EB	COOKING/BEAVERHILL LAKE	OSLUND, LYLE
00177137-00-00	RYLEY/REGISTRATION/LYLE OSLUND - F00177137	21-Mar-2002	77285	Surface Runoff	233	233	0	NE	12	50	17	4	05EB	COOKING/BEAVERHILL LAKE	OSLUND, LYLE
00177137-00-00	RYLEY/REGISTRATION/LYLE OSLUND - F00177137	21-Mar-2002	77287	Unnamed Stream - Unclassified	233	233	0	SE	12	50	17	4	05EB	COOKING/BEAVERHILL LAKE	OSLUND, LYLE
00177137-00-00	RYLEY/REGISTRATION/LYLE OSLUND - F00177137	21-Mar-2002	77289	Surface Runoff	228	228	0	NW	12	50	17	4	05EB	COOKING/BEAVERHILL LAKE	OSLUND, LYLE
00179561-00-00	MUNDARE/REGISTRATION/HOLYK LORNE - F00179561	19-Mar-2002	74335	Surface Runoff	65	65	0	NE	8	52	16	4	05EE	VERMILION RIVER	HOLYK, LORNE
00179561-00-00	MUNDARE/REGISTRATION/HOLYK LORNE - F00179561	19-Mar-2002	74336	Surface Runoff	295	295	0	NE	36	49	17	4	05EB	COOKING/BEAVERHILL LAKE	HOLYK, LORNE
00179798-00-00	FORT MCMURRAY/REGISTRATION/MIZERA BARRY	12-Apr-2002	86455	Surface Runoff	18	18	0	NW	14	49	17	4	05EE	VERMILION RIVER	MIZERA, BARRY
00179798-00-00	FORT MCMURRAY/REGISTRATION/MIZERA BARRY	12-Apr-2002	86456	Surface Runoff	142	142	0	NW	34	49	17	4	05EB	COOKING/BEAVERHILL LAKE	MIZERA, BARRY
00180090-00-00	RYLEY/REGISTRATION/POPE GORDON - F00180090	29-Apr-2002	88057	Unnamed Stream - Unclassified	1,315	1,315	0	SE	27	50	17	4	05EB	COOKING/BEAVERHILL LAKE	POPE, GORDON
00180574-00-00	RYLEY/REGISTRATION/STEINWAND NORBERT - F00180574	28-May-2002	97671	Unnamed Aquifer - Unclassified	685	685	0	NW	22	49	17	4	05EB	COOKING/BEAVERHILL LAKE	STEINWAND, NORBERT
00180574-00-00	RYLEY/REGISTRATION/STEINWAND NORBERT - F00180574	28-May-2002	97672	Unnamed Stream - Unclassified	126	126	0	SE	27	49	17	4	05EB	COOKING/BEAVERHILL LAKE	STEINWAND, NORBERT
00180574-00-00	RYLEY/REGISTRATION/STEINWAND NORBERT - F00180574	28-May-2002	97673	Unnamed Stream - Unclassified	126	126	0	SE	27	49	17	4	05EB	COOKING/BEAVERHILL LAKE	STEINWAND, NORBERT
00180574-00-00	RYLEY/REGISTRATION/STEINWAND NORBERT - F00180574	28-May-2002	97674	Surface Runoff	126	126	0	NW	22	49	17	4	05EB	COOKING/BEAVERHILL LAKE	STEINWAND, NORBERT
00180574-00-00	RYLEY/REGISTRATION/STEINWAND NORBERT - F00180574	28-May-2002	97677	Surface Runoff	126	126	0	NW	22	49	17	4	05EB	COOKING/BEAVERHILL LAKE	STEINWAND, NORBERT
00180574-00-00	RYLEY/REGISTRATION/STEINWAND NORBERT - F00180574	28-May-2002	97678	Surface Runoff	126	126	0	NW	22	49	17	4	05EB	COOKING/BEAVERHILL LAKE	STEINWAND, NORBERT
00180881-00-00	RYLEY/REGISTRATION/SHARLYN & RUSSELL TOLLEFSON - F00180881	15-Mar-2002	70707	Surface Runoff	1,040	1,040	0	NE	36	49	18	4	05EB	COOKING/BEAVERHILL LAKE	SHARLYN & RUSSELL TOLLEFSON
00183147-00-00	RYLEY/REGISTRATION/HUNKA ROBBIN - F00183147	19-Mar-2002	74081	Surface Runoff	525	525	0	NE	34	49	17	4	05EB	COOKING/BEAVERHILL LAKE	HUNKA, ROBIN



LEGEND

- Buried Valley
- Bedrock Elevation Contour
- Roadway
- Water body
- Site Location

Bedrock Formation

- Lower Horseshoe Canyon
- Bearpaw
- Oldman (Belly River Group)

NOTES

Geological data obtained from:
County of Beaver No.9
Revised Regional Groundwater Assesment
HCL, 1999
NRC, CanVec+ Base Map

STATUS
Issued for Use

2017 GROUNDWATER MONITORING PROGRAM, RYLEY, AB

Regional Geology

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

0 2 4 6
Kilometres

TETRA TECH

FILE NO.
AppendixBa - Regional Geology.srf

PROJECT NO.	DWN	CKD	APVD	REV
SWOP03652-01	CF	BS	AS	0

OFFICE	DATE
TtEBA-CAL	September 2017

Appendix B Figure A

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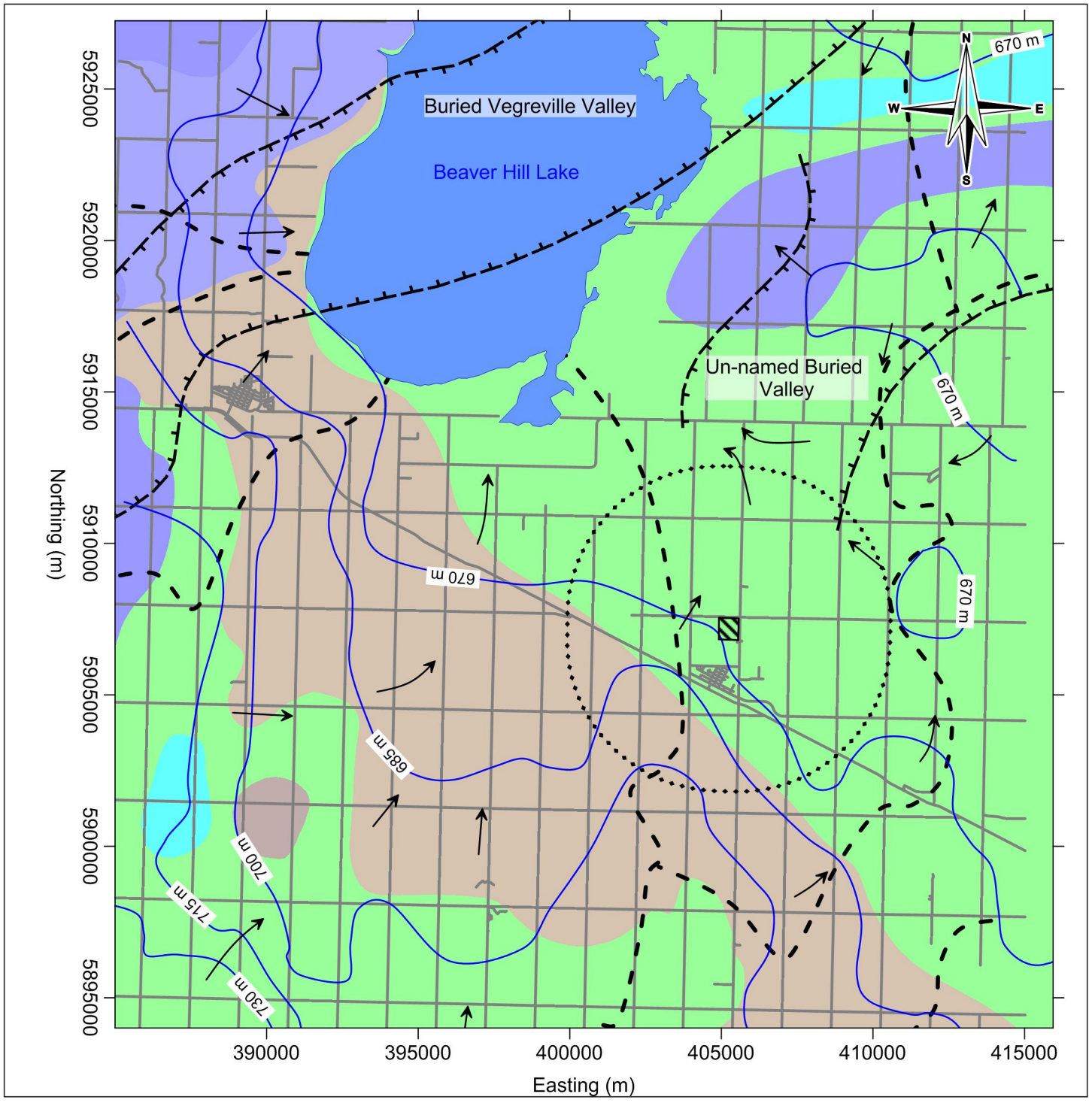


LEGEND

- Surface Water Divide
- Buried Valley
- Groundwater Flow Direction
- Groundwater Elevation
- Roadway
- Water body
- Site Location
- 5 km Site Radius

Expected Groundwater Yield (L/sec)

- < 0.1
- 0.1 - 0.4
- 0.4 - 2
- 2 - 8

NOTES

Hydrogeological data obtained from:
Hydrogeology of the Edmonton Area Southeast Segment, Alberta
R.Stein, 1982
NRC, CanVec+ Base Map

STATUS
Issued for Use

2017 GROUNDWATER MONITORING PROGRAM, RYLEY, AB

Regional Hydrogeology Groundwater Flow

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

0 2 4 6
Kilometres

TETRA TECH

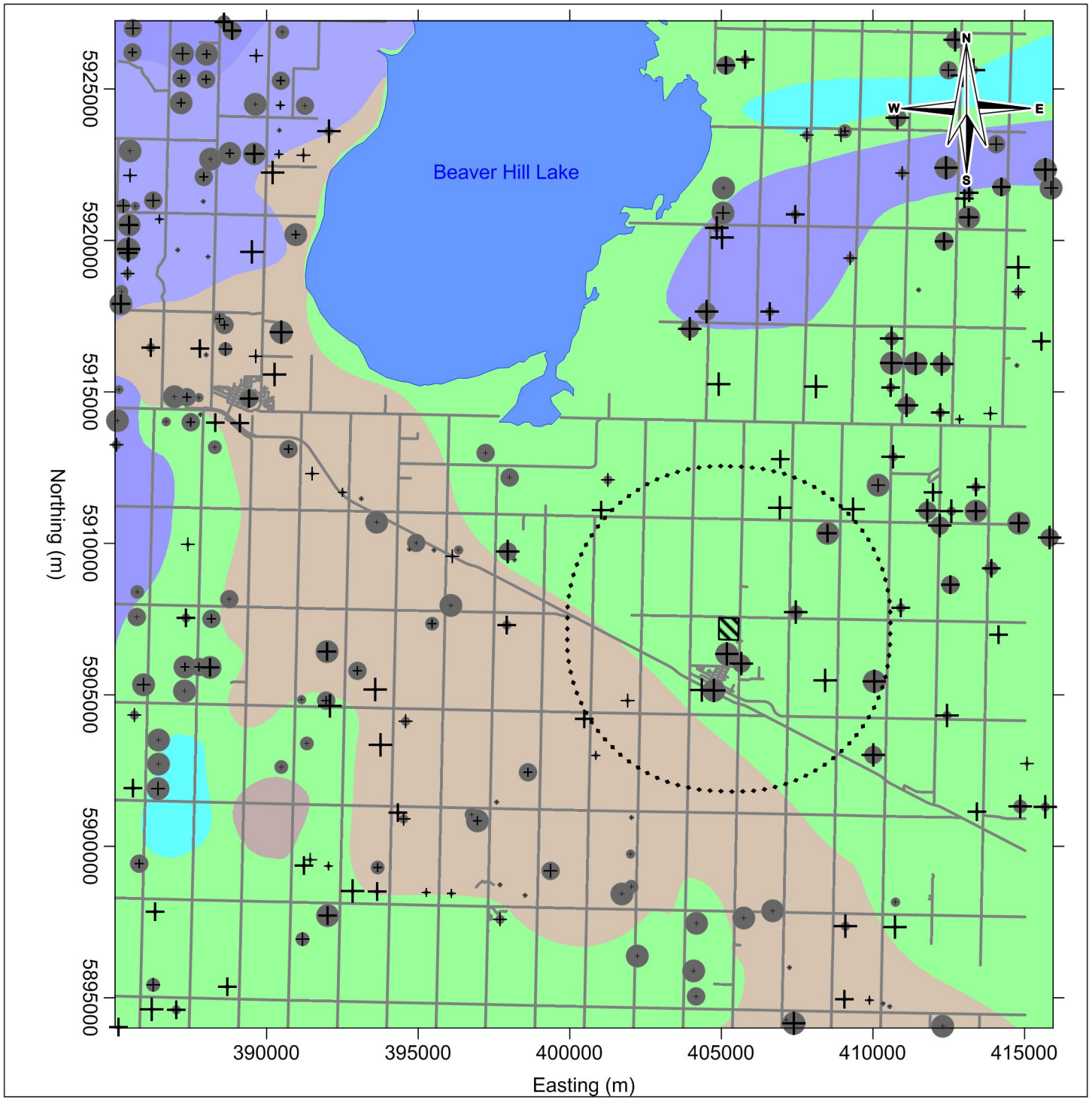
FILE NO. AppendixBb - Regional Hydrogeology.srf

PROJECT NO.	DWN	CKD	APVD	REV
SWOP03652-01	CF	BS	AS	0

OFFICE	DATE
TtEBA-CAL	September 2017

Appendix B Figure B

filepath:\\tt.local\eba\Projects\CGY\17807\0\SWOP03652\Data



LEGEND

Well Depth (m)
- 184-470
- 141-184
- 105-141
- 75-105
- 19-75
- Roadway
- Water body
- Site Location
- 5 km Site Radius

Recomended Pump Rate (L/sec)
- 0.44 - 3.15
- 0.32 - 0.44
- 0.25 - 0.32
- 0.14 - 0.25
- 0.03 - 0.14

Expected Groundwater Yield (L/sec)
- < 0.1
- 0.1 - 0.4
- 0.4 - 2
- 2 - 8

NOTES
Hydrogeological data obtained from:
Hydrogeology of the Edmonton Area Southeast Segment, Alberta
R.Stein, 1982
AB Water Well Information Database June 28, 2016
NRC, CanVec+ Base Map

STATUS
Issued for Use

2017 GROUNDWATER MONITORING PROGRAM, RYLEY, AB

Regional Hydrogeology Water Wells

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

0 2 4 6
Kilometres

TETRA TECH

FILE NO.
AppendixBc - Regional Hydrogeology.srf

PROJECT NO.	DWN	CKD	APVD	REV
SWPO03652-01	CF	BS	AS	0

OFFICE	DATE
TtEBA-CAL	September 2017

Appendix B Figure C

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APPENDIX C

BOREHOLE LOGS

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 01
NE 1/4, SEC. 10-50-17-W4M	DRILL: HOLLOW STEM AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 683.67 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, organics, damp, very soft, dark brown, (100mm thick)			
	SAND - trace to some silt, trace of organics, fine to medium grained, unstratified, dry, dense, medium to dark brown			683.0
1	- clayey, clay occurs in random 5mm thick layers, medium to coarse grained, moist, compact, light to medium brown		random backfill -	
	SAND AND CLAY - trace of coal crystals, moist, soft, medium to dark brown			682.0
	CLAY - some silt and fine grained sand, bentonitic, moist, very soft			
2	- silty, 1-2mm thick black laminae, damp, stiff, light brown		bentonite -	
	SANDSTONE - silty, bentonitic, weathered, fine to medium grained, matrix supported, very dense, grey		slotted section -	681.0
3			pea gravel -	
	SILTSTONE - clayey, trace of fine to medium grained, sand, damp, dense, grey			680.0
4			bentonite -	
	CLAY SHALE - silty, plated, damp, hard, dark grey to brown			679.0
5			random cuttings -	
	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - 3.19 metres at 6 hrs. - 2.21 metres at 10 days Piezometer installed to 3.5 metres			678.0
6				
				677.0
7				
7.5				

1 | 2 | 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-01	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 02
NE 1/4, SEC. 10-50-17-W4M	DRILL: HOLLOW STEM AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 686.17 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	1	2	3	Elevation (m)
0	TOPSOIL - silty, organics, roots, damp, very soft, dark brown						686.0
	CLAY (TILL) - silty, sandy, trace of subangular gravel, salt inclusions, unstratified, damp, very stiff, low plastic, medium brown						
1			random backfill -				685.0
2							684.0
	- moist, firm						
3	- dry to damp, very stiff, dark brown to black		bentonite -				683.0
	SANDSTONE - silty, bentonitic, weathered, fine to medium grained, dry, very dense, grey		slotted section -				
4			pea gravel -				682.0
	SILTSTONE - clayey, trace of fine to medium grained sand, clay shale stringers, damp, dense, grey						
5			bentonite -				681.0
	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - 3.99 metres at 4 hrs. - 3.92 metres at 10 days Piezometer installed to 4.6 metres						
6							680.0
7							679.0
7.5							

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-02	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 03
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 688.78 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL)		grout -	
1	GARBAGE		bentonite -	688.0
2	CLAY (FILL)			687.0
	GARBAGE		slotted section -	
3	CLAY (FILL)		sand filter -	686.0
	GARBAGE			
4	CLAY (TILL) - silty, sandy, gravel sizes, clay shale nodules, sandstone pockets, stiff, medium plastic, brown		random backfill -	685.0
5				684.0
6	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - dry at 0 hrs. - dry at 5 hrs. - dry at 10 days - dry at 25 days Well installed to 3.8 metres Note: Backfilled to 3.8 metres.			683.0
7				682.0
7.5				

1 2 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-03	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 04
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 688.17 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL)		grout -	688.0
1	GARBAGE		bentonite -	687.0
2				686.0
3	CLAY (FILL)		slotted section - sand filter -	685.0
4	GARBAGE			684.0
5	END OF BOREHOLE (4.7 metres) slough - none at 0 hrs. water - dry at 3 hrs. - dry at 10 days - dry at 25 days Well installed to 4.7 metres			683.0
6				682.0
7				681.0
7.5				

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.72 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-04	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 05
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 688.21 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL) - silty, sandy, sandstone inclusions, brown		grout -	688.0
1	GARBAGE			687.0
2			bentonite -	686.0
3				685.0
4				684.0
5			slotted section - sand filter -	683.0
6	SANDSTONE - silty, medium to coarse grained, very dense, grey		slough -	682.0
7	END OF BOREHOLE (6.1 metres) slough - 5.93 metres at 0 hrs. water - 5.3 metres at 2 hrs. - 5.37 metres at 10 days - 5.31 metres at 25 days Well installed to 5.93 metres			681.0
7.5				

1 2 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 6.1 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-05	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 06
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 684.47 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL) - silty, sandy, dessicated, low plastic, brown		grout -	684.0
1				
	GARBAGE - metal, cable		bentonite -	683.0
2				682.0
3			sand filter - slotted section -	681.0
4				680.0
	SANDSTONE - silty, coarse grained, dense, grey			
5	CLAY SHALE - silty, hard, high plastic, grey/brown			679.0
	END OF BOREHOLE (5.2 metres) slough - none at 0 hrs. water - 2.55 metres at 1 hr. - 2.17 metres at 10 days Well installed to 5.15 metres			
6				678.0
7				
7.5				677.0

1 2 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 5.15 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-06	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 08
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 685.53 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - organic silt, sandy, some clay, brown to black, frozen, (75mm thick)		grout -	685.0
	CLAY (TILL) - silty, sandy, occasional gravel sizes, low plastic, brown, frozen			
	- end of frost			
1			bentonite -	684.0
2	- coal pockets, moist, very stiff			
				683.0
	- sandstone and clay shale nodules, grey		slotted section -	
3	CLAY SHALE - carbonaceous, friable, very stiff, dark brown			
	SANDSTONE - silty, clayey, clay shale stringers and lenses, medium to coarse grained, moist, grey		sand filter -	682.0
4				
	END OF BOREHOLE (4.3 metres)			681.0
	slough - none at 0 hrs.			
	water - dry at 0 hrs.			
	- dry at 6 hrs.			
5	- 3.26 metres at 11 days			
	Well installed to 4.1 metres			680.0
6				
				679.0
7				
7.5				

1 | 2 | 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.26 m
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-08	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 09
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 685.77 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - organic silt, sandy, some clay, frozen, (100mm thick)		grout -	685.0
	CLAY (TILL) - silty, sandy, occasional gravel sizes, brown, frozen			
1	- end of frost		bentonite -	684.0
2				
	CLAY SHALE - silty, reworked, very stiff, high plastic, brown to grey			683.0
3			slotted section -	
	SANDSTONE AND CLAY SHALE - interbedded, sandstone - silty, clayey, dense, grey, clay shale - silty, very stiff, high plastic, grey/brown		sand filter -	
	SANDSTONE - silty, clayey, medium to coarse grained, damp, dense, grey			682.0
4				
	END OF BOREHOLE (4.4 metres)			681.0
	slough - none at 0 hrs.			
5	water - dry at 0 hrs.			
	- dry at 5 days			
	- 3.33 metres at 11 days			680.0
6	Well installed to 4.4 metres			
				679.0
7				
7.5				

1 | 2 | 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.41 m
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-09	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 10
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 683.96 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - (25mm thick)		grout -	
	CLAY - sandy, silty, white salt deposits, rust specks, dessicated, brown, frozen			
	- end of frost		bentonite -	
1	CLAY (TILL) - silty, sandy, gravel sizes, coal pockets, clay shale and sandstone nodules, damp, stiff, medium plastic, brown			683.0
	SANDSTONE - clayey, silty, clay shale stringers, weathered, medium to coarse grained, moist, brown to grey		slotted section -	
2				682.0
	- bentonitic, occasional clay shale stringers, dense, grey			
			sand filter -	
3				681.0
4				680.0
	END OF BOREHOLE (4.3 metres)			
	slough - none at 0 hrs.			
	water - dry at 0 hrs.			
	- dry at 4 hrs.			
	- dry at 11 days			
5	Well installed to 3.1 metres			679.0
6				678.0
7				677.0
7.5				

1 | 2 | 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.26 m
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-10	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 11
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 683.85 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silt, sandy, frozen, (50mm thick)		grout -	
	CLAY - silty, sandy, white salt stains, dessicated, brown			
	CLAY (TILL) - silty, sandy, gravel sizes, moist, low plastic, brown			
1				683.0
	CLAY SHALE - silty, plated, very stiff, brown		bentonite -	
2				682.0
			slotted section -	
3	- blocky, high plastic, grey			681.0
			sand filter -	
4				680.0
	END OF BOREHOLE (4.3 metres) slough - none at 0 hrs. water - dry at 0 hrs. - dry at 3 hrs. - dry at 11 days Well installed to 4.2 metres			
5				679.0
6				678.0
7				677.0
7.5				

1 2 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.26 m
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-11	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 12
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 684.2 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - organic silt, sandy, frozen, (50mm thick)		grout -	684.0
	CLAY - sandy, silt, white salt stains, rust specks, dessicated, brown			
1	CLAY (TILL) - silty, sandy, gravel sizes, stiff to very stiff, low plastic			683.0
	SANDSTONE - silty, clayey, clay shale stringers, oxidized, weathered, medium to coarse grained, brown		bentonite -	
2	- grey			682.0
3	CLAY SHALE - silty, friable, damp, hard, high plastic, brown		slotted section -	681.0
	- grey/brown		sand filter -	
4				680.0
	END OF BOREHOLE (4.3 metres) slough - none at 0 hrs. water - dry at 0 hrs. - dry at 2 hrs. - 3.54 metres at 11 days Well installed to 4.32 metres			
5				679.0
6				678.0
7				677.0
7.5				

1 | 2 | 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.26 m
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-12	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 13
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 686.66 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT	Elevation (m)
0	TOPSOIL - clayey, silty, organic, peaty, black				686.0
1	CLAY (TILL) - silty, sandy, occasional gravel, damp, stiff to very stiff, low to medium plastic, medium brown		A1		685.0
2	SANDSTONE (BEDROCK) - silty, fine grained, homogeneous, damp, poorly cemented, very low strength, green grey, pale grey speckling, glauconitic, interbedded with shale horizons - clay shale horizons - silty, medium to high plastic, dark grey		A2		684.0
3	END OF BOREHOLE (2.4 metres) Notes: Stopped due to auger refusal (cemented sandstone band) Permanent Monitoring well installed to 2.4 metres				683.0
4					682.0
5					681.0
6					680.0
7					
7.5					

PLASTIC M.C. LIQUID (20 40 60 80)

STANDARD PENETRATION (N) (20 40 60 80)

UNC. COMPRESSIVE STRENGTH (kPa) (50 100 150 200)

POCKET PEN. (kPa) (100 200 300 400)

MW13

TETRA TECH EBA

LOGGED BY: VS/VJ	COMPLETION DEPTH: 2.4 m
REVIEWED BY:	COMPLETE: 91/02/19
DRAWING NO: 11099-12	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 14
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 686.52 m

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

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

Depth (m)	SOIL DESCRIPTION	Elevation (m)
0	TOPSOIL (FILL) - slightly organic, dark brown	686.0
	- clayey	
1	CLAY (TILL) - silty, sandy, stiff to very stiff, medium plastic, grey, pebbles	685.0
2		
	- free water	684.0
	SANDSTONE (BEDROCK) - silty, some clay, fine grained, moist, dense, light grey, occasional shaly inclusion	
3		683.0
4	- clay shale inclusions - grey to brown	682.0
5 ▼ 0 hrs.		681.0
	END OF BOREHOLE (5.4 metres) water - 5.0 metres at 0 hrs. Monitoring well installed to 5.4 metres	
6		680.0
7		
7.5		

SAMPLE TYPE | MOISTURE CONTENT | PLASTIC M.C. LIQUID (20 40 60 80) | STANDARD PENETRATION (N) (20 40 60 80) | UNC. COMPRESSIVE STRENGTH (kPa) (50 100 150 200) | POCKET PEN. (kPa) (100 200 300 400) | MW14 (▼ 0 hrs.)

TETRA TECH EBA

LOGGED BY: VS/VJ	COMPLETION DEPTH: 5.4 m
REVIEWED BY:	COMPLETE: 92/07/22
DRAWING NO: 11099-12	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 01B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 687.85 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - sandy, roots, black, (150mm thick)		Pipe stickup = 0.91 metres	687.0
1	CLAY - silty, some oxide stains, white salt and carbonate pockets, damp, very stiff, medium plastic, grey brown - occasional pebbles, coal pockets, no visible white pockets, olive grey brown			686.0
2				
3	- moist, stiff			685.0
4	CLAY SHALE - silty, some sand, friable, damp, soft, low to medium plastic, dark grey			684.0
5	SANDSTONE - some silt and clay, fine to medium grained, friable, uncemented, blue green grey - clay shale interbeds			683.0
6				682.0
7	CLAY SHALE - sandstone interbeds - siltstone layer - some silt and clay, fine to medium grained, friable, uncemented, blue green grey			681.0
8				680.0
9				679.0
10	END OF BOREHOLE (9.9 metres) slough - none at 0 hrs. water - dry at 0 hrs. - 5.2 metres at 1 day Monitoring well installed to 9.9 metres			678.0
11				677.0
12				676.0

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.9 m
REVIEWED BY: SP	COMPLETE: 96/09/30
DRAWING NO: 12416-04	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 05B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 687.41 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, roots, moist, brown black, (150mm thick)		Pipe stickup = 0.91 metres	687.0
1	CLAY - silty, sandy, some salt inclusions, pebbles, coal pockets, oxide stains, very fine grained sand, damp, stiff, medium plastic, grey brown			686.0
	- more silty, less sand, moist			
2				685.0
3	- harder			684.0
	CLAY SHALE - silty, some sand, damp, hard, high plastic, green grey with dark blue pockets			
4	SANDSTONE - some clay, silt, fine to medium grained, friable, hard, low plastic, blue green grey			683.0
5	- clay shale lenses			682.0
6	SILTSTONE - pebbles, strongly cemented, dry, hard, light grey			681.0
	CLAY SHALE - silty, some sand, damp, hard, high plastic, green grey with dark blue pockets			
7	SILTSTONE - pebbles, strongly cemented, dry, hard, light grey			680.0
	CLAY SHALE - silty, some sand, damp, hard, high plastic, green grey with dark blue pockets			
8	- less silt and sand, stronger, dry, dark grey			679.0
9 ▼				678.0
10	END OF BOREHOLE (9.8 metres) slough - none at 0 hrs. water - dry at 0 hrs. - 9.1 metres at 7 days Monitoring well installed to 9.8 metres			677.0
11				676.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.75 m
REVIEWED BY: SP	COMPLETE: 96/09/23
DRAWING NO: 12416-02	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 12B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 687.09 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, roots, black, (150mm thick)		Pipe stickup = 0.76 metres	687.0
1	CLAY (TILL) - silty, some sand, salt pockets, oxide stains, damp, very stiff, medium plastic, brown			686.0
2	- sand lense - silty, clay, fine to medium grained, firm, medium plastic, mottled brown grey - some pebbles, coal pockets, moist, stiff, green brown			685.0
3	CLAY SHALE - silty, dry to damp, hard, high plastic, dark grey			684.0
4				683.0
5	SANDSTONE - silty, some clay, fine to medium grained, friable, uncemented, damp, soft, low plastic, blue green grey - siltstone layer - strongly cemented, hard, light grey, (100mm thick) - sandier			682.0
6	SILTSTONE - strongly cemented, hard, light grey CLAY SHALE - silty, some sand, glauconitic sand layers, damp to moist, hard, medium plastic, blue green grey to brown grey			681.0
7				680.0
8				679.0
9	- brown grey			678.0
10	END OF BOREHOLE (9.9 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.9 metres			677.0
11				676.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.9 m
REVIEWED BY: SP	COMPLETE: 96/09/30
DRAWING NO: 12416-03	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 18A
	DRILL: HOLLOW STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 687.16 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, roots, soft, low plastic, grey black		Pipe stickup = 0.76 metres	687.0
1	SAND - silty, clayey, some pebbles, orange oxide stains, friable, loose, low plastic, grey brown			686.0
	CLAY (TILL) - silty, orange oxide stains, blocky, very stiff to hard, medium to high plastic, mottled grey brown			
2				685.0
3	CLAY SHALE AND SANDSTONE - interbedded, clay shale - silty, damp, hard, high plastic, mottled brown grey			684.0
4	sandstone - silty, glauconitic, fine to medium grained, friable, uncemented, damp, blue green grey			683.0
	SANDSTONE - with clay shale seams			
5				682.0
	SILTSTONE - some sand, cemented, friable, dry, light grey			
6	SANDSTONE - with clay shale seams 13-25mm thick			681.0
7	CLAY SHALE - with sandstone seams			680.0
8	- no visible sandstone seams			679.0
9	- sandstone seam			678.0
10	SILTSTONE - some clay, cemented, dry, hard, light brown			677.0
	END OF BOREHOLE (9.9 metres) slough - none at 0 hrs. water - dry at 0 hrs.			
11	Monitoring well installed to 9.9 metres			676.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.9 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-05	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 18B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 687.15 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, roots, soft, low plastic, grey black		Pipe stickup = 0.76 metres	687.0
1	SAND - silty, clayey, some pebbles, orange oxide stains, friable, loose, low plastic, grey brown			686.0
	CLAY (TILL) - silty, orange oxide stains, blocky, very stiff to hard, medium to high plastic, mottled grey brown			
2				685.0
3				684.0
4 ▼	CLAY SHALE AND SANDSTONE - interbedded, clay shale - silty, damp, hard, high plastic, mottled brown grey sandstone - silty, glauconitic, fine to medium grained, friable, uncemented, damp, blue green grey			683.0
	SANDSTONE - with clay shale seams			
5				682.0
	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - 4.0 metres at 0 hrs. Monitoring well installed to 5.3 metres			
6				681.0
7				680.0
8				679.0
9				678.0
10				677.0
11				676.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 5.33 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-06	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 19A
	DRILL: HOLLOW STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 686.46 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL) - silty, sandy, moist, soft, medium plastic, yellow brown, (100mm thick)		Pipe stickup = 0.76 metres	686.0
1	CLAY - silty, some sand pockets, salt pockets, damp, stiff, medium plastic, mottled grey brown			685.0
	- moist, softer			
2	- clay layer - oxidized, blocky, (75mm thick)			684.0
3	SANDSTONE - clayey, silty, glauconitic, fine to medium grained, poorly cemented, friable, damp, very stiff, blue green grey			683.0
	- wet			
4	- clay shale seams			682.0
5	SANDSTONE AND CLAY SHALE - interbedded			681.0
6	CLAY SHALE - silty, some sand interbeds, damp, hard, high plastic, dark grey			680.0
	- more frequent sandstone layers			
7	- no visible sandstone layers			679.0
8	- 13-25mm thick sandstone seams			678.0
9				677.0
10	END OF BOREHOLE (9.9 metres) slough - 9.6 metres at 0 hrs. water - 2.1 metres at 0 hrs. Monitoring well installed to 9.9 metres			676.0
11				675.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.9 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-07	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 19B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 686.54 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL) - silty, sandy, moist, soft, medium plastic, yellow brown, (100mm thick)		Pipe stickup = 0.76 metres	686.0
1	CLAY - silty, some sand pockets, salt pockets, damp, stiff, medium plastic, mottled grey brown			685.0
	- moist, softer			
2	- clay layer - oxidized, blocky, (75mm thick)			684.0
3	SANDSTONE - clayey, silty, glauconitic, fine to medium grained, poorly cemented, friable, damp, very stiff, blue green grey			683.0
	- wet			
4	- clay shale seams			682.0
5	SANDSTONE AND CLAY SHALE - interbedded			681.0
6	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - 2.1 metres at 0 hrs. Monitoring well installed to 5.3 metres			680.0
7				679.0
8				678.0
9				677.0
10				676.0
11				675.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 5.33 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-08	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 20A
	DRILL: HOLLOW STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 688.94 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, roots, brown black, (300mm thick)		Pipe stickup = 0.76 metres	
	CLAY (TILL) - silty, sandy, some pebbles, abundant salt pockets, roots to 0.5 metres, dry, hard, medium plastic, grey brown			
1				688.0
2	- 2-4mm thick white carbonate salt seams at 13mm spacing			687.0
3	- orange oxide stains, coal pockets, very stiff			686.0
4				685.0
	CLAY SHALE - silty, some sand lenses, friable, damp, hard, high plastic, dark grey			
5				684.0
	SANDSTONE - silty, clay shale seams, medium grained, friable, uncemented, damp, blue green grey			
	CLAY SHALE AND SANDSTONE - interbedded			
6				683.0
	SANDSTONE - with 25mm thick clay shale layers			
7				682.0
	SILTSTONE - clayey, very fine grained, cemented, dry, hard, light grey			
8	CLAY SHALE AND SANDSTONE - interbedded			681.0
	CLAY SHALE - silty, some sand lenses, friable, damp, hard, high plastic, dark grey			
9				680.0
10	END OF BOREHOLE (9.9 metres) slough - 9.7 metres at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.9 metres			679.0
11				678.0
12				677.0

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.9 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-09	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 20B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 688.99 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, roots, brown black, (300mm thick)		Pipe stickup = 0.76 metres	
1	CLAY (TILL) - silty, sandy, some pebbles, abundant salt pockets, roots to 0.5 metres, dry, hard, medium plastic, grey brown			688.0
2	- 2-4mm thick white carbonate salt seams at 13mm spacing			687.0
3	- orange oxide stains, coal pockets, very stiff			686.0
4	CLAY SHALE - silty, some sand lenses, friable, damp, hard, high plastic, dark grey			685.0
5	SANDSTONE - silty, clay shale seams, medium grained, friable, uncemented, damp, blue green grey			684.0
	CLAY SHALE AND SANDSTONE - interbedded			
6	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - 5.2 metres at 0 hrs. Monitoring well installed to 5.3 metres			683.0
7				682.0
8				681.0
9				680.0
10				679.0
11				678.0
12				677.0

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 5.33 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-10	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 21A
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	628.02N; 1001.60E	ELEVATION: 687.65 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, rootlets, dark brown, (50mm thick)		Pipe stickup = 0.73 metres	
	SILT AND CLAY - abundant salt deposits, friable, dry, loose, light brown			
1	CLAY (TILL) - silty, trace of sand, friable, damp to moist, very stiff, low to medium plastic, mottled brown			687.0
2				686.0
	SANDSTONE - interbedded clay seams, silty, some 50mm angular rock, brown nodules, medium grained, uncemented, damp to moist, olive blue			
3	- dry to moist, blue green			685.0
	- free water			684.0
4				
	SILTSTONE - very fine grained, cemented, dry, hard, light grey			683.0
5	- trace of fine gravel to 5mm diameter			
	CLAY SHALE AND SANDSTONE - interbedded, medium grained, uncemented, moist, stiff, medium plastic, grey brown clay shale, blue-green sandstone			682.0
6				
	CLAY SHALE - trace of gravel to 2mm diameter, friable, damp to moist, very stiff to hard, low to medium plastic, grey			681.0
7	SILTSTONE - friable, cemented, dry, grey			
	CLAY SHALE - silty, some sand lenses and brown lenses, friable, damp, hard, low to medium plastic, grey			680.0
8	CLAY SHALE AND SILTSTONE - interbedded			
9				679.0
				678.0
10	END OF BOREHOLE (9.9 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.9 metres			
11				677.0
				676.0
12				

TETRA TECH EBA

LOGGED BY: JSF	COMPLETION DEPTH: 9.9 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-01	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 21B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	626.61N; 1001.58E	ELEVATION: 687.55 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, rootlets, dark brown, (50mm thick)		Pipe stickup = 1.04 metres	687.0
	SILT AND CLAY - abundant salt deposits, friable, dry, loose, light brown			
1	CLAY (TILL) - silty, trace of sand, friable, damp to moist, very stiff, low to medium plastic, mottled brown			686.0
2				
	SANDSTONE - interbedded clay seams, silty, some 50mm angular rock, brown nodules, medium grained, uncemented,			685.0
3	damp to moist, olive blue - dry to moist, blue green			
	- free water			684.0
4				
	SILTSTONE - very fine grained, cemented, dry, hard, light grey			683.0
5	- trace of fine gravel to 5mm diameter			
	END OF BOREHOLE (5.0 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 4.9 metres			682.0
6				
				681.0
7				
				680.0
8				
				679.0
9				
				678.0
10				
				677.0
11				
				676.0
12				

TETRA TECH EBA

LOGGED BY: JSF	COMPLETION DEPTH: 5.02 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-02	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 22A
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	591.82N; 1069.20E	ELEVATION: 687.86 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	SILT AND CLAY - salt deposits, friable, damp, soft, low plastic, brown		Pipe stickup = 0.88 metres	
1	CLAY (TILL) - silty, moist, stiff, medium plastic, mottled brown - salt streaks			687.0
2	- gypsum, oxide stains			686.0
3	SANDSTONE - some clay, trace of pebbles, medium grained, uncemented, damp to moist, brown - oxide stains, very moist - interbedded clay seams, silty, brown nodules, olive green			685.0
4	- 50mm angular rock			684.0
5	CLAY SHALE - trace of very hard siltstone, friable, cemented, dry to damp, hard, medium plastic, grey - trace of sand, medium grained			683.0
6				682.0
7	- brown nodules			681.0
8				680.0
9	CLAY SHALE AND SANDSTONE - interbedded, medium grained, damp to moist, hard, low to medium plastic, grey mottled brown			679.0
	SILTSTONE - trace of gravel to 5mm diameter, cemented, dry, very hard, light grey			
10	CLAY SHALE AND SILTSTONE - interbedded			678.0
	END OF BOREHOLE (10.1 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.8 metres			
11				677.0
12				676.0

TETRA TECH EBA

LOGGED BY: JSF	COMPLETION DEPTH: 10.05 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-03	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 22B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	590.10N; 1069.07E	ELEVATION: 687.8 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	SILT AND CLAY - salt deposits, friable, damp, soft, low plastic, brown		Pipe stickup = 0.97 metres	
1	CLAY (TILL) - silty, moist, stiff, medium plastic, mottled brown - salt streaks			687.0
2	- gypsum, oxide stains			686.0
3	SANDSTONE - some clay, trace of pebbles, medium grained, uncemented, damp to moist, brown - oxide stains, very moist - interbedded clay seams, silty, brown nodules, olive green			685.0
4	- 50mm angular rock			684.0
5	CLAY SHALE - trace of very hard siltstone, friable, cemented, dry to damp, hard, medium plastic, grey			683.0
6	END OF BOREHOLE (5.0 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 4.9 metres			682.0
7				681.0
8				680.0
9				679.0
10				678.0
11				677.0
12				676.0

TETRA TECH EBA

LOGGED BY: JSF	COMPLETION DEPTH: 5.02 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-04	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 23A
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	601.96N; 1114.83E	ELEVATION: 686.44 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY - very silty, disturbed, very moist, soft to firm, high plastic, brown		Pipe stickup = 0.72 metres	686.0
1	SAND - silty, some clay, fine grained, moist, rust colour - some clay and silt, oxide stains, moist to very moist, firm to dense			685.0
2	SANDSTONE - some clay, trace of gravel to 2mm diameter, brown nodules, uncemented, firm to very firm, olive green - free water			684.0
3	- clay shale interbedded, silty, medium grained, uncemented, friable, damp to moist, very stiff to hard, low to medium plastic, grey clay shale, olive green sandstone			683.0
4	- trace of siltstone, hard, medium plastic, brown			682.0
5				681.0
6	SILTSTONE - uncemented, dry to damp, hard, low plastic, brown			680.0
7	CLAY SHALE AND SANDSTONE - interbedded, friable, damp to moist, hard, mottled grey			679.0
8				678.0
9	CLAY SHALE AND SILTSTONE - trace of sand, damp, hard, mottled grey			677.0
10	END OF BOREHOLE (9.9 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.9 metres			676.0
11				675.0
12				

TETRA TECH EBA

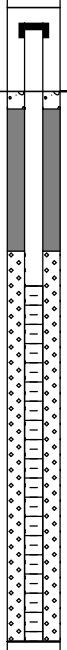
LOGGED BY: JSF	COMPLETION DEPTH: 9.9 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-05	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 23B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	601.22N; 1114.44E	ELEVATION: 686.49 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY - very silty, disturbed, very moist, soft to firm, high plastic, brown		Pipe stickup = 0.59 metres	686.0
1	SAND - silty, some clay, fine grained, moist, rust colour - some clay and silt, oxide stains, moist to very moist, firm to dense			685.0
2	SANDSTONE - some clay, trace of gravel to 2mm diameter, brown nodules, uncemented, firm to very firm, olive green - free water			684.0
3	- clay shale interbedded, silty, medium grained, uncemented, friable, damp to moist, very stiff to hard, low to medium plastic, grey clay shale, olive green sandstone			683.0
4	- trace of siltstone, hard, medium plastic, brown			682.0
5	END OF BOREHOLE (4.7 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 4.7 metres			681.0
6				680.0
7				679.0
8				678.0
9				677.0
10				676.0
11				675.0
12				



TETRA TECH EBA

LOGGED BY: JSF	COMPLETION DEPTH: 4.72 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-06	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 24A
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 688.68 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	GRAVEL (FILL)		Pipe stickup = 1.04 metres	
1	CLAY (TILL) - silty, trace of oxides, moist, hard, brown			688.0
2				687.0
3				686.0
4	CLAY SHALE - silty, damp, hard, grey			685.0
5				684.0
6	SANDSTONE - silty, very moist, loose, blue grey			683.0
7				682.0
8	SILTSTONE - cemented, loose, light brown grey			681.0
9	SANDSTONE - trace of clay shale			680.0
10	END OF BOREHOLE (9.91 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.69m			679.0
11				678.0
12				677.0

TETRA TECH EBA

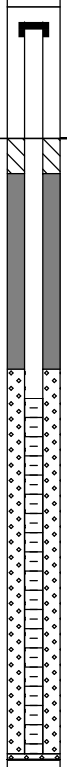
LOGGED BY: DM	COMPLETION DEPTH: 9.91 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-01	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 24B
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 688.61 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	GRAVEL (FILL)		Pipe stickup = 1.00 metre	688.0
1	CLAY (TILL) - silty, trace of oxides, moist, hard, brown			687.0
2				686.0
3				685.0
4	CLAY SHALE - silty, damp, hard, grey			684.0
5				683.0
6	END OF BOREHOLE (5.33 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 5.28m			682.0
7				681.0
8				680.0
9				679.0
10				678.0
11				677.0
12				



TETRA TECH EBA

LOGGED BY: DM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-02	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 25A
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 686.55 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - rootlets, moist, soft, grey		Pipe stickup = 1.00 metre	686.0
1	CLAY SHALE - silty, loose, hard, brown			685.0
2	SANDSTONE - silty, moist, loose, blue grey			684.0
3	- wet			683.0
4	CLAY SHALE - moist, loose, brown			682.0
5				681.0
6				680.0
7				679.0
8				678.0
9	- very moist, grey			677.0
10	END OF BOREHOLE (9.91 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.91m			676.0
11				675.0
12				

TETRA TECH EBA

LOGGED BY: DM	COMPLETION DEPTH: 9.91 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-03	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 25B
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 686.71 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - rootlets, moist, soft, dark		Pipe stickup = 0.79 metres	686.0
1	CLAY SHALE - silty, hard, loose, brown			685.0
2	SANDSTONE - silty, moist, loose, blue grey			684.0
3	- wet			683.0
4	CLAY SHALE - moist, loose, brown			682.0
5				681.0
6	END OF BOREHOLE (5.33 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 5.28m			680.0
7				679.0
8				678.0
9				677.0
10				676.0
11				675.0
12				

TETRA TECH EBA

LOGGED BY: DM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-04	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 26A
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 686.7 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - rootlets, moist, soft, grey		Pipe stickup = 0.92 metres	
1	CLAY SHALE - silty, dry, loose, hard, brown			686.0
2				685.0
3	SANDSTONE - silty, wet, loose, blue grey			684.0
4				683.0
5	SILTSTONE - cemented, loose, light brown			682.0
6	SANDSTONE - silty, moist, loose, blue grey			681.0
7				680.0
8	SILTSTONE - cemented, loose, light brown			679.0
9	CLAY SHALE - silty, hard, brown			678.0
10	END OF BOREHOLE (9.91 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 10.05m			677.0
11				676.0
12				675.0

TETRA TECH EBA

LOGGED BY: DM	COMPLETION DEPTH: 9.91 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-05	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 26B
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 686.8 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - rootlets, moist, soft, dark		Pipe stickup = 0.85 metres	
1	CLAY SHALE - silty, dry, hard, brown			686.0
2				685.0
3	SANDSTONE - silty, wet, loose, blue grey			684.0
4				683.0
5	SILTSTONE - cemented, loose, light brown SANDSTONE - silty, moist, loose, blue grey			682.0
6	END OF BOREHOLE (5.33 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 5.43m			681.0
7				680.0
8				679.0
9				678.0
10				677.0
11				676.0
12				675.0

TETRA TECH EBA

LOGGED BY: DM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-06	Page 1 of 1

CLEAN HARBORS 2007 GROUNDWATER MONITORING	CLEAN HARBORS CANADA INC.	BOREHOLE NO: 27A
	DRILL: SOLID STEM AUGER	PROJECT: E22101022
RYLEY, ALBERTA		ELEVATION: 686.91 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - clay, silty, dry, low plastic, black and grey, rootlets, (150mm thick)		Pipe stickup = 0.82 metres	
	CLAY (TILL) - silty, moist, hard, medium plastic, brown, oxide staining			
1	SAND - silty, massive, medium grained, moist, loose, olive green to brown, iron oxide staining			686.0
2	- blue green			685.0
3	- wet, interbedded with siltstone - cemented, dry, hard, grey to light brown			684.0
4				683.0
5				682.0
6	SILTSTONE - cemented, dry, hard, grey to light brown			681.0
7				680.0
8				679.0
9				678.0
10				677.0
11 (0 hrs.)	END OF BOREHOLE (10.67 metres) water - 10.67 metres at 0 hrs. Monitoring well installed to 10.67 metres			676.0 (0 hrs.)
12				675.0

TETRA TECH EBA

LOGGED BY: AS	COMPLETION DEPTH: 10.67 m
REVIEWED BY: AS	COMPLETE: 07/10/01
DRAWING NO: 22101022-01	Page 1 of 1

CLEAN HARBORS 2007 GROUNDWATER MONITORING	CLEAN HARBORS CANADA INC.	BOREHOLE NO: 27B
	DRILL: SOLID STEM AUGER	PROJECT: E22101022
RYLEY, ALBERTA		ELEVATION: 687.01 m

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - clay, silty, dry, low plastic, black and grey, rootlets, (150mm thick)		Pipe stickup = 0.80 metres	687.0
	CLAY (TILL) - silty, moist, hard, medium plastic, brown, oxide staining			
1	SAND - silty, massive, medium grained, moist, loose, olive green to brown, iron oxide staining			686.0
2	- blue green			685.0
3	- wet, interbedded with siltstone - cemented, dry, hard, grey to light brown			684.0
4				683.0
5	SILTSTONE - cemented, dry, hard, grey to light brown			682.0
6				681.0
7	END OF BOREHOLE (6.65 metres) water - 6.61 metres at 0 hrs. Monitoring well installed to 6.65 metres			680.0
8				679.0
9				678.0
10				677.0
11				676.0
12				

0 hrs.

TETRA TECH EBA

LOGGED BY: AS	COMPLETION DEPTH: 6.65 m
REVIEWED BY: AS	COMPLETE: 07/10/01
DRAWING NO: 22101022-02	Page 1 of 1

2011 GROUNDWATER MONITORING PROGRAM	CLEAN HARBOR	BOREHOLE NO: MW01C
	DRILL: SOLID STEM AUGER	PROJECT: E22101936
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	TOPSOIL - moist, loose, non plastic, black, trace of roots, (300 mm thick)			0
	CLAY - silty, moist, firm, high plastic, light brown			
1	- trace of cobbles, trace of iron			5
2				
2 hrs ▼	- trace of coal			2 hrs ▼ 10
3	CLAY SHALE - moist, hard, low plastic, grey, trace of white precipitates			
4	SANDSTONE - moist, hard, low plastic, dark greenish grey			15
5	END OF BOREHOLE (5.33 metres) water - 2.35 metres at 2 hrs. Monitoring well installed to 5.55 metres			
6				20
7				25
8				
9				30
10				33

TETRA TECH EBA

LOGGED BY: KF/MC	COMPLETION DEPTH: 5.33 m
REVIEWED BY: MH	COMPLETE: 11/06/14
DRAWING NO: 22101936-01	Page 1 of 1

2012 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS CANADA INC.	BOREHOLE NO: MW08A
CLASS I WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	PROJECT: E22103058-01
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	PAVEMENT - (100 mm thick)			0
	GRAVEL AND PEBBLE (FILL) - moist, soft, brown, (300 mm thick)			
1	CLAY - some sand, moist, hard, medium plastic, black, some coal, silt inclusions			5
	- silty, brown, iron and silt inclusions			
2				
	SAND - coarse grained, wet, soft, green grey			10
3	- hard			
4	SILTSTONE - some pebbles, dry, extremely weak, light grey			15
	SAND - some silt and clay, moist, hard, low plastic, grey blue			
5	- siltstone lens - dry, extremely weak, light grey			
6				20
7 ▼ 0 hrs.	- saturated, grey, water lenses			▼ 0 hrs.
	SILTSTONE - some clay, cemented, extremely weak, grey			25
8				
9	CLAY - some silt and sand, dry, hard, grey			30
10	END OF BOREHOLE (10.00 metres)			
	water - 6.91 metres at 0 hrs.			35
11	Monitoring well installed to 10.00 metres			
12				39

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 10 m
REVIEWED BY: MH	COMPLETE: 12/10/04
DRAWING NO: 22103058-01	Page 1 of 1

2012 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS CANADA INC.	BOREHOLE NO: MW08B
CLASS I WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	PROJECT: E22103058-01
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	PAVEMENT - (100 mm thick)			0
	GRAVEL AND PEBBLE (FILL) - moist, soft, red brown, (300 mm thick)			
1	CLAY - some sand, moist, hard, medium plastic, black, some coal, white silt inclusions			5
	- silty, brown, iron, silt and coal inclusions			
2				
	SAND - some silt, coarse grained, wet, green blue, some silt inclusions			
3	0 hrs.			10 0 hrs.
4				
	END OF BOREHOLE (4.50 metres)			
5	water - 2.76 metres at 0 hrs.			15
	Monitoring well installed to 4.63 metres			
6				20
7				25
8				
9				30
10				
11				35
12				39

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 4.5 m
REVIEWED BY: MH	COMPLETE: 12/10/04
DRAWING NO: 22103058-02	Page 1 of 1

2012 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS CANADA INC.	BOREHOLE NO: MW28A
CLASS I WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	PROJECT: E22103058-01
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (TILL) - silty, moist, hard, medium plastic, light brown, iron inclusions			0
1	- some sand, loose, brown, coal inclusions			5
2	SAND - coarse grained, moist, loose, brown, iron inclusions - blue green			10
3	SILTSTONE - cemented, dry, extremely weak, grey			15
4	SAND - coarse grained, wet, hard, blue green, some clay pockets, silt inclusions			20
5	- silty, dry, grey, silty inclusions			25
6	SILTSTONE - fine grained, moist, extremely weak, grey blue to light brown, silty inclusions			30
7				
8				
9				
10 (15 min.)	- dry, grey			35
11	END OF BOREHOLE (10.50 metres) water - 9.84 metres at 15 minutes Monitoring well installed to 10.86 metres			
12				39

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 10.5 m
REVIEWED BY: MH	COMPLETE: 12/10/04
DRAWING NO: 22103058-03	Page 1 of 1

2012 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS CANADA INC.	BOREHOLE NO: MW28B
CLASS I WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	PROJECT: E22103058-01
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (TILL) - silty, sticky, moist, hard, medium plastic, iron inclusions			0
1				5
2	SAND - coarse grained, wet, light brown			
	- blue			10
3	SILTSTONE - cemented, dry, extremely weak, grey			
	SAND - silty, moist, hard, grey, some blue lenses, silty white inclusions			15
4				
5	- some clay			
6 (0 hrs.)	END OF BOREHOLE (6.00 metres) water - 5.83 metres at 0 hrs. Monitoring well installed to 6.19 metres			20 (0 hrs.)
7				25
8				
9				30
10				
11				35
12				39

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 6 m
REVIEWED BY: MH	COMPLETE: 12/10/04
DRAWING NO: 22103058-04	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW29A
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - moist, high plastic, brown, (300 mm thick)		Pipe stickup = 0.81 metres	0
1	SAND (TILL) - fine grained, moist, loose, dark brown - reddish brown			
2	CLAY (TILL) - sandy, moist, firm, brown, silt, iron and coal inclusions - dry, reddish brown, white precipitates			5
3	SAND - medium grained, moist, firm, brown, iron and white precipitates throughout			10
4	- bluish grey, clay seams throughout			15
5	SANDSTONE - medium grained, very firm, grey, dark grey mottles throughout			20
6				
7				25
8				
9	END OF BOREHOLE (9.00 metres) water - 3.28 metres at 0 hrs. Monitoring well installed to 9.41 metres			30
10				
11				35
12				40
13				
14				45
15				49

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 9 m
REVIEWED BY: TD	COMPLETE: 14/10/06
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW29B
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - moist, high plastic, brown, (300 mm thick)		Pipe stickup = 0.79 metres	0
1	SAND (TILL) - fine grained, moist, loose, dark brown - reddish brown			
	CLAY (TILL) - sandy, moist, firm, brown, silt, iron and coal inclusions			5
2	- dry, reddish brown, white precipitates			
3	SAND - medium grained, moist, firm, brown, iron and white precipitates throughout			10
4	- bluish grey, clay seams throughout			
	END OF BOREHOLE (4.50 metres) water - 3.89 metres at 0 hrs. Monitoring well installed to 4.64 metres Note: 1 m east of MW29A			15
5	- sandstone			
6				20
7				
8				25
9				
10				30
11				35
12				
13				40
14				45
15				49

TETRA TECH EBA

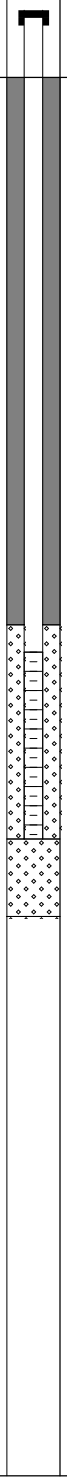
LOGGED BY: MC	COMPLETION DEPTH: 4.5 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW30A
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - gravelly, moist, dark brown		Pipe stickup = 0.72 metres	0
1	CLAY (TILL) - sandy, moist, firm, brown, iron, coal and silt inclusions			5
2	SAND - silty, coarse grained, moist, loose, light brown, white lenses			
	CLAY (TILL) - sandy, moist, firm, brown, iron, coal and silt inclusions			
3	- iron inclusions			10
4	- greyish blue, brown mottles			
5	SANDSTONE - dry, extremely weak, light grey			15
6	- medium grained, moist, dark grey			20
7				
8	- light brown - dry, dark grey			25
9	END OF BOREHOLE (9.00 metres) water - dry at 0 hrs. Monitoring well installed to 8.17 metres			30
10				
11				35
12				40
13				
14				45
15				49



TETRA TECH EBA

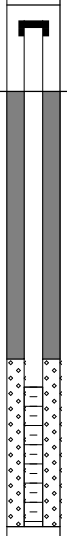
LOGGED BY: MC	COMPLETION DEPTH: 9 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW30B
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - gravelly, moist, dark brown		Pipe stickup = 0.76 metres	0
1	CLAY (TILL) - sandy, moist, firm, brown, iron, coal and silt inclusions			5
2	SAND - silty, coarse grained, moist, loose, light brown, white lenses			
	CLAY (TILL) - sandy, moist, firm, brown, iron, coal and silt inclusions			10
3	- iron inclusions			
4	- greyish blue, brown mottles			15
	END OF BOREHOLE (4.50 metres)			
5	water - dry at 0 hrs.			20
	Monitoring well installed to 4.67 metres			
6	Note: 1 m east of MW30A			
7				25
8				
9				30
10				
11				35
12				40
13				
14				45
15				49



TETRA TECH EBA

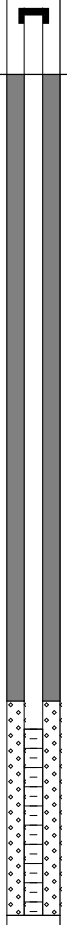
LOGGED BY: MC	COMPLETION DEPTH: 4.5 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW31A
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - gravelly, moist, dark brown, white and orange precipitates, (300 mm thick)		Pipe stickup = 0.71 metres	0
	SAND (TILL) - fine grained, dry, brown, white and red, coal and iron inclusions			
1	CLAY (TILL) - sandy, moist, soft, grey, iron inclusions			5
2	- bluish grey, brown mottles - dry			
	SANDSTONE - medium grained, dark grey clay inclusions throughout			10
3				
	- 200 mm thick sandstone layer - dry, light brown			15
4	- moist, dark grey, light grey and brown silt, shale and sand			
5				
6				20
	- bluish grey, dark brown inclusions			
7	- dark grey			25
8				
9				30
	END OF BOREHOLE (9.00 metres) water - dry at 0 hrs. Monitoring well installed to 9.02 metres			
10				35
11				
12				40
13				
14				45
15				49



TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 9 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW31B
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - gravelly, moist, dark brown, white and orange precipitates, (300 mm thick)		Pipe stickup = 0.72 metres	0
	SAND (TILL) - fine grained, dry, brown, white and red, coal and iron inclusions			
1	CLAY (TILL) - sandy, moist, soft, grey, iron inclusions			5
2	- bluish grey, brown mottles - dry			
	SANDSTONE - medium grained, dark grey clay inclusions throughout			10
3	END OF BOREHOLE (3.00 metres) water - 3.00 metres at 0 hrs. Monitoring well installed to 3.18 metres Note: 1 m west of MW31A			15
4				
5				20
6				
7				25
8				
9				30
10				
11				35
12				40
13				
14				45
15				49

TETRA TECH EBA

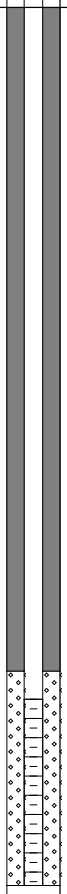
LOGGED BY: MC	COMPLETION DEPTH: 3 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW32A
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - sandy clay mix, bluish grey		Pipe stickup = 0.67 metres	0
1	CLAY (TILL) - sandy, moist, brown, iron inclusions			5
2	SAND - medium grained, dry, loose, light grey			
	CLAY (TILL) - sandy, moist, firm, medium plastic, dark grey			10
3	- loose, bluish grey			
4	SAND - medium grained, dry, light grey - grey, iron inclusions			15
5	CLAY - moist, firm, medium plastic, dark grey			
6	- dark brown			20
7	- sandy, soft, bluish grey, dark grey throughout			
8	- saturated			25
9	- moist			
	END OF BOREHOLE (9.00 metres) water - 8.04 metres at 0 hrs. Monitoring well installed to 9.42 metres			30
10				
11				35
12				40
13				
14				45
15				49



TETRA TECH EBA

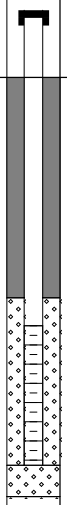
LOGGED BY: MC	COMPLETION DEPTH: 9 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW32B
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - sandy clay mix, bluish grey		Pipe stickup = 0.72 metres	0
1	CLAY (TILL) - sandy, moist, brown, iron inclusions			5
2	SAND - medium grained, dry, loose, light grey			10
3	CLAY (TILL) - sandy, moist, firm, medium plastic, dark grey - loose, bluish grey			15
4	SAND - medium grained, dry, light grey - grey, iron inclusions			20
5	END OF BOREHOLE (4.50 metres) water - 4.03 metres at 0 hrs. Monitoring well installed to 4.16 metres Note: 1 m east of MW32A			25
6				30
7				35
8				40
9				45
10				49
11				
12				
13				
14				
15				



TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 4.5 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW33A
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	SAND (FILL) - some pebbles and gravel, moist, loose, brown, (150 mm thick)		Pipe stickup = 0.94 metres	0
1	CLAY (TILL) - gravelly, some sand, subangular blocky, firm, medium plastic, dark grey, silt inclusions - massive, moist, very firm, high plastic, dark brown, coal, silt and iron inclusions			5
2	SAND - coarse grained, moist, loose, dark brown, iron inclusions - mottles - coarse grained, grey blue			10
3	- 200 mm thick clay layer - siltstone - saturated, silt mottled throughout			
4	SANDSTONE - fine grained, moist, grey blue, silt inclusions throughout			15
5				
6	- siltstone - saturated, water seam - grey, dark grey mottles			20
7	- moist			
8				25
9	- saturated, grey - medium grained, moist			
10	- wet - wet seam			30
11				35
12				40
13	- fractured bedrock, saturated, light grey			
14	END OF BOREHOLE (13.50 metres) water - 6.10 metres at 0 hrs. Monitoring well installed to 13.90 metres			45
15				49

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 13.5 m
REVIEWED BY: TD	COMPLETE: 14/10/06
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW33B
RYLEY, ALBERTA		

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

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

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	SAND (FILL) - some pebbles and gravel, moist, loose, brown, (150 mm thick)		Pipe stickup = 0.83 metres	0
1	CLAY (TILL) - gravelly, some sand, subangular blocky, firm, medium plastic, dark grey, silt inclusions - massive, moist, very firm, high plastic, dark brown, coal, silt and iron inclusions			5
2	SAND - coarse grained, moist, loose, dark brown, iron inclusions - mottles - coarse grained, grey blue			10
3	- 200 mm thick clay layer - siltstone - silt mottled throughout			15
4	SANDSTONE - fine grained, moist, grey blue, silt inclusions throughout			20
5	END OF BOREHOLE (4.50 metres) water - 0.93 metres at 0 hrs. Monitoring well installed to 4.68 metres Note: 1 m east of MW33A			25
6				30
7				35
8				40
9				45
10				49
11				
12				
13				
14				
15				

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 4.5 m
REVIEWED BY: TD	COMPLETE: 14/10/06
DRAWING NO:	Page 1 of 1

Clean Harbors Canada Inc.

Borehole No: **15MW34A**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	SPT (N)	Moisture Content (%)	SPT (N) 20 40 60 80 / Pocket Pen. (kPa) 100 200 300 400 / Plastic Limit – Moisture Content – Liquid Limit 20 40 60 80	Fracture Frequency (#/m) 2 4 6 8 / RQD (%) 40 60 80 100 / Recovery (%) 40 60 80 100	Depth (ft)
0								0
1	Solid stem auger	CLAY (FILL) - some silt, some fine to coarse gravel, trace of fine to medium cobbles, trace of fine boulders, damp, hard, non to low plastic, brown, coal and iron stained inclusions		12				2
2		CLAY (TILL) - some silt, trace of gravel, damp, firm, medium plastic, brown, coal and iron stained inclusions		14				4
		- some fine grained brown sand, low plastic, grey blue						6
3		- silty, soft, medium to high plastic, brown		13				8
		- firm						10
4		- silty, firm to very stiff, grey						12
5				71				14
		SANDSTONE - silty, clayey, fine to medium grained, damp to moist, extremely weak, grey						16
		- some silt, some clay, moist to wet						18
6		- wet, grey blue		98		>100		20
7		- silty, clayey, moist to wet, grey		/225mm				22
		CLAY SHALE - trace of fine grained sand, trace of fine gravel, damp, extremely weak, high plastic, grey						24
8								26
								28
9								30
								32
10								34
								36
11								38
		- dark greyish brown						40
12		- some fine grained sand, light grey						42
								44
13								46
		- no visible sand, dark grey						48
14								50
								52
15		END OF BOREHOLE (15.00 metres)						54
		slough - 14.25 metres						56
16		Monitoring well installed to 11.80 metres						58
								60
17								62
								64
18								
19								
20								

TETRA TECH EBA

Contractor: Clean Harbors	Completion Depth: 15 m
Drilling Rig Type:	Start Date: 2015 July 21
Logged By: TH	Completion Date: 2015 July 21
Reviewed By: SS	Page 1 of 1

Clean Harbors Canada Inc.

Borehole No: **15MW34B**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Moisture Content (%)	Pocket Pen. (kPa) / Plastic Limit / Moisture Content / Liquid Limit	Fracture Frequency (#/m) / RQD (%) / Recovery (%)	Depth (ft)
0					100 200 300 400 / 20 40 60 80	2 4 6 8 / 40 60 80 100 / 40 60 80 100	0
1	Solid stem auger	CLAY (FILL) - some silt, some fine to coarse gravel, trace of fine to medium cobbles, trace of fine boulders, damp, hard, non to low plastic, brown, coal and iron stained inclusions					2
2		CLAY (TILL) - some silt, trace of gravel, damp, firm, medium plastic, brown, coal and iron stained inclusions					4
3		- gleying - sand pockets - fine grained sand, damp, very slight gleying - soft, low to medium plastic					6
4		- silty, some fine grained brown sand, medium to high plastic, - firm to very stiff, grey					8
5		SANDSTONE - silty, clayey, fine to medium grained, damp to moist, grey					10
6		END OF BOREHOLE (5.00 metres) Monitoring well installed to 4.80 metres					12
7							14
8							16
9							18
10							20
11							22
12							24
13							26
14							28
15							30
16							32
17							34
18							36
19							38
20							40
							42
							44
							46
							48
							50
							52
							54
							56
							58
							60
							62
							64

0 hrs

0 hrs

TETRA TECH EBA

Contractor: Clean Harbors	Completion Depth: 5 m
Drilling Rig Type:	Start Date: 2015 July 21
Logged By: TH	Completion Date: 2015 July 21
Reviewed By: SS	Page 1 of 1

GEO/ROCK ZONE12.GPJ EBA.GDT 16/3/2

Clean Harbors Canada Inc.

Borehole No: **15MW35A/B/C**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description
0		CLAY (TILL) - sandy, plastic, brown
3		CLAY - trace of sand, high plastic, brown
4		SANDSTONE - weathered, fine grained, blue grey, intermittent clay shale laminations, mechanical fractures
5		- at 4.24 m, 50 mm thick siltstone bed
6		- at 4.94 m, 50 mm thick siltstone bed
8		CLAY SHALE - extremely weak, dark brown
8		- at 8.10 m, 50 mm thick coal seam
9		SANDSTONE - blue green, grey clay shale laminations
11	Wet Rotary/HQ Coring	- at 10.80 m, increasing clay content
12		CLAY SHALE - moist, strong, dark brown, fracturing at interface
13		- at 13.27 m, 1 mm thick tan siltstone lamination
15		- at 15.10 m, minor slickensides, some fracturing, intermittent seashells
16		- at 15.40 m, dark grey
16		- at 16.00 m, 40 mm thick bentonite seam
20		

Sample Type: 14

Sample Number: 1, 2, 3, 4, 5, 6, 7

SPT (N): 20 40 60 80

Moisture Content (%): Plastic Limit | Moisture Content | Liquid Limit (20 40 60 80)

Fracture Frequency (#/m): 2 4 6 8

RQD (%): 40 60 80 100

Recovery (%): 40 60 80 100

15MW35A | 15MW35B | 15MW35C

Elevation (m): 625 624 623 622 621 620 619 618 617 616 615 614 613 612 611 610 609 608 607 606 605

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 1 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW35A/B/C**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)	SPT (N) 20 40 60 80 / Plastic Limit Moisture Content Liquid Limit 20 40 60 80	Fracture Frequency (#/m) 2 4 6 8 / RQD (%) 40 60 80 100 / Recovery (%) 40 60 80 100	15MW35A	15MW35B	15MW35C	Elevation (m)
20												605
21		- at 21.20 m, increased fractures										604
22				8								603
23		- at 23.30 m, 100 mm thick tan siltstone bed										602
24												601
25												600
26				9								599
27												598
28		- at 27.50 m, intermittent 45-65° fractures										597
29				10								596
30	Wet Rotary/HQ Coring											595
31		SANDSTONE - fine grained, moist, strong, grey, coal laminations										594
32				11								593
33		- from 32.65 to 32.79 m, very fine grained sand, brown bed, 5 mm thick coal seam - at 33.30 m, intermittent siltstone										592
34		- at 34.06 m, 10 mm thick coal seam										591
35		- at 34.07 m, clay shale bed - at 34.15 m, dark grey clay shale laminations		12								590
36		- at 35.30 m, increasing clay content, dark brown - at 35.40 m, 20 mm thick coal seam MUDSTONE - very fine grained, friable, extremely weak, brown to light brownish grey										589
37												588
38				13								587
39		- light brownish grey, trace of coal fragments										586
40		- at 39.40 m, 10 mm thick clay layer - silty, wet, soft, sticky, high plastic, grey										585

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 2 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW35A/B/C**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)	SPT (N) 20 40 60 80 / Plastic Limit Moisture Content Liquid Limit 20 40 60 80	Fracture Frequency (#/m) 2 4 6 8 / RQD (%) 40 60 80 100 / Recovery (%) 40 60 80 100	15MW35A	15MW35B	15MW35C	Elevation (m)
40												585
41		SANDSTONE - glauconitic, very fine grained, extremely weak, light grey, coal fragments CLAY SHALE - strong, dark brown - at 41.00 m, 10 mm thick coal seam MUDSTONE - very fine grained, brittle, grey grey		14								584
42												583
43		END OF BOREHOLE (42.40 metres) Monitoring well A installed to 12.80 metres Monitoring well B installed to 7.01 metres Monitoring well C installed to 3.05 metres										582
44												581
45												580
46												579
47												578
48												577
49												576
50												575
51												574
52												573
53												572
54												571
55												570
56												569
57												568
58												567
59												566
60												565

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 3 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW35Deep**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)
0		CLAY (TILL) - sandy, plastic, brown			14	
1						
2		CLAY - trace of sand, high plastic, brown				
3		SANDSTONE - weathered, fine grained, blue grey, intermittent clay shale laminations, mechanical fractures		1		
4						
		- at 4.24 m, 50 mm thick siltstone bed				
5		- at 4.94 m, 50 mm thick siltstone bed				
6						
7						
		CLAY SHALE - strong, dark brown		2		
8		- at 8.10 m, 50 mm thick coal seam				
		SANDSTONE - blue green, grey clay shale laminations				
9						
10				3		
11		- at 10.80 m, increasing clay content				
		CLAY SHALE - moist, strong, dark brown, fracturing at interface		4		
12						
13						
		- at 13.27 m, 1 mm thick tan siltstone lamination		5		
14						
15						
		- at 15.10 m, minor slickensides, some fracturing, intermittent seashells				
16		- at 15.40 m, dark grey				
		- at 16.00 m, 40 mm thick bentonite seam		6		
17						
18						
19						
20				7		

Wet Rotary/HQ Coring

SPT (N) 20 40 60 80

Plastic Limit | Moisture Content | Liquid Limit

20 40 60 80

Fracture Frequency (#/m) 2 4 6 8

RQD (%) 40 60 80 100

Recovery (%) 40 60 80 100

15MW35

Elevation (m): 625, 624, 623, 622, 621, 620, 619, 618, 617, 616, 615, 614, 613, 612, 611, 610, 609, 608, 607, 606, 605

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 1 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW35Deep**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)	SPT (N) 20 40 60 80 / Plastic Limit – Moisture Content – Liquid Limit 20 40 60 80	Fracture Frequency (#/m) 2 4 6 8 / RQD (%) 40 60 80 100 / Recovery (%) 40 60 80 100	15MW35	Elevation (m)
20										605
21		- at 21.20 m, increased fractures								604
22				8						603
23		- at 23.30 m, 100 mm thick tan siltstone bed								602
24										601
25				9						600
26										599
27		- at 27.50 m, intermittent 45-65° fractures								598
28				10						597
29										596
30	Wet Rotary/HQ Coring	SANDSTONE - fine grained, moist, strong, grey, coal laminations								595
31				11						594
32										593
33		- from 32.65 to 32.79 m, very fine grained sand, brown bed, 5 mm thick coal seam - at 33.30 m, intermittent siltstone								592
34		- at 34.06 m, 10 mm thick coal seam		12						591
35		- at 34.07 m, clay shale bed - at 34.15 m, dark grey clay shale laminations								590
36		- at 35.30 m, increasing clay content, dark brown - at 35.40 m, 20 mm thick coal seam MUDSTONE - very fine grained, friable, extremely weak, brown to light brownish grey								589
37				13						588
38										587
39		- light brownish grey, trace of coal fragments								586
40		- at 39.40 m, 10 mm thick clay layer - silty, wet, soft, sticky, high plastic, grey								585

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 2 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW35Deep**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)	SPT (N) 20 40 60 80 / Plastic Limit Moisture Content Liquid Limit 20 40 60 80	Fracture Frequency (#/m) 2 4 6 8 / RQD (%) 40 60 80 100 / Recovery (%) 40 60 80 100	15MW35	Elevation (m)
40										585
		SANDSTONE - glauconitic, very fine grained, extremely weak, light grey, coal fragments		14						
41		CLAY SHALE - strong, dark brown - at 41.00 m, 10 mm thick coal seam								584
42		MUDSTONE - very fine grained, brittle, grey grey								583
		END OF BOREHOLE (42.40 metres) Monitoring well installed to 32.77 metres								
43										582
44										581
45										580
46										579
47										578
48										577
49										576
50										575
51										574
52										573
53										572
54										571
55										570
56										569
57										568
58										567
59										566
60										565

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 3 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW36A/Deep**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)
0		CLAY (TILL) - some silt, moist, plastic, brown			24	
2		SAND - clayey, moist, brown				
3		SANDSTONE - medium grained, blue grey, clay shale interbeds				
5		CLAY SHALE - moist, strong, dark grey, mechanical fractures		1		
7		SANDSTONE - medium grained, strong, light grey, laminated clay shale throughout, mechanical fractures		2		
9	Wet Rotary/HQ Coring	CLAY SHALE - moist, strong, dark grey, mechanical fractures		3		
12		- at 1.220 mm, 200 mm thick siltstone layer - very fine grained, weak, light brown, mechanical fractures				
13		- at 12.80 m, 20 mm thick seashell layer		4		
15		- at 14.70 m, 10 mm thick bentonite lens				
16				5	19	
17		- at 17.00 m, intermittent shells throughout				
18				6		
19		- at 19.00 m, periodic 45-65° fractures				
20						

SPT (N) ■ 20 40 60 80

Plastic Limit — Moisture Content — Liquid Limit 20 40 60 80

● Fracture Frequency (#/m) ● 2 4 6 8

▲ RQD (%) ▲ 40 60 80 100

■ Recovery (%) ■ 40 60 80 100

15MW36 | 15MW36A | Depth (ft) 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 38.8 m
Drilling Rig Type:	Start Date: 2015 July 21
Logged By: BS	Completion Date: 2015 July 21
Reviewed By: TH	Page 1 of 2

Clean Harbors Canada Inc.

Borehole No: **15MW36A/Deep**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)
20				7		
21	Wet Rotary/HQ Coring	- slight slickensides				
22				8		
23						
24		- at 24.13 m, 10 mm thick coal seam				
25				9		
26						
27						
28				10		
29		- from 28.90 to 29.20 m, transition to siltstone - very fine grained, light grey, coal inclusions - at 29.20 m, strong, light grey		11		
30						
31						
32		SANDSTONE - fine to medium grained, strong, grey - at 32.23 m, clay shale laminations, 20 mm thick clay shale bed		12		
33		SILTSTONE - clay shale interbeds				
34		SANDSTONE - fine grained, light grey, coal laminations - at 33.40 m, coal laminations at 140 mm intervals - at 33.80 m, coal laminations at 500 mm intervals		13		
35		- at 34.29 m, medium grained interbeds with light brown staining - at 34.76 m, coal inclusion				
36		- from 35.16 to 35.41 m, intermitted sandstone at 250 mm intervals - medium grained, light brown staining, coal inclusions, hydrocarbon odour				
37		- from 35.76 to 36.06 m, 300 mm thick sandstone layer - medium grained, coal inclusions, hydrocarbon odour - at 37.00 m, fine grained, intermittent light staining		14		
38		CLAY SHALE - strong, dark grey				
39		END OF BOREHOLE (38.80 metres) Monitoring well installed to 35.36 metres Monitoring well A installed to 14.33 metres				
40						

SPT (N) ■ 20 40 60 80

Plastic Limit — Moisture Content — Liquid Limit 20 40 60 80

● Fracture Frequency (#/m) ● 2 4 6 8

▲ RQD (%) ▲ 40 60 80 100

■ Recovery (%) ■ 40 60 80 100

15MW36 | 15MW36A

Depth (ft): 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 102 104 106 108 110 112 114 116 118 120 122 124 126 128 130

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 38.8 m
Drilling Rig Type:	Start Date: 2015 July 21
Logged By: BS	Completion Date: 2015 July 21
Reviewed By: TH	Page 2 of 2

GEO/ROCK ZONE12.GPJ EBA.GDT 16/3/2

APPENDIX D

LABORATYRY ANALYTICAL REPORTS

Your Project #: 704-SWM.SWOP03652-01

Attention:Michele Crawford

TETRA TECH CANADA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: 523760-01-01, 523760-02-01, 523760-03-01, 523760-04-01, 523760-05-01, 523760-06-01

Report Date: 2017/06/12
Report #: R2395642
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B743380
Received: 2017/06/01, 18:09

Sample Matrix: Water
Samples Received: 28

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	28	N/A	2017/06/06	AB SOP-00005	SM 22 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	27	N/A	2017/06/04	AB SOP-00039	CCME CWS/EPA 8260C m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2017/06/06	AB SOP-00039	CCME CWS/EPA 8260C m
Cadmium - low level CCME - Dissolved	28	N/A	2017/06/08	AB WI-00065	Auto Calc
Chloride by Automated Colourimetry	22	N/A	2017/06/07	AB SOP-00020	SM 22 4500-Cl E m
Chloride by Automated Colourimetry	6	N/A	2017/06/08	AB SOP-00020	SM 22 4500-Cl E m
Chemical Oxygen Demand	13	N/A	2017/06/05	AB SOP-00016	SM 22 5220D m
Chemical Oxygen Demand	15	N/A	2017/06/06	AB SOP-00016	SM 22 5220D m
Carbon (DOC) (1)	28	N/A	2017/06/09	EENVSOP-00060	MMCW 119 1996 m
Conductivity @25C	28	N/A	2017/06/06	AB SOP-00005	SM 22 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	1	2017/06/03	2017/06/03	AB SOP-00040 / AB SOP-00037	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	2	2017/06/03	2017/06/04	AB SOP-00040 / AB SOP-00037	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	20	2017/06/04	2017/06/05	AB SOP-00040 / AB SOP-00037	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	4	2017/06/05	2017/06/06	AB SOP-00040 / AB SOP-00037	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	1	2017/06/06	2017/06/07	AB SOP-00040 / AB SOP-00037	CCME PHC-CWS m
Hardness	8	N/A	2017/06/08	AB WI-00065	Auto Calc
Hardness	20	N/A	2017/06/09	AB WI-00065	Auto Calc
Mercury - Low Level (Dissolved) (3)	28	2017/06/08	2017/06/09	EENVSOP-00031	EPA 1631E/245.1 R3 m
Elements by ICP - Dissolved (3)	20	N/A	2017/06/07	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICP - Dissolved (3)	2	N/A	2017/06/08	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICP - Dissolved (3)	6	N/A	2017/06/09	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICPMS - Dissolved (3)	28	N/A	2017/06/07	AB SOP-00043	EPA 200.8 R5.4 m
Ion Balance	3	N/A	2017/06/04	AB WI-00065	Auto Calc

Your Project #: 704-SWM.SWOP03652-01

Attention:Michele Crawford

TETRA TECH CANADA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: 523760-01-01, 523760-02-01, 523760-03-01, 523760-04-01, 523760-05-01, 523760-06-01

Report Date: 2017/06/12
Report #: R2395642
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B743380
Received: 2017/06/01, 18:09

Sample Matrix: Water
Samples Received: 28

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Ion Balance	24	N/A	2017/06/05	AB WI-00065	Auto Calc
Ion Balance	1	N/A	2017/06/06	AB WI-00065	Auto Calc
Sum of cations, anions	8	N/A	2017/06/08	AB WI-00065	Auto Calc
Sum of cations, anions	20	N/A	2017/06/09	AB WI-00065	Auto Calc
Ammonia-N (Total)	4	N/A	2017/06/08	AB SOP-00007	EPA 350.1 R2.0 m
Ammonia-N (Total)	5	N/A	2017/06/09	AB SOP-00007	EPA 350.1 R2.0 m
Ammonia-N (Total)	19	N/A	2017/06/12	AB SOP-00007	EPA 350.1 R2.0 m
Nitrate and Nitrite	15	N/A	2017/06/08	AB WI-00065	Auto Calc
Nitrate and Nitrite	13	N/A	2017/06/09	AB WI-00065	Auto Calc
Nitrate + Nitrite-N (calculated)	15	N/A	2017/06/08	AB WI-00065	Auto Calc
Nitrate + Nitrite-N (calculated)	13	N/A	2017/06/09	AB WI-00065	Auto Calc
Nitrogen (Nitrite - Nitrate) by IC	20	N/A	2017/06/08	AB SOP-00023	SM 22 4110 B m
Nitrogen (Nitrite - Nitrate) by IC	8	N/A	2017/06/09	AB SOP-00023	SM 22 4110 B m
Benzo[a]pyrene Equivalency (4)	3	N/A	2017/06/06	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	3	2017/06/03	2017/06/04	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270D m
pH @25°C (5)	28	N/A	2017/06/06	AB SOP-00005	SM 22 4500 H+ B m
Sulphate by Automated Colourimetry	22	N/A	2017/06/07	AB SOP-00018	SM 22 4500-SO4 E m
Sulphate by Automated Colourimetry	6	N/A	2017/06/08	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Calculated)	8	N/A	2017/06/08	AB WI-00065	Auto Calc
Total Dissolved Solids (Calculated)	20	N/A	2017/06/09	AB WI-00065	Auto Calc
Total Kjeldahl Nitrogen	18	2017/06/07	2017/06/08	AB SOP-00008	EPA 351.1 R 1978 m
Total Kjeldahl Nitrogen	9	2017/06/08	2017/06/08	AB SOP-00008	EPA 351.1 R 1978 m
Total Kjeldahl Nitrogen	1	2017/06/08	2017/06/09	AB SOP-00008	EPA 351.1 R 1978 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted,

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Your Project #: 704-SWM.SWOP03652-01

Attention:Michele Crawford

TETRA TECH CANADA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: 523760-01-01, 523760-02-01, 523760-03-01, 523760-04-01, 523760-05-01, 523760-06-01

Report Date: 2017/06/12
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procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

(1) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: Whenever applicable, Dissolved >Total for any parameter that falls within method uncertainty for duplicates is likely equivalent. If RPD is >20% samples were reanalyzed and confirmed.
(2) Silica gel clean up employed.
(3) Dissolved > Total Imbalance: Whenever applicable, Dissolved >Total for any parameter that falls within method uncertainty for duplicates is likely equivalent. If RPD is >20% samples were reanalyzed and confirmed.
(4) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Maxxam endeavours to analyze samples as soon as possible after receipt.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ioana Stoica, Project Manager
Email: IStoica@maxxam.ca
Phone# (403)735-2227

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

Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RE9030	RE9031	RE9039	RE9040	RE9041	RE9042		
Sampling Date		2017/06/01 15:25	2017/06/01 15:35	2017/06/01 16:00	2017/06/01 15:05	2017/06/01 15:15	2017/06/01 10:50		
COC Number		523760-01-01	523760-01-01	523760-02-01	523760-02-01	523760-02-01	523760-02-01		
	UNITS	MW-18A	MW-18B	MW-1C	MW-19A	MW-19B	MW-20B	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	8651120
Volatiles									
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8651260
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8651260
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8651260
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	8651260
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8651260
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	8651260
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	8651260
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	8651260
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	98	99	98	97	98	97	N/A	8651260
4-Bromofluorobenzene (sur.)	%	104	105	107	107	107	107	N/A	8651260
D4-1,2-Dichloroethane (sur.)	%	103	102	109	107	104	105	N/A	8651260
O-TERPHENYL (sur.)	%	97	100	95	95	95	94	N/A	8651120

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RE9043	RE9044	RE9045	RE9046		RE9047		
Sampling Date		2017/06/01 11:00	2017/06/01 10:10	2017/06/01 10:20	2017/06/01 09:45		2017/06/01 10:00		
COC Number		523760-03-01	523760-03-01	523760-03-01	523760-03-01		523760-03-01		
	UNITS	MW-21B	MW-22A	MW-22B	MW-23A	QC Batch	MW-23B	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	8651120	<0.10	0.10	8651120
Volatiles									
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	8651260	<0.00040	0.00040	8651684
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	8651260	<0.00040	0.00040	8651684
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	8651260	<0.00040	0.00040	8651684
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	8651260	<0.00080	0.00080	8651684
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	8651260	<0.00040	0.00040	8651684
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	8651260	<0.00080	0.00080	8651684
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	8651260	<0.10	0.10	8651684
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	8651260	<0.10	0.10	8651684
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	97	98	96	97	8651260	100	N/A	8651684
4-Bromofluorobenzene (sur.)	%	106	106	107	106	8651260	106	N/A	8651684
D4-1,2-Dichloroethane (sur.)	%	106	103	105	105	8651260	103	N/A	8651684
O-TERPHENYL (sur.)	%	94	96	95	104	8651120	96	N/A	8651120

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RE9048	RE9049		RE9050		RE9051		
Sampling Date		2017/06/01 11:20	2017/06/01 11:40		2017/06/01 12:10		2017/06/01 12:00		
COC Number		523760-03-01	523760-03-01		523760-04-01		523760-04-01		
	UNITS	MW-25B	MW-26B	QC Batch	MW-27A	QC Batch	MW-27B	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	8651106	<0.10	8651120	<0.10	0.10	8651106
Volatiles									
Benzene	mg/L	<0.00040	<0.00040	8651684	<0.00040	8651684	<0.00040	0.00040	8651684
Toluene	mg/L	<0.00040	<0.00040	8651684	<0.00040	8651684	<0.00040	0.00040	8651684
Ethylbenzene	mg/L	<0.00040	<0.00040	8651684	<0.00040	8651684	<0.00040	0.00040	8651684
m & p-Xylene	mg/L	<0.00080	<0.00080	8651684	<0.00080	8651684	<0.00080	0.00080	8651684
o-Xylene	mg/L	<0.00040	<0.00040	8651684	<0.00040	8651684	<0.00040	0.00040	8651684
Xylenes (Total)	mg/L	<0.00080	<0.00080	8651684	<0.00080	8651684	<0.00080	0.00080	8651684
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	8651684	<0.10	8651684	<0.10	0.10	8651684
F1 (C6-C10)	mg/L	<0.10	<0.10	8651684	<0.10	8651684	<0.10	0.10	8651684
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	99	8651684	98	8651684	102	N/A	8651684
4-Bromofluorobenzene (sur.)	%	106	107	8651684	105	8651684	106	N/A	8651684
D4-1,2-Dichloroethane (sur.)	%	103	103	8651684	104	8651684	102	N/A	8651684
O-TERPHENYL (sur.)	%	92	95	8651106	96	8651120	94	N/A	8651106

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RE9052	RE9053	RE9054	RE9055	RE9056	RE9057		
Sampling Date		2017/06/01 12:35	2017/06/01 12:45	2017/06/01 13:15	2017/06/01 13:30	2017/06/01 13:35	2017/06/01 13:45		
COC Number		523760-04-01	523760-04-01	523760-04-01	523760-04-01	523760-04-01	523760-04-01		
	UNITS	MW-28A	MW-28B	MW-29A	MW-29B	MW-30A	MW-30B	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	8651120
Volatiles									
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8651684
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8651684
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8651684
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	8651684
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8651684
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	8651684
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	8651684
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	8651684
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	103	99	101	98	98	100	N/A	8651684
4-Bromofluorobenzene (sur.)	%	106	106	106	105	108	107	N/A	8651684
D4-1,2-Dichloroethane (sur.)	%	103	102	101	104	107	102	N/A	8651684
O-TERPHENYL (sur.)	%	105	93	96	96	96	96	N/A	8651120

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B743380
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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RE9058	RE9059		RE9060		RE9061		
Sampling Date		2017/06/01 14:45	2017/06/01 14:20		2017/06/01 14:30		2017/06/01 09:30		
COC Number		523760-04-01	523760-05-01		523760-05-01		523760-05-01		
	UNITS	MW-31B	MW-32A	QC Batch	MW-32B	QC Batch	MW-35B	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	8651120	<0.10	8651126	<0.10	0.10	8651126
Volatiles									
Benzene	mg/L	<0.00040	<0.00040	8651684	<0.00040	8651684	<0.00040	0.00040	8653708
Toluene	mg/L	<0.00040	<0.00040	8651684	<0.00040	8651684	<0.00040	0.00040	8653708
Ethylbenzene	mg/L	<0.00040	<0.00040	8651684	<0.00040	8651684	<0.00040	0.00040	8653708
m & p-Xylene	mg/L	<0.00080	<0.00080	8651684	<0.00080	8651684	<0.00080	0.00080	8653708
o-Xylene	mg/L	<0.00040	<0.00040	8651684	<0.00040	8651684	<0.00040	0.00040	8653708
Xylenes (Total)	mg/L	<0.00080	<0.00080	8651684	<0.00080	8651684	<0.00080	0.00080	8653708
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	8651684	<0.10	8651684	<0.10	0.10	8653708
F1 (C6-C10)	mg/L	<0.10	<0.10	8651684	<0.10	8651684	<0.10	0.10	8653708
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	99	100	8651684	101	8651684	99	N/A	8653708
4-Bromofluorobenzene (sur.)	%	106	106	8651684	105	8651684	96	N/A	8653708
D4-1,2-Dichloroethane (sur.)	%	103	104	8651684	102	8651684	97	N/A	8653708
O-TERPHENYL (sur.)	%	95	94	8651120	91	8651126	91	N/A	8651126

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RE9062	RE9063		RE9064		
Sampling Date		2017/06/01	2017/06/01		2017/06/01		
COC Number		523760-06-01	523760-06-01		523760-06-01		
	UNITS	17DUPLICATE 1	17DUPLICATE 2	QC Batch	17DUPLICATE 3	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	8651126	<0.10	0.10	8651126
Volatiles							
Benzene	mg/L	<0.00040	<0.00040	8651684	<0.00040	0.00040	8651256
Toluene	mg/L	<0.00040	<0.00040	8651684	<0.00040	0.00040	8651256
Ethylbenzene	mg/L	<0.00040	<0.00040	8651684	<0.00040	0.00040	8651256
m & p-Xylene	mg/L	<0.00080	<0.00080	8651684	<0.00080	0.00080	8651256
o-Xylene	mg/L	<0.00040	<0.00040	8651684	<0.00040	0.00040	8651256
Xylenes (Total)	mg/L	<0.00080	<0.00080	8651684	<0.00080	0.00080	8651256
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	8651684	<0.10	0.10	8651256
F1 (C6-C10)	mg/L	<0.10	<0.10	8651684	<0.10	0.10	8651256
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	96	98	8651684	95	N/A	8651256
4-Bromofluorobenzene (sur.)	%	106	106	8651684	97	N/A	8651256
D4-1,2-Dichloroethane (sur.)	%	106	106	8651684	116	N/A	8651256
O-TERPHENYL (sur.)	%	93	105	8651126	91	N/A	8651126

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9030		RE9031		RE9039	RE9040		
Sampling Date		2017/06/01 15:25		2017/06/01 15:35		2017/06/01 16:00	2017/06/01 15:05		
COC Number		523760-01-01		523760-01-01		523760-02-01	523760-02-01		
	UNITS	MW-18A	RDL	MW-18B	RDL	MW-1C	MW-19A	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	17	N/A	35	N/A	67	77	N/A	8650956
Cation Sum	meq/L	17	N/A	36	N/A	72	81	N/A	8650956
Hardness (CaCO3)	mg/L	8.4	0.50	660	0.50	530	270	0.50	8650954
Ion Balance (% Difference)	%	0.86	N/A	1.8	N/A	3.8	2.2	N/A	8650955
Dissolved Nitrate (NO3)	mg/L	<0.044	0.044	0.36	0.044	0.41	0.16	0.044	8650872
Nitrate plus Nitrite (N)	mg/L	<0.010	0.010	0.092	0.010	0.18	0.12	0.010	8650873
Dissolved Nitrite (NO2)	mg/L	<0.033	0.033	0.037	0.033	0.28	0.28	0.033	8650872
Calculated Total Dissolved Solids	mg/L	910	10	2200	10	4600	5200	10	8650958
Misc. Inorganics									
Conductivity	uS/cm	1500	1.0	3000	1.0	6100	6900	1.0	8653243
pH	pH	8.50	N/A	8.05	N/A	8.23	8.31	N/A	8653215
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	0.020	<0.020	0.020	<0.020	<0.020	0.020	8651027
Anions									
Alkalinity (PP as CaCO3)	mg/L	15	0.50	<0.50	0.50	<0.50	<0.50	0.50	8653242
Alkalinity (Total as CaCO3)	mg/L	850	0.50	620	0.50	620	970	0.50	8653242
Bicarbonate (HCO3)	mg/L	1000	0.50	760	0.50	760	1200	0.50	8653242
Carbonate (CO3)	mg/L	17	0.50	<0.50	0.50	<0.50	<0.50	0.50	8653242
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	<0.50	0.50	8653242
Dissolved Sulphate (SO4)	mg/L	2.1	1.0	1100 (1)	10	2600 (1)	2800 (1)	25	8652850
Dissolved Chloride (Cl)	mg/L	7.3	1.0	29	1.0	<1.0	7.4	1.0	8652846
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	0.010	0.011	0.010	0.086	0.085	0.010	8651679
Dissolved Nitrate (N)	mg/L	<0.010	0.010	0.080	0.010	0.093	0.037	0.010	8651679
Elements									
Dissolved Aluminum (Al)	mg/L	0.0045	0.0030	0.0062	0.0030	0.0069	<0.0030	0.0030	8654128
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	<0.00060	0.00060	<0.00060	<0.00060	0.00060	8654128
Dissolved Arsenic (As)	mg/L	0.0010	0.00020	0.00037	0.00020	0.00068	0.00054	0.00020	8654128
Dissolved Barium (Ba)	mg/L	0.10	0.010	0.016	0.010	<0.10	<0.10	0.10	8655691
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	8654128
Dissolved Boron (B)	mg/L	0.83	0.020	0.062	0.020	0.24	0.43	0.20	8655691

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9030		RE9031		RE9039	RE9040		
Sampling Date		2017/06/01 15:25		2017/06/01 15:35		2017/06/01 16:00	2017/06/01 15:05		
COC Number		523760-01-01		523760-01-01		523760-02-01	523760-02-01		
	UNITS	MW-18A	RDL	MW-18B	RDL	MW-1C	MW-19A	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	2.9	0.30	180	0.30	150	57	3.0	8655691
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	8654128
Dissolved Cobalt (Co)	mg/L	<0.00030	0.00030	0.00039	0.00030	0.00067	0.00043	0.00030	8654128
Dissolved Copper (Cu)	mg/L	0.00038	0.00020	0.00064	0.00020	0.00039	0.00041	0.00020	8654128
Dissolved Iron (Fe)	mg/L	<0.060	0.060	<0.060	0.060	<0.60	<0.60	0.60	8655691
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	<0.00020	0.00020	<0.00020	<0.00020	0.00020	8654128
Dissolved Lithium (Li)	mg/L	0.076	0.020	0.15	0.020	0.35	0.55	0.20	8655691
Dissolved Magnesium (Mg)	mg/L	0.31	0.20	48	0.20	38	32	2.0	8655691
Dissolved Manganese (Mn)	mg/L	0.040	0.0040	0.15	0.0040	0.28	0.40	0.040	8655691
Dissolved Molybdenum (Mo)	mg/L	0.0043	0.00020	0.00066	0.00020	0.00068	0.0016	0.00020	8654128
Dissolved Nickel (Ni)	mg/L	0.0024	0.00050	0.0040	0.00050	0.0013	0.0017	0.00050	8654128
Dissolved Phosphorus (P)	mg/L	0.11	0.10	<0.10	0.10	<1.0	<1.0	1.0	8655691
Dissolved Potassium (K)	mg/L	1.4	0.30	4.4	0.30	7.1	8.6	3.0	8655691
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	<0.00020	0.00020	<0.00020	<0.00020	0.00020	8654128
Dissolved Silicon (Si)	mg/L	3.5	0.10	4.9	0.10	4.2	4.4	1.0	8655691
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	<0.00010	0.00010	<0.00010	<0.00010	0.00010	8654128
Dissolved Sodium (Na)	mg/L	380	0.50	530 (1)	5.0	1400	1700	5.0	8655691
Dissolved Strontium (Sr)	mg/L	0.068	0.020	1.7	0.020	2.6	1.5	0.20	8655691
Dissolved Sulphur (S)	mg/L	0.32	0.20	360	0.20	960	980	2.0	8655691
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	<0.00020	0.00020	<0.00020	<0.00020	0.00020	8654128
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	8654128
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	8654128
Dissolved Uranium (U)	mg/L	0.00026	0.00010	0.0044	0.00010	0.00022	0.0060	0.00010	8654128
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	8654128
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	<0.0030	0.0030	<0.0030	<0.0030	0.0030	8654128

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

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9041	RE9042			RE9043		
Sampling Date		2017/06/01 15:15	2017/06/01 10:50			2017/06/01 11:00		
COC Number		523760-02-01	523760-02-01			523760-03-01		
	UNITS	MW-19B	MW-20B	RDL	QC Batch	MW-21B	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	61	55	N/A	8650956	29	N/A	8650956
Cation Sum	meq/L	65	60	N/A	8650956	29	N/A	8650956
Hardness (CaCO3)	mg/L	150	570	0.50	8650954	64	0.50	8650954
Ion Balance (% Difference)	%	3.6	4.5	N/A	8650955	0.56	N/A	8650955
Dissolved Nitrate (NO3)	mg/L	<0.044	0.86	0.044	8650872	0.19	0.044	8650872
Nitrate plus Nitrite (N)	mg/L	0.032	0.19	0.010	8650873	0.042	0.010	8650873
Dissolved Nitrite (NO2)	mg/L	0.11	<0.033	0.033	8650872	<0.033	0.033	8650872
Calculated Total Dissolved Solids	mg/L	4100	3700	10	8650958	1800	10	8650958
Misc. Inorganics								
Conductivity	uS/cm	5800	5000	1.0	8653243	2600	1.0	8653243
pH	pH	8.50	8.17	N/A	8653215	8.39	N/A	8653215
Low Level Elements								
Dissolved Cadmium (Cd)	ug/L	<0.020	<0.020	0.020	8651027	<0.020	0.020	8651027
Anions								
Alkalinity (PP as CaCO3)	mg/L	18	<0.50	0.50	8653242	7.6	0.50	8653242
Alkalinity (Total as CaCO3)	mg/L	910	790	0.50	8653242	860	0.50	8653242
Bicarbonate (HCO3)	mg/L	1100	960	0.50	8653242	1000	0.50	8653242
Carbonate (CO3)	mg/L	22	<0.50	0.50	8653242	9.2	0.50	8653242
Hydroxide (OH)	mg/L	<0.50	<0.50	0.50	8653242	<0.50	0.50	8653242
Dissolved Sulphate (SO4)	mg/L	2000 (1)	1900 (1)	25	8652850	570 (1)	5.0	8652859
Dissolved Chloride (Cl)	mg/L	2.7	1.1	1.0	8652846	1.1	1.0	8652855
Nutrients								
Dissolved Nitrite (N)	mg/L	0.032	<0.010	0.010	8651679	<0.010	0.010	8651679
Dissolved Nitrate (N)	mg/L	<0.010	0.19	0.010	8651679	0.042	0.010	8651679
Elements								
Dissolved Aluminum (Al)	mg/L	0.0034	0.0041	0.0030	8654128	0.0035	0.0030	8654128
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	0.00060	8654128	<0.00060	0.00060	8654128
Dissolved Arsenic (As)	mg/L	0.0017	0.00032	0.00020	8654128	0.00064	0.00020	8654128
Dissolved Barium (Ba)	mg/L	<0.10	<0.10	0.10	8655691	<0.010	0.010	8655691
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128
Dissolved Boron (B)	mg/L	0.52	0.35	0.20	8655691	0.23	0.020	8655691

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9041	RE9042			RE9043		
Sampling Date		2017/06/01 15:15	2017/06/01 10:50			2017/06/01 11:00		
COC Number		523760-02-01	523760-02-01			523760-03-01		
	UNITS	MW-19B	MW-20B	RDL	QC Batch	MW-21B	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	29	140	3.0	8655691	17	0.30	8655691
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0011	0.0010	8654128	<0.0010	0.0010	8654128
Dissolved Cobalt (Co)	mg/L	<0.00030	<0.00030	0.00030	8654128	<0.00030	0.00030	8654128
Dissolved Copper (Cu)	mg/L	<0.00020	0.00059	0.00020	8654128	0.00033	0.00020	8654128
Dissolved Iron (Fe)	mg/L	<0.60	<0.60	0.60	8655691	<0.060	0.060	8655691
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	0.00020	8654128	0.00034	0.00020	8654128
Dissolved Lithium (Li)	mg/L	0.55	0.54	0.20	8655691	0.26	0.020	8655691
Dissolved Magnesium (Mg)	mg/L	18	50	2.0	8655691	5.3	0.20	8655691
Dissolved Manganese (Mn)	mg/L	0.19	<0.040	0.040	8655691	0.0041	0.0040	8655691
Dissolved Molybdenum (Mo)	mg/L	0.0016	0.00078	0.00020	8654128	0.0018	0.00020	8654128
Dissolved Nickel (Ni)	mg/L	<0.00050	0.00067	0.00050	8654128	0.00086	0.00050	8654128
Dissolved Phosphorus (P)	mg/L	<1.0	<1.0	1.0	8655691	<0.10	0.10	8655691
Dissolved Potassium (K)	mg/L	7.5	9.8	3.0	8655691	4.1	0.30	8655691
Dissolved Selenium (Se)	mg/L	<0.00020	0.013	0.00020	8654128	<0.00020	0.00020	8654128
Dissolved Silicon (Si)	mg/L	4.7	4.7	1.0	8655691	3.9	0.10	8655691
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	0.00010	8654128	<0.00010	0.00010	8654128
Dissolved Sodium (Na)	mg/L	1400	1100	5.0	8655691	640 (1)	5.0	8655691
Dissolved Strontium (Sr)	mg/L	1.2	2.2	0.20	8655691	0.30	0.020	8655691
Dissolved Sulphur (S)	mg/L	750	680	2.0	8655691	190	0.20	8655691
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	0.00020	8654128	<0.00020	0.00020	8654128
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128
Dissolved Uranium (U)	mg/L	0.00024	0.0050	0.00010	8654128	0.0017	0.00010	8654128
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128
Dissolved Zinc (Zn)	mg/L	<0.0030	<0.0030	0.0030	8654128	<0.0030	0.0030	8654128

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

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9044		RE9045		RE9046		RE9047		
Sampling Date		2017/06/01 10:10		2017/06/01 10:20		2017/06/01 09:45		2017/06/01 10:00		
COC Number		523760-03-01		523760-03-01		523760-03-01		523760-03-01		
	UNITS	MW-22A	RDL	MW-22B	RDL	MW-23A	RDL	MW-23B	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	57	N/A	88	N/A	25	N/A	120	N/A	8650956
Cation Sum	meq/L	59	N/A	96	N/A	25	N/A	120	N/A	8650956
Hardness (CaCO3)	mg/L	110	0.50	490	0.50	13	0.50	690	0.50	8650954
Ion Balance (% Difference)	%	1.2	N/A	4.0	N/A	0.52	N/A	1.3	N/A	8650955
Dissolved Nitrate (NO3)	mg/L	70	0.089	0.38	0.22	<0.044	0.044	0.85	0.22	8650872
Nitrate plus Nitrite (N)	mg/L	16	0.020	0.086	0.050	<0.010	0.010	0.19	0.050	8650873
Dissolved Nitrite (NO2)	mg/L	<0.033	0.033	<0.16	0.16	<0.033	0.033	<0.16	0.16	8650872
Calculated Total Dissolved Solids	mg/L	3800	10	6000	10	1300	10	7900	10	8650958
Misc. Inorganics										
Conductivity	uS/cm	5200	1.0	8000	1.0	2100	1.0	10000	1.0	8653243
pH	pH	8.33	N/A	8.23	N/A	8.75	N/A	8.05	N/A	8653215
Low Level Elements										
Dissolved Cadmium (Cd)	ug/L	0.058	0.020	<0.020	0.020	<0.020	0.020	0.047	0.020	8651027
Anions										
Alkalinity (PP as CaCO3)	mg/L	2.0	0.50	<0.50	0.50	45	0.50	<0.50	0.50	8653242
Alkalinity (Total as CaCO3)	mg/L	780	0.50	1000	0.50	1100	0.50	870	0.50	8653242
Bicarbonate (HCO3)	mg/L	950	0.50	1200	0.50	1300	0.50	1100	0.50	8653242
Carbonate (CO3)	mg/L	2.4	0.50	<0.50	0.50	54	0.50	<0.50	0.50	8653242
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	8653242
Dissolved Sulphate (SO4)	mg/L	1900 (1)	20	3300 (1)	50	77	1.0	4700 (1)	75	8652859
Dissolved Chloride (Cl)	mg/L	13	1.0	1.9	1.0	21	1.0	3.7	1.0	8652855
Nutrients										
Dissolved Nitrite (N)	mg/L	<0.010	0.010	<0.050 (2)	0.050	<0.010	0.010	<0.050 (2)	0.050	8651679
Dissolved Nitrate (N)	mg/L	16 (1)	0.020	0.086 (2)	0.050	<0.010	0.010	0.19 (2)	0.050	8651679
Elements										
Dissolved Aluminum (Al)	mg/L	0.0058	0.0030	0.0037	0.0030	0.010	0.0030	<0.0030	0.0030	8654128
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	<0.00060	0.00060	0.0013	0.00060	<0.00060	0.00060	8654128
Dissolved Arsenic (As)	mg/L	0.00030	0.00020	0.00027	0.00020	0.0090	0.00020	0.00030	0.00020	8654128
Dissolved Barium (Ba)	mg/L	<0.10	0.10	<0.10	0.10	0.063	0.010	<0.10	0.10	8655691
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Boron (B)	mg/L	0.90	0.20	0.25	0.20	0.85	0.020	0.36	0.20	8655691

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9044		RE9045		RE9046		RE9047		
Sampling Date		2017/06/01 10:10		2017/06/01 10:20		2017/06/01 09:45		2017/06/01 10:00		
COC Number		523760-03-01		523760-03-01		523760-03-01		523760-03-01		
	UNITS	MW-22A	RDL	MW-22B	RDL	MW-23A	RDL	MW-23B	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	36	3.0	110	3.0	4.4	0.30	170	3.0	8655691
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Cobalt (Co)	mg/L	<0.00030	0.00030	<0.00030	0.00030	<0.00030	0.00030	0.00033	0.00030	8654128
Dissolved Copper (Cu)	mg/L	0.0020	0.00020	0.00037	0.00020	<0.00020	0.00020	<0.00020	0.00020	8654128
Dissolved Iron (Fe)	mg/L	<0.60	0.60	<0.60	0.60	<0.060	0.060	<0.60	0.60	8655691
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	8654128
Dissolved Lithium (Li)	mg/L	0.35	0.20	0.75	0.20	0.11	0.020	0.90	0.20	8655691
Dissolved Magnesium (Mg)	mg/L	3.6	2.0	54	2.0	0.47	0.20	66	2.0	8655691
Dissolved Manganese (Mn)	mg/L	<0.040	0.040	<0.040	0.040	0.0064	0.0040	0.12	0.040	8655691
Dissolved Molybdenum (Mo)	mg/L	0.0060	0.00020	0.00082	0.00020	0.0045	0.00020	0.00025	0.00020	8654128
Dissolved Nickel (Ni)	mg/L	0.0023	0.00050	0.0013	0.00050	0.0095	0.00050	0.0012	0.00050	8654128
Dissolved Phosphorus (P)	mg/L	<1.0	1.0	<1.0	1.0	<0.10	0.10	<1.0	1.0	8655691
Dissolved Potassium (K)	mg/L	4.6	3.0	9.8	3.0	2.0	0.30	12	3.0	8655691
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	0.00028	0.00020	<0.00020	0.00020	<0.00020	0.00020	8654128
Dissolved Silicon (Si)	mg/L	2.9	1.0	4.7	1.0	3.1	0.10	5.4	1.0	8655691
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	<0.00010	0.00010	<0.00010	0.00010	<0.00010	0.00010	8654128
Dissolved Sodium (Na)	mg/L	1300	5.0	2000	5.0	570 (1)	5.0	2400	5.0	8655691
Dissolved Strontium (Sr)	mg/L	0.94	0.20	2.5	0.20	0.12	0.020	3.9	0.20	8655691
Dissolved Sulphur (S)	mg/L	650	2.0	1200	2.0	23	0.20	1600	2.0	8655691
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	8654128
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Uranium (U)	mg/L	0.0041	0.00010	0.0079	0.00010	0.0049	0.00010	0.0035	0.00010	8654128
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	<0.0030	0.0030	<0.0030	0.0030	<0.0030	0.0030	8654128

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

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9048		RE9049		RE9050		
Sampling Date		2017/06/01 11:20		2017/06/01 11:40		2017/06/01 12:10		
COC Number		523760-03-01		523760-03-01		523760-04-01		
	UNITS	MW-25B	RDL	MW-26B	RDL	MW-27A	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	100	N/A	84	N/A	31	N/A	8650956
Cation Sum	meq/L	110	N/A	89	N/A	31	N/A	8650956
Hardness (CaCO3)	mg/L	700	0.50	570	0.50	26	0.50	8650954
Ion Balance (% Difference)	%	6.0	N/A	3.1	N/A	0.027	N/A	8650955
Dissolved Nitrate (NO3)	mg/L	2.5	0.22	0.42	0.22	0.47	0.044	8650872
Nitrate plus Nitrite (N)	mg/L	0.56	0.050	0.095	0.050	0.19	0.010	8650873
Dissolved Nitrite (NO2)	mg/L	<0.16	0.16	<0.16	0.16	0.28	0.033	8650872
Calculated Total Dissolved Solids	mg/L	7100	10	5700	10	1900	10	8650958
Misc. Inorganics								
Conductivity	uS/cm	9500	1.0	7600	1.0	2900	1.0	8653243
pH	pH	8.14	N/A	8.19	N/A	8.60	N/A	8653215
Low Level Elements								
Dissolved Cadmium (Cd)	ug/L	<0.020	0.020	<0.020	0.020	<0.020	0.020	8651027
Anions								
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	<0.50	0.50	21	0.50	8653242
Alkalinity (Total as CaCO3)	mg/L	840	0.50	860	0.50	800	0.50	8653242
Bicarbonate (HCO3)	mg/L	1000	0.50	1000	0.50	920	0.50	8653242
Carbonate (CO3)	mg/L	<0.50	0.50	<0.50	0.50	26	0.50	8653242
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	8653242
Dissolved Sulphate (SO4)	mg/L	4100 (1)	75	3200 (1)	50	720 (1)	5.0	8652859
Dissolved Chloride (Cl)	mg/L	2.3	1.0	4.5	1.0	6.9	1.0	8652855
Nutrients								
Dissolved Nitrite (N)	mg/L	<0.050 (2)	0.050	<0.050 (2)	0.050	0.084	0.010	8651679
Dissolved Nitrate (N)	mg/L	0.56 (2)	0.050	0.095 (2)	0.050	0.11	0.010	8651679
Elements								
Dissolved Aluminum (Al)	mg/L	0.0053	0.0030	0.0072	0.0030	0.029	0.0030	8654128
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	<0.00060	0.00060	<0.00060	0.00060	8654128
Dissolved Arsenic (As)	mg/L	0.00047	0.00020	0.00077	0.00020	0.0030	0.00020	8654128
Dissolved Barium (Ba)	mg/L	<0.10	0.10	<0.10	0.10	0.016	0.010	8655691
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Boron (B)	mg/L	0.47	0.20	0.29	0.20	0.83	0.020	8655691

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9048		RE9049		RE9050		
Sampling Date		2017/06/01 11:20		2017/06/01 11:40		2017/06/01 12:10		
COC Number		523760-03-01		523760-03-01		523760-04-01		
	UNITS	MW-25B	RDL	MW-26B	RDL	MW-27A	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	190	3.0	120	3.0	8.7	0.30	8655691
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Cobalt (Co)	mg/L	0.00065	0.00030	0.00081	0.00030	<0.00030	0.00030	8654128
Dissolved Copper (Cu)	mg/L	0.00041	0.00020	0.00039	0.00020	0.00030	0.00020	8654128
Dissolved Iron (Fe)	mg/L	<0.60	0.60	<0.60	0.60	<0.060	0.060	8655691
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	8654128
Dissolved Lithium (Li)	mg/L	0.72	0.20	0.48	0.20	0.13	0.020	8655691
Dissolved Magnesium (Mg)	mg/L	54	2.0	66	2.0	1.0	0.20	8655691
Dissolved Manganese (Mn)	mg/L	0.21	0.040	0.22	0.040	0.012	0.0040	8655691
Dissolved Molybdenum (Mo)	mg/L	0.00067	0.00020	0.00087	0.00020	0.0019	0.00020	8654128
Dissolved Nickel (Ni)	mg/L	0.0028	0.00050	0.0013	0.00050	0.0014	0.00050	8654128
Dissolved Phosphorus (P)	mg/L	<1.0	1.0	<1.0	1.0	0.16	0.10	8655691
Dissolved Potassium (K)	mg/L	12	3.0	7.5	3.0	2.3	0.30	8655691
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	8654128
Dissolved Silicon (Si)	mg/L	4.4	1.0	4.5	1.0	4.0	0.10	8655691
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	<0.00010	0.00010	<0.00010	0.00010	8654128
Dissolved Sodium (Na)	mg/L	2300	5.0	1800	5.0	700 (1)	5.0	8655691
Dissolved Strontium (Sr)	mg/L	4.3	0.20	2.5	0.20	0.22	0.020	8655691
Dissolved Sulphur (S)	mg/L	1600	2.0	1200	2.0	240	0.20	8655691
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	8654128
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Uranium (U)	mg/L	0.00028	0.00010	0.00082	0.00010	0.00057	0.00010	8654128
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	<0.0010	0.0010	0.0092	0.0010	8654128
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	<0.0030	0.0030	<0.0030	0.0030	8654128

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

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9051			RE9052			RE9053		
Sampling Date		2017/06/01 12:00			2017/06/01 12:35			2017/06/01 12:45		
COC Number		523760-04-01			523760-04-01			523760-04-01		
	UNITS	MW-27B	RDL	QC Batch	MW-28A	RDL	QC Batch	MW-28B	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	140	N/A	8650956	36	N/A	8650956	140	N/A	8651032
Cation Sum	meq/L	150	N/A	8650956	36	N/A	8650956	160	N/A	8651032
Hardness (CaCO3)	mg/L	860	0.50	8650954	36	0.50	8650954	960	0.50	8651030
Ion Balance (% Difference)	%	4.4	N/A	8650955	0.99	N/A	8650955	7.3	N/A	8651031
Dissolved Nitrate (NO3)	mg/L	1.5	0.22	8651033	0.044	0.044	8651033	<0.22	0.22	8651033
Nitrate plus Nitrite (N)	mg/L	0.39	0.050	8651034	0.010	0.010	8651034	0.12	0.050	8651034
Dissolved Nitrite (NO2)	mg/L	0.21	0.16	8651033	<0.033	0.033	8651033	0.38	0.16	8651033
Calculated Total Dissolved Solids	mg/L	9400	10	8650958	2300	10	8650958	9700	10	8651038
Misc. Inorganics										
Conductivity	uS/cm	12000	1.0	8653214	3300	1.0	8653214	12000	1.0	8653214
pH	pH	8.10	N/A	8653201	8.47	N/A	8653201	8.08	N/A	8653201
Low Level Elements										
Dissolved Cadmium (Cd)	ug/L	0.022	0.020	8651027	<0.020	0.020	8651027	0.022	0.020	8651027
Anions										
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8653213	11	0.50	8653213	<0.50	0.50	8653213
Alkalinity (Total as CaCO3)	mg/L	1500	0.50	8653213	720	0.50	8653213	870	0.50	8653213
Bicarbonate (HCO3)	mg/L	1900	0.50	8653213	850	0.50	8653213	1100	0.50	8653213
Carbonate (CO3)	mg/L	<0.50	0.50	8653213	13	0.50	8653213	<0.50	0.50	8653213
Hydroxide (OH)	mg/L	<0.50	0.50	8653213	<0.50	0.50	8653213	<0.50	0.50	8653213
Dissolved Sulphate (SO4)	mg/L	5100 (1)	75	8652859	1000 (1)	10	8652859	5700 (1)	100	8652859
Dissolved Chloride (Cl)	mg/L	51	1.0	8652855	5.0	1.0	8652855	30	1.0	8652855
Nutrients										
Dissolved Nitrite (N)	mg/L	0.064 (2)	0.050	8651679	<0.010	0.010	8651681	0.12 (2)	0.050	8651681
Dissolved Nitrate (N)	mg/L	0.33 (2)	0.050	8651679	0.010	0.010	8651681	<0.050 (2)	0.050	8651681
Elements										
Dissolved Aluminum (Al)	mg/L	0.010	0.0030	8654128	0.0050	0.0030	8654128	0.0039	0.0030	8654128
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	8654128	<0.00060	0.00060	8654128	<0.00060	0.00060	8654128
Dissolved Arsenic (As)	mg/L	0.0019	0.00020	8654128	0.00053	0.00020	8654128	0.00040	0.00020	8654128
Dissolved Barium (Ba)	mg/L	<0.10	0.10	8655691	<0.010	0.010	8655691	<0.10	0.10	8655691
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128
Dissolved Boron (B)	mg/L	0.46	0.20	8655691	0.82	0.020	8655691	0.44	0.20	8655691

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9051			RE9052			RE9053		
Sampling Date		2017/06/01 12:00			2017/06/01 12:35			2017/06/01 12:45		
COC Number		523760-04-01			523760-04-01			523760-04-01		
	UNITS	MW-27B	RDL	QC Batch	MW-28A	RDL	QC Batch	MW-28B	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	140	3.0	8655691	13	0.30	8655691	220	3.0	8655691
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128
Dissolved Cobalt (Co)	mg/L	0.0012	0.00030	8654128	<0.00030	0.00030	8654128	0.0015	0.00030	8654128
Dissolved Copper (Cu)	mg/L	<0.00020	0.00020	8654128	<0.00020	0.00020	8654128	0.00033	0.00020	8654128
Dissolved Iron (Fe)	mg/L	<0.60	0.60	8655691	<0.060	0.060	8655691	<0.60	0.60	8655691
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	8654128	<0.00020	0.00020	8654128	<0.00020	0.00020	8654128
Dissolved Lithium (Li)	mg/L	0.54	0.20	8655691	0.15	0.020	8655691	0.69	0.20	8655691
Dissolved Magnesium (Mg)	mg/L	130	2.0	8655691	1.2	0.20	8655691	100	2.0	8655691
Dissolved Manganese (Mn)	mg/L	0.062	0.040	8655691	0.019	0.0040	8655691	0.25	0.040	8655691
Dissolved Molybdenum (Mo)	mg/L	0.0018	0.00020	8654128	0.0016	0.00020	8654128	0.00078	0.00020	8654128
Dissolved Nickel (Ni)	mg/L	0.0051	0.00050	8654128	0.00082	0.00050	8654128	0.0038	0.00050	8654128
Dissolved Phosphorus (P)	mg/L	<1.0	1.0	8655691	<0.10	0.10	8655691	<1.0	1.0	8655691
Dissolved Potassium (K)	mg/L	11	3.0	8655691	2.7	0.30	8655691	12	3.0	8655691
Dissolved Selenium (Se)	mg/L	0.00020	0.00020	8654128	<0.00020	0.00020	8654128	<0.00020	0.00020	8654128
Dissolved Silicon (Si)	mg/L	4.5	1.0	8655691	4.0	0.10	8655691	4.7	1.0	8655691
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	8654128	<0.00010	0.00010	8654128	<0.00010	0.00010	8654128
Dissolved Sodium (Na)	mg/L	3100	5.0	8655691	810 (1)	5.0	8655691	3200	5.0	8655691
Dissolved Strontium (Sr)	mg/L	4.5	0.20	8655691	0.31	0.020	8655691	5.4	0.20	8655691
Dissolved Sulphur (S)	mg/L	1900	2.0	8655691	340	0.20	8655691	2200	2.0	8655691
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	8654128	<0.00020	0.00020	8654128	<0.00020	0.00020	8654128
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128	<0.0010	0.0010	8654128
Dissolved Uranium (U)	mg/L	0.0034	0.00010	8654128	0.00025	0.00010	8654128	0.00054	0.00010	8654128
Dissolved Vanadium (V)	mg/L	0.0054	0.0010	8654128	0.0016	0.0010	8654128	<0.0010	0.0010	8654128
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	8654128	<0.0030	0.0030	8654128	<0.0030	0.0030	8654128

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

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9054			RE9055		RE9056		
Sampling Date		2017/06/01 13:15			2017/06/01 13:30		2017/06/01 13:35		
COC Number		523760-04-01			523760-04-01		523760-04-01		
	UNITS	MW-29A	RDL	QC Batch	MW-29B	RDL	MW-30A	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	36	N/A	8651032	110	N/A	21	N/A	8651032
Cation Sum	meq/L	38	N/A	8651032	120	N/A	21	N/A	8651032
Hardness (CaCO3)	mg/L	100	0.50	8651030	2300	0.50	28	0.50	8651030
Ion Balance (% Difference)	%	2.0	N/A	8651031	4.6	N/A	0.27	N/A	8651031
Dissolved Nitrate (NO3)	mg/L	0.33	0.22	8651033	<0.22	0.22	0.19	0.044	8651033
Nitrate plus Nitrite (N)	mg/L	0.40	0.050	8651034	<0.050	0.050	0.067	0.010	8651034
Dissolved Nitrite (NO2)	mg/L	1.1	0.16	8651033	<0.16	0.16	0.081	0.033	8651033
Calculated Total Dissolved Solids	mg/L	2400	10	8651038	7400	10	1200	10	8651038
Misc. Inorganics									
Conductivity	uS/cm	3400	1.0	8653214	8500	1.0	1900	1.0	8653243
pH	pH	8.34	N/A	8653201	7.90	N/A	8.57	N/A	8653215
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	0.020	8651027	0.060	0.020	<0.020	0.020	8651027
Anions									
Alkalinity (PP as CaCO3)	mg/L	2.5	0.50	8653213	<0.50	0.50	14	0.50	8653242
Alkalinity (Total as CaCO3)	mg/L	630	0.50	8653213	450	0.50	660	0.50	8653242
Bicarbonate (HCO3)	mg/L	760	0.50	8653213	550	0.50	770	0.50	8653242
Carbonate (CO3)	mg/L	3.0	0.50	8653213	<0.50	0.50	17	0.50	8653242
Hydroxide (OH)	mg/L	<0.50	0.50	8653213	<0.50	0.50	<0.50	0.50	8653242
Dissolved Sulphate (SO4)	mg/L	1100 (1)	10	8652859	4700 (1)	75	360 (1)	5.0	8652859
Dissolved Chloride (Cl)	mg/L	3.6	1.0	8652855	6.0	1.0	1.3	1.0	8652855
Nutrients									
Dissolved Nitrite (N)	mg/L	0.33 (2)	0.050	8651681	<0.050 (2)	0.050	0.025	0.010	8651681
Dissolved Nitrate (N)	mg/L	0.074 (2)	0.050	8651681	<0.050 (2)	0.050	0.042	0.010	8651681
Elements									
Dissolved Aluminum (Al)	mg/L	0.0079	0.0030	8654128	0.010	0.0030	0.011	0.0030	8654128
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	8654128	<0.00060	0.00060	<0.00060	0.00060	8654128
Dissolved Arsenic (As)	mg/L	0.00093	0.00020	8654128	0.00031	0.00020	0.00089	0.00020	8654128
Dissolved Barium (Ba)	mg/L	0.018	0.010	8655691	<0.10	0.10	0.015	0.010	8655691
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	8654128	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Boron (B)	mg/L	0.74	0.020	8655691	0.21	0.20	0.40	0.020	8655691

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9054			RE9055		RE9056		
Sampling Date		2017/06/01 13:15			2017/06/01 13:30		2017/06/01 13:35		
COC Number		523760-04-01			523760-04-01		523760-04-01		
	UNITS	MW-29A	RDL	QC Batch	MW-29B	RDL	MW-30A	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	32	0.30	8655691	530	3.0	8.9	0.30	8655691
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	8654128	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Cobalt (Co)	mg/L	0.00046	0.00030	8654128	0.0044	0.00030	<0.00030	0.00030	8654128
Dissolved Copper (Cu)	mg/L	0.00093	0.00020	8654128	0.00098	0.00020	0.00034	0.00020	8654128
Dissolved Iron (Fe)	mg/L	<0.060	0.060	8655691	<0.60	0.60	<0.060	0.060	8655691
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	8654128	<0.00020	0.00020	<0.00020	0.00020	8654128
Dissolved Lithium (Li)	mg/L	0.23	0.020	8655691	0.67	0.20	0.16	0.020	8655691
Dissolved Magnesium (Mg)	mg/L	5.2	0.20	8655691	240	2.0	1.4	0.20	8655691
Dissolved Manganese (Mn)	mg/L	0.060	0.0040	8655691	0.88	0.040	0.018	0.0040	8655691
Dissolved Molybdenum (Mo)	mg/L	0.0019	0.00020	8654128	0.00057	0.00020	0.0015	0.00020	8654128
Dissolved Nickel (Ni)	mg/L	0.0014	0.00050	8654128	0.0075	0.00050	0.0023	0.00050	8654128
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	8655691	<1.0	1.0	0.10	0.10	8655691
Dissolved Potassium (K)	mg/L	4.1	0.30	8655691	11	3.0	2.2	0.30	8655691
Dissolved Selenium (Se)	mg/L	0.00027	0.00020	8654128	<0.00020	0.00020	<0.00020	0.00020	8654128
Dissolved Silicon (Si)	mg/L	3.7	0.10	8655691	5.6	1.0	3.9	0.10	8655691
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	8654128	<0.00010	0.00010	<0.00010	0.00010	8654128
Dissolved Sodium (Na)	mg/L	810 (1)	5.0	8655691	1600	5.0	460	0.50	8655691
Dissolved Strontium (Sr)	mg/L	0.68	0.020	8655691	8.0	0.20	0.14	0.020	8655691
Dissolved Sulphur (S)	mg/L	390	0.20	8655691	1700	2.0	120	0.20	8655691
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	8654128	<0.00020	0.00020	<0.00020	0.00020	8654128
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	8654128	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	8654128	<0.0010	0.0010	<0.0010	0.0010	8654128
Dissolved Uranium (U)	mg/L	0.00055	0.00010	8654128	0.0061	0.00010	0.00018	0.00010	8654128
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	8654128	<0.0010	0.0010	0.011	0.0010	8654128
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	8654128	<0.0030	0.0030	<0.0030	0.0030	8654128

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

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9057	RE9058		RE9059		RE9060		
Sampling Date		2017/06/01 13:45	2017/06/01 14:45		2017/06/01 14:20		2017/06/01 14:30		
COC Number		523760-04-01	523760-04-01		523760-05-01		523760-05-01		
	UNITS	MW-30B	MW-31B	RDL	MW-32A	RDL	MW-32B	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	27	27	N/A	88	N/A	140	N/A	8651032
Cation Sum	meq/L	26	26	N/A	96	N/A	150	N/A	8651032
Hardness (CaCO3)	mg/L	97	59	0.50	350	0.50	950	0.50	8651030
Ion Balance (% Difference)	%	0.76	1.7	N/A	4.4	N/A	1.9	N/A	8651031
Dissolved Nitrate (NO3)	mg/L	1.5	0.80	0.044	<0.22	0.22	<0.22	0.22	8651033
Nitrate plus Nitrite (N)	mg/L	0.34	0.18	0.010	0.22	0.050	<0.050	0.050	8651034
Dissolved Nitrite (NO2)	mg/L	<0.033	<0.033	0.033	0.71	0.16	<0.16	0.16	8651033
Calculated Total Dissolved Solids	mg/L	1700	1700	10	6100	10	9800	10	8651038
Misc. Inorganics									
Conductivity	uS/cm	2500	2500	1.0	8000	1.0	12000	1.0	8653214
pH	pH	8.32	8.40	N/A	8.12	N/A	7.98	N/A	8653201
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	<0.020	0.020	0.021	0.020	0.083	0.020	8651027
Anions									
Alkalinity (PP as CaCO3)	mg/L	<0.50	4.3	0.50	<0.50	0.50	<0.50	0.50	8653213
Alkalinity (Total as CaCO3)	mg/L	560	530	0.50	850	0.50	1000	0.50	8653213
Bicarbonate (HCO3)	mg/L	680	640	0.50	1000	0.50	1300	0.50	8653213
Carbonate (CO3)	mg/L	<0.50	5.2	0.50	<0.50	0.50	<0.50	0.50	8653213
Hydroxide (OH)	mg/L	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	8653213
Dissolved Sulphate (SO4)	mg/L	750 (1)	780 (1)	5.0	3400 (1)	50	5700 (1)	75	8652859
Dissolved Chloride (Cl)	mg/L	1.8	1.4	1.0	3.2	1.0	120	1.0	8652855
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	<0.010	0.010	0.22 (2)	0.050	<0.050 (2)	0.050	8651681
Dissolved Nitrate (N)	mg/L	0.34	0.18	0.010	<0.050 (2)	0.050	<0.050 (2)	0.050	8651681
Elements									
Dissolved Aluminum (Al)	mg/L	0.0039	0.011	0.0030	0.0080	0.0030	0.016	0.0030	8654122
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	0.00060	<0.00060	0.00060	<0.00060	0.00060	8654122
Dissolved Arsenic (As)	mg/L	0.00068	0.0011	0.00020	0.00037	0.00020	0.00085	0.00020	8654122
Dissolved Barium (Ba)	mg/L	0.024	0.022	0.010	<0.10	0.10	<0.10	0.10	8655701
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654122
Dissolved Boron (B)	mg/L	0.12	0.17	0.020	1.2	0.20	0.46	0.20	8655701

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9057	RE9058		RE9059		RE9060		
Sampling Date		2017/06/01 13:45	2017/06/01 14:45		2017/06/01 14:20		2017/06/01 14:30		
COC Number		523760-04-01	523760-04-01		523760-05-01		523760-05-01		
	UNITS	MW-30B	MW-31B	RDL	MW-32A	RDL	MW-32B	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	24	14	0.30	120	3.0	210	3.0	8655701
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654122
Dissolved Cobalt (Co)	mg/L	<0.00030	<0.00030	0.00030	0.00062	0.00030	0.0028	0.00030	8654122
Dissolved Copper (Cu)	mg/L	0.00083	0.00027	0.00020	0.00073	0.00020	0.0022	0.00020	8654122
Dissolved Iron (Fe)	mg/L	<0.060	<0.060	0.060	<0.60	0.60	<0.60	0.60	8655701
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	8654122
Dissolved Lithium (Li)	mg/L	0.24	0.15	0.020	0.49	0.20	0.47	0.20	8655701
Dissolved Magnesium (Mg)	mg/L	8.9	5.6	0.20	15	2.0	100	2.0	8655701
Dissolved Manganese (Mn)	mg/L	<0.0040	0.017	0.0040	0.14	0.040	0.67	0.040	8655701
Dissolved Molybdenum (Mo)	mg/L	0.00092	0.0014	0.00020	0.00068	0.00020	0.0012	0.00020	8654122
Dissolved Nickel (Ni)	mg/L	0.0010	0.00081	0.00050	0.0016	0.00050	0.0066	0.00050	8654122
Dissolved Phosphorus (P)	mg/L	0.13	0.13	0.10	<1.0	1.0	<1.0	1.0	8655701
Dissolved Potassium (K)	mg/L	2.9	3.3	0.30	7.7	3.0	15	3.0	8655701
Dissolved Selenium (Se)	mg/L	0.00046	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	8654122
Dissolved Silicon (Si)	mg/L	4.8	3.6	0.10	5.3	1.0	4.7	1.0	8655701
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	0.00010	<0.00010	0.00010	<0.00010	0.00010	8654122
Dissolved Sodium (Na)	mg/L	560 (1)	570 (1)	5.0	2000	5.0	3000	5.0	8655701
Dissolved Strontium (Sr)	mg/L	0.35	0.24	0.020	3.0	0.20	4.7	0.20	8655701
Dissolved Sulphur (S)	mg/L	250	250	0.20	1300	2.0	2000	2.0	8655701
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	8654122
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654122
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654122
Dissolved Uranium (U)	mg/L	0.0038	0.0012	0.00010	0.00014	0.00010	0.00084	0.00010	8654122
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	8654122
Dissolved Zinc (Zn)	mg/L	<0.0030	<0.0030	0.0030	<0.0030	0.0030	<0.0030	0.0030	8654122

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

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9061	RE9062			RE9063		
Sampling Date		2017/06/01 09:30	2017/06/01			2017/06/01		
COC Number		523760-05-01	523760-06-01			523760-06-01		
	UNITS	MW-35B	17DUPLICATE 1	RDL	QC Batch	17DUPLICATE 2	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	82	87	N/A	8651032	89	N/A	8651032
Cation Sum	meq/L	86	94	N/A	8651032	89	N/A	8651032
Hardness (CaCO3)	mg/L	300	490	0.50	8651030	570	0.50	8651030
Ion Balance (% Difference)	%	2.3	3.7	N/A	8651031	0.022	N/A	8651031
Dissolved Nitrate (NO3)	mg/L	2.5	0.30	0.22	8651033	0.37	0.22	8651033
Nitrate plus Nitrite (N)	mg/L	0.56	0.067	0.050	8651034	0.084	0.050	8651034
Dissolved Nitrite (NO2)	mg/L	<0.16	<0.16	0.16	8651033	<0.16	0.16	8651033
Calculated Total Dissolved Solids	mg/L	5700	5900	10	8651038	5900	10	8651038
Misc. Inorganics								
Conductivity	uS/cm	7600	8000	1.0	8653214	7500	1.0	8653214
pH	pH	8.22	8.10	N/A	8653201	8.11	N/A	8653201
Low Level Elements								
Dissolved Cadmium (Cd)	ug/L	0.022	<0.020	0.020	8651027	<0.020	0.020	8651027
Anions								
Alkalinity (PP as CaCO3)	mg/L	<0.50	<0.50	0.50	8653213	<0.50	0.50	8653213
Alkalinity (Total as CaCO3)	mg/L	640	1000	0.50	8653213	860	0.50	8653213
Bicarbonate (HCO3)	mg/L	780	1200	0.50	8653213	1000	0.50	8653213
Carbonate (CO3)	mg/L	<0.50	<0.50	0.50	8653213	<0.50	0.50	8653213
Hydroxide (OH)	mg/L	<0.50	<0.50	0.50	8653213	<0.50	0.50	8653213
Dissolved Sulphate (SO4)	mg/L	3300 (1)	3200 (1)	50	8652859	3500 (1)	25	8652867
Dissolved Chloride (Cl)	mg/L	6.8	1.7	1.0	8652855	4.6	1.0	8652862
Nutrients								
Dissolved Nitrite (N)	mg/L	<0.050 (2)	<0.050 (2)	0.050	8651681	<0.050 (2)	0.050	8651681
Dissolved Nitrate (N)	mg/L	0.56 (2)	0.067 (2)	0.050	8651681	0.084 (2)	0.050	8651681
Elements								
Dissolved Aluminum (Al)	mg/L	0.0035	<0.0030	0.0030	8654122	0.0073	0.0030	8654122
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	0.00060	8654122	<0.00060	0.00060	8654122
Dissolved Arsenic (As)	mg/L	0.0014	0.00028	0.00020	8654122	0.00077	0.00020	8654122
Dissolved Barium (Ba)	mg/L	<0.10	<0.10	0.10	8655701	<0.10	0.10	8655701
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	0.0010	8654122	<0.0010	0.0010	8654122
Dissolved Boron (B)	mg/L	0.71	0.25	0.20	8655701	0.28	0.20	8655701

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9061	RE9062			RE9063		
Sampling Date		2017/06/01 09:30	2017/06/01			2017/06/01		
COC Number		523760-05-01	523760-06-01			523760-06-01		
	UNITS	MW-35B	17DUPLICATE 1	RDL	QC Batch	17DUPLICATE 2	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	98	110	3.0	8655701	120	3.0	8655701
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	0.0010	8654122	<0.0010	0.0010	8654122
Dissolved Cobalt (Co)	mg/L	0.00054	<0.00030	0.00030	8654122	0.00073	0.00030	8654122
Dissolved Copper (Cu)	mg/L	0.0032	0.00057	0.00020	8654122	0.00055	0.00020	8654122
Dissolved Iron (Fe)	mg/L	<0.60	<0.60	0.60	8655701	<0.60	0.60	8655701
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	0.00020	8654122	<0.00020	0.00020	8654122
Dissolved Lithium (Li)	mg/L	0.52	0.70	0.20	8655701	0.49	0.20	8655701
Dissolved Magnesium (Mg)	mg/L	14	53	2.0	8655701	67	2.0	8655701
Dissolved Manganese (Mn)	mg/L	0.074	<0.040	0.040	8655701	0.22	0.040	8655701
Dissolved Molybdenum (Mo)	mg/L	0.0041	0.00081	0.00020	8654122	0.00085	0.00020	8654122
Dissolved Nickel (Ni)	mg/L	0.0036	0.0014	0.00050	8654122	0.0013	0.00050	8654122
Dissolved Phosphorus (P)	mg/L	<1.0	<1.0	1.0	8655701	<1.0	1.0	8655701
Dissolved Potassium (K)	mg/L	8.6	9.4	3.0	8655701	7.6	3.0	8655701
Dissolved Selenium (Se)	mg/L	0.00053	0.00032	0.00020	8654122	<0.00020	0.00020	8654122
Dissolved Silicon (Si)	mg/L	3.1	4.8	1.0	8655701	4.3	1.0	8655701
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	0.00010	8654122	<0.00010	0.00010	8654122
Dissolved Sodium (Na)	mg/L	1800	1900	5.0	8655701	1800	5.0	8655701
Dissolved Strontium (Sr)	mg/L	2.3	2.4	0.20	8655701	2.5	0.20	8655701
Dissolved Sulphur (S)	mg/L	1200	1200	2.0	8655701	1200	2.0	8655701
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	0.00020	8654122	<0.00020	0.00020	8654122
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	0.0010	8654122	<0.0010	0.0010	8654122
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010	0.0010	8654122	<0.0010	0.0010	8654122
Dissolved Uranium (U)	mg/L	0.0015	0.0077	0.00010	8654122	0.00085	0.00010	8654122
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	0.0010	8654122	<0.0010	0.0010	8654122
Dissolved Zinc (Zn)	mg/L	<0.0030	<0.0030	0.0030	8654122	<0.0030	0.0030	8654122
RDL = Reportable Detection Limit								

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ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9064		
Sampling Date		2017/06/01		
COC Number		523760-06-01		
	UNITS	17DUPLICATE 3	RDL	QC Batch
Calculated Parameters				
Anion Sum	meq/L	150	N/A	8651032
Cation Sum	meq/L	160	N/A	8651032
Hardness (CaCO3)	mg/L	960	0.50	8651030
Ion Balance (% Difference)	%	1.4	N/A	8651031
Dissolved Nitrate (NO3)	mg/L	<0.22	0.22	8651033
Nitrate plus Nitrite (N)	mg/L	0.19	0.050	8651034
Dissolved Nitrite (NO2)	mg/L	0.62	0.16	8651033
Calculated Total Dissolved Solids	mg/L	10000	10	8651038
Misc. Inorganics				
Conductivity	uS/cm	12000	1.0	8653214
pH	pH	8.08	N/A	8653201
Low Level Elements				
Dissolved Cadmium (Cd)	ug/L	0.027	0.020	8651027
Anions				
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8653213
Alkalinity (Total as CaCO3)	mg/L	880	0.50	8653213
Bicarbonate (HCO3)	mg/L	1100	0.50	8653213
Carbonate (CO3)	mg/L	<0.50	0.50	8653213
Hydroxide (OH)	mg/L	<0.50	0.50	8653213
Dissolved Sulphate (SO4)	mg/L	6400 (1)	50	8652867
Dissolved Chloride (Cl)	mg/L	31	1.0	8652862
Nutrients				
Dissolved Nitrite (N)	mg/L	0.19 (2)	0.050	8651681
Dissolved Nitrate (N)	mg/L	<0.050 (2)	0.050	8651681
Elements				
Dissolved Aluminum (Al)	mg/L	0.0035	0.0030	8654122
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	8654122
Dissolved Arsenic (As)	mg/L	0.00038	0.00020	8654122
Dissolved Barium (Ba)	mg/L	<0.10	0.10	8655701
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	8654122

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RE9064		
Sampling Date		2017/06/01		
COC Number		523760-06-01		
	UNITS	17DUPLICATE 3	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.46	0.20	8655701
Dissolved Calcium (Ca)	mg/L	220	3.0	8655701
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	8654122
Dissolved Cobalt (Co)	mg/L	0.0015	0.00030	8654122
Dissolved Copper (Cu)	mg/L	0.00060	0.00020	8654122
Dissolved Iron (Fe)	mg/L	<0.60	0.60	8655701
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	8654122
Dissolved Lithium (Li)	mg/L	0.69	0.20	8655701
Dissolved Magnesium (Mg)	mg/L	100	2.0	8655701
Dissolved Manganese (Mn)	mg/L	0.25	0.040	8655701
Dissolved Molybdenum (Mo)	mg/L	0.00068	0.00020	8654122
Dissolved Nickel (Ni)	mg/L	0.0035	0.00050	8654122
Dissolved Phosphorus (P)	mg/L	<1.0	1.0	8655701
Dissolved Potassium (K)	mg/L	12	3.0	8655701
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	8654122
Dissolved Silicon (Si)	mg/L	4.8	1.0	8655701
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	8654122
Dissolved Sodium (Na)	mg/L	3100	5.0	8655701
Dissolved Strontium (Sr)	mg/L	5.4	0.20	8655701
Dissolved Sulphur (S)	mg/L	2200	2.0	8655701
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	8654122
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	8654122
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	8654122
Dissolved Uranium (U)	mg/L	0.00052	0.00010	8654122
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	8654122
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	8654122
RDL = Reportable Detection Limit				

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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		RE9030		RE9031		RE9039		RE9040		
Sampling Date		2017/06/01 15:25		2017/06/01 15:35		2017/06/01 16:00		2017/06/01 15:05		
COC Number		523760-01-01		523760-01-01		523760-02-01		523760-02-01		
	UNITS	MW-18A	QC Batch	MW-18B	QC Batch	MW-1C	QC Batch	MW-19A	RDL	QC Batch
Demand Parameters										
Total Chemical Oxygen Demand	mg/L	26	8652761	24	8652761	28	8652761	27	5.0	8652761
Misc. Inorganics										
Dissolved Organic Carbon (C)	mg/L	7.2	8657532	11	8657532	10	8657532	7.1	0.50	8657532
Nutrients										
Total Ammonia (N)	mg/L	0.72	8653709	0.17	8653736	0.70	8653709	0.76	0.015	8653736
Total Total Kjeldahl Nitrogen	mg/L	0.94	8655308	0.87	8657060	1.1	8655308	1.1	0.050	8655308
RDL = Reportable Detection Limit										

Maxxam ID		RE9041	RE9042	RE9043		RE9044		
Sampling Date		2017/06/01 15:15	2017/06/01 10:50	2017/06/01 11:00		2017/06/01 10:10		
COC Number		523760-02-01	523760-02-01	523760-03-01		523760-03-01		
	UNITS	MW-19B	MW-20B	MW-21B	QC Batch	MW-22A	RDL	QC Batch
Demand Parameters								
Total Chemical Oxygen Demand	mg/L	17	81	20	8652761	36	5.0	8652761
Misc. Inorganics								
Dissolved Organic Carbon (C)	mg/L	6.3	6.0	6.1	8657532	6.7	0.50	8657532
Nutrients								
Total Ammonia (N)	mg/L	0.84	0.035	0.016	8653736	0.15	0.015	8655352
Total Total Kjeldahl Nitrogen	mg/L	1.0	0.74	0.31	8655308	1.0	0.050	8655308
RDL = Reportable Detection Limit								

Maxxam ID		RE9045			RE9046			RE9047		
Sampling Date		2017/06/01 10:20			2017/06/01 09:45			2017/06/01 10:00		
COC Number		523760-03-01			523760-03-01			523760-03-01		
	UNITS	MW-22B	RDL	QC Batch	MW-23A	RDL	QC Batch	MW-23B	RDL	QC Batch
Demand Parameters										
Total Chemical Oxygen Demand	mg/L	20	5.0	8652761	57	5.0	8653178	22	5.0	8652761
Misc. Inorganics										
Dissolved Organic Carbon (C)	mg/L	6.6	0.50	8657532	21 (1)	1.0	8657532	9.5	0.50	8657532
Nutrients										
Total Ammonia (N)	mg/L	0.040	0.015	8653736	0.93	0.015	8653736	0.39	0.015	8653709
Total Total Kjeldahl Nitrogen	mg/L	0.32	0.050	8655308	1.6	0.050	8655308	0.67	0.050	8655308
RDL = Reportable Detection Limit										
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.										

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RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		RE9048	RE9049		RE9050		RE9051		
Sampling Date		2017/06/01 11:20	2017/06/01 11:40		2017/06/01 12:10		2017/06/01 12:00		
COC Number		523760-03-01	523760-03-01		523760-04-01		523760-04-01		
	UNITS	MW-25B	MW-26B	QC Batch	MW-27A	QC Batch	MW-27B	RDL	QC Batch
Demand Parameters									
Total Chemical Oxygen Demand	mg/L	27	28	8652761	30	8652761	43	5.0	8653178
Misc. Inorganics									
Dissolved Organic Carbon (C)	mg/L	12	12	8657532	14	8657532	18	0.50	8657532
Nutrients									
Total Ammonia (N)	mg/L	0.44	0.66	8653736	0.86	8655352	0.67	0.015	8653736
Total Total Kjeldahl Nitrogen	mg/L	0.87	0.99	8655308	1.2	8655308	1.4	0.050	8655308
RDL = Reportable Detection Limit									

Maxxam ID		RE9052			RE9053			RE9054		
Sampling Date		2017/06/01 12:35			2017/06/01 12:45			2017/06/01 13:15		
COC Number		523760-04-01			523760-04-01			523760-04-01		
	UNITS	MW-28A	RDL	QC Batch	MW-28B	RDL	QC Batch	MW-29A	RDL	QC Batch
Demand Parameters										
Total Chemical Oxygen Demand	mg/L	28	5.0	8653178	35	5.0	8653178	25	5.0	8653880
Misc. Inorganics										
Dissolved Organic Carbon (C)	mg/L	12	0.50	8657532	17	0.50	8657532	9.1	0.50	8657532
Nutrients										
Total Ammonia (N)	mg/L	1.4	0.015	8653736	1.6	0.015	8653704	1.4	0.015	8653704
Total Total Kjeldahl Nitrogen	mg/L	1.6	0.050	8655308	2.1 (1)	0.25	8655308	1.6	0.050	8655308
RDL = Reportable Detection Limit (1) Detection limits raised due to dilution to bring analyte within the calibrated range.										

Maxxam ID		RE9055		RE9056		RE9057		RE9058		
Sampling Date		2017/06/01 13:30		2017/06/01 13:35		2017/06/01 13:45		2017/06/01 14:45		
COC Number		523760-04-01		523760-04-01		523760-04-01		523760-04-01		
	UNITS	MW-29B	QC Batch	MW-30A	QC Batch	MW-30B	QC Batch	MW-31B	RDL	QC Batch
Demand Parameters										
Total Chemical Oxygen Demand	mg/L	45	8653880	23	8653880	38	8653880	30	5.0	8653880
Misc. Inorganics										
Dissolved Organic Carbon (C)	mg/L	18	8657534	7.8	8657534	10	8657534	8.8	0.50	8657534
Nutrients										
Total Ammonia (N)	mg/L	1.4	8653736	0.46	8655352	<0.015	8653736	0.034	0.015	8655352
Total Total Kjeldahl Nitrogen	mg/L	1.8	8655308	0.80	8655879	0.60	8655879	0.51	0.050	8655879
RDL = Reportable Detection Limit										

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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		RE9059		RE9060	RE9061			RE9062		
Sampling Date		2017/06/01 14:20		2017/06/01 14:30	2017/06/01 09:30			2017/06/01		
COC Number		523760-05-01		523760-05-01	523760-05-01			523760-06-01		
	UNITS	MW-32A	RDL	MW-32B	MW-35B	RDL	QC Batch	17DUPLICATE 1	RDL	QC Batch
Demand Parameters										
Total Chemical Oxygen Demand	mg/L	19	5.0	74	66	5.0	8653880	30	5.0	8653880
Misc. Inorganics										
Dissolved Organic Carbon (C)	mg/L	7.2	0.50	17	12	0.50	8657534	6.6	0.50	8657534
Nutrients										
Total Ammonia (N)	mg/L	3.2 (1)	0.075	1.5	2.0	0.015	8653704	0.039	0.015	8653709
Total Total Kjeldahl Nitrogen	mg/L	3.2 (1)	0.25	2.3 (1)	2.5 (1)	0.25	8655879	0.36	0.050	8655879

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

Maxxam ID		RE9063			RE9064		
Sampling Date		2017/06/01			2017/06/01		
COC Number		523760-06-01			523760-06-01		
	UNITS	17DUPLICATE 2	RDL	QC Batch	17DUPLICATE 3	RDL	QC Batch
Demand Parameters							
Total Chemical Oxygen Demand	mg/L	25	5.0	8653880	41	5.0	8653880
Misc. Inorganics							
Dissolved Organic Carbon (C)	mg/L	11	0.50	8657534	17	0.50	8657534
Nutrients							
Total Ammonia (N)	mg/L	0.55	0.015	8653709	1.6	0.015	8653736
Total Total Kjeldahl Nitrogen	mg/L	0.91	0.050	8655879	2.2 (1)	0.25	8655879

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

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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		RE9048	RE9049	RE9051		
Sampling Date		2017/06/01 11:20	2017/06/01 11:40	2017/06/01 12:00		
COC Number		523760-03-01	523760-03-01	523760-04-01		
	UNITS	MW-25B	MW-26B	MW-27B	RDL	QC Batch
Polycyclic Aromatics						
Benzo[a]pyrene equivalency	ug/L	<0.010	<0.010	<0.010	0.010	8650977
Acenaphthene	ug/L	<0.10	<0.10	<0.10	0.10	8643818
Acenaphthylene	ug/L	<0.10	<0.10	<0.10	0.10	8643818
Acridine	ug/L	<0.050	<0.050	<0.050	0.050	8643818
Anthracene	ug/L	<0.010	<0.010	<0.010	0.010	8643818
Benzo(a)anthracene	ug/L	<0.0085	<0.0085	<0.0085	0.0085	8643818
Benzo(b&j)fluoranthene	ug/L	<0.0085	<0.0085	<0.0085	0.0085	8643818
Benzo(k)fluoranthene	ug/L	<0.0085	<0.0085	<0.0085	0.0085	8643818
Benzo(g,h,i)perylene	ug/L	<0.0085	<0.0085	<0.0085	0.0085	8643818
Benzo(c)phenanthrene	ug/L	<0.050	<0.050	<0.050	0.050	8643818
Benzo(a)pyrene	ug/L	<0.0075	<0.0075	<0.0075	0.0075	8643818
Benzo[e]pyrene	ug/L	<0.050	<0.050	<0.050	0.050	8643818
Chrysene	ug/L	<0.0085	<0.0085	<0.0085	0.0085	8643818
Dibenz(a,h)anthracene	ug/L	<0.0075	<0.0075	<0.0075	0.0075	8643818
Fluoranthene	ug/L	<0.010	<0.010	<0.010	0.010	8643818
Fluorene	ug/L	<0.050	<0.050	<0.050	0.050	8643818
Indeno(1,2,3-cd)pyrene	ug/L	<0.0085	<0.0085	<0.0085	0.0085	8643818
2-Methylnaphthalene	ug/L	<0.10	<0.10	<0.10	0.10	8643818
Naphthalene	ug/L	<0.10	<0.10	<0.10	0.10	8643818
Phenanthrene	ug/L	<0.050	<0.050	<0.050	0.050	8643818
Perylene	ug/L	<0.050	<0.050	<0.050	0.050	8643818
Pyrene	ug/L	<0.020	<0.020	<0.020	0.020	8643818
Quinoline	ug/L	<0.20	<0.20	<0.20	0.20	8643818
Surrogate Recovery (%)						
D10-ANTHRACENE (sur.)	%	96	90	90	N/A	8643818
D8-ACENAPHTHYLENE (sur.)	%	94	87	88	N/A	8643818
D8-NAPHTHALENE (sur.)	%	83	76	78	N/A	8643818
TERPHENYL-D14 (sur.)	%	103	97	93	N/A	8643818

RDL = Reportable Detection Limit
N/A = Not Applicable

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		RE9030	RE9031	RE9039	RE9040	RE9041	RE9042		
Sampling Date		2017/06/01 15:25	2017/06/01 15:35	2017/06/01 16:00	2017/06/01 15:05	2017/06/01 15:15	2017/06/01 10:50		
COC Number		523760-01-01	523760-01-01	523760-02-01	523760-02-01	523760-02-01	523760-02-01		
	UNITS	MW-18A	MW-18B	MW-1C	MW-19A	MW-19B	MW-20B	RDL	QC Batch
Low Level Elements									
Dissolved Mercury (Hg)	ug/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8656315
RDL = Reportable Detection Limit									

Maxxam ID		RE9043	RE9044	RE9045	RE9046	RE9047	RE9048		
Sampling Date		2017/06/01 11:00	2017/06/01 10:10	2017/06/01 10:20	2017/06/01 09:45	2017/06/01 10:00	2017/06/01 11:20		
COC Number		523760-03-01	523760-03-01	523760-03-01	523760-03-01	523760-03-01	523760-03-01		
	UNITS	MW-21B	MW-22A	MW-22B	MW-23A	MW-23B	MW-25B	RDL	QC Batch
Low Level Elements									
Dissolved Mercury (Hg)	ug/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8656315
RDL = Reportable Detection Limit									

Maxxam ID		RE9049	RE9050	RE9051	RE9052	RE9053	RE9054		
Sampling Date		2017/06/01 11:40	2017/06/01 12:10	2017/06/01 12:00	2017/06/01 12:35	2017/06/01 12:45	2017/06/01 13:15		
COC Number		523760-03-01	523760-04-01	523760-04-01	523760-04-01	523760-04-01	523760-04-01		
	UNITS	MW-26B	MW-27A	MW-27B	MW-28A	MW-28B	MW-29A	RDL	QC Batch
Low Level Elements									
Dissolved Mercury (Hg)	ug/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8656315
RDL = Reportable Detection Limit									

Maxxam ID		RE9055	RE9056		RE9057	RE9058	RE9059		
Sampling Date		2017/06/01 13:30	2017/06/01 13:35		2017/06/01 13:45	2017/06/01 14:45	2017/06/01 14:20		
COC Number		523760-04-01	523760-04-01		523760-04-01	523760-04-01	523760-05-01		
	UNITS	MW-29B	MW-30A	QC Batch	MW-30B	MW-31B	MW-32A	RDL	QC Batch
Low Level Elements									
Dissolved Mercury (Hg)	ug/L	<0.0020	<0.0020	8656315	<0.0020	<0.0020	<0.0020	0.0020	8656321
RDL = Reportable Detection Limit									

Maxxam ID		RE9060	RE9061	RE9062	RE9063	RE9064		
Sampling Date		2017/06/01 14:30	2017/06/01 09:30	2017/06/01	2017/06/01	2017/06/01		
COC Number		523760-05-01	523760-05-01	523760-06-01	523760-06-01	523760-06-01		
	UNITS	MW-32B	MW-35B	17DUPLICATE 1	17DUPLICATE 2	17DUPLICATE 3	RDL	QC Batch
Low Level Elements								
Dissolved Mercury (Hg)	ug/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8656321
RDL = Reportable Detection Limit								

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Maxxam Job #: B743380
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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

GENERAL COMMENTS

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

Package 1	6.7°C
Package 2	10.0°C
Package 3	8.0°C
Package 4	5.3°C
Package 5	10.7°C

Sample RE9030 [MW-18A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9031 [MW-18B] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9039 [MW-1C] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.
Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample RE9040 [MW-19A] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9041 [MW-19B] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample RE9042 [MW-20B] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample RE9043 [MW-21B] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9044 [MW-22A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample RE9045 [MW-22B] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9046 [MW-23A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9047 [MW-23B] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9048 [MW-25B] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9049 [MW-26B] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

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Sample RE9050 [MW-27A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9051 [MW-27B] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9052 [MW-28A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9053 [MW-28B] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9054 [MW-29A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9055 [MW-29B] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9056 [MW-30A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9057 [MW-30B] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9058 [MW-31B] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9059 [MW-32A] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9060 [MW-32B] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9061 [MW-35B] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9062 [17DUPLICATE 1] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9063 [17DUPLICATE 2] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RE9064 [17DUPLICATE 3] : Detection limits raised due to sample matrix. Parameters affected are B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Results relate only to the items tested.

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8643818	BC5	Matrix Spike	D10-ANTHRACENE (sur.)	2017/05/30		88	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2017/05/30		89	%	50 - 130
			D8-NAPHTHALENE (sur.)	2017/05/30		66	%	50 - 130
			TERPHENYL-D14 (sur.)	2017/05/30		74	%	50 - 130
			Acenaphthene	2017/05/30		87	%	50 - 130
			Acenaphthylene	2017/05/30		92	%	50 - 130
			Acridine	2017/05/30		102	%	50 - 130
			Anthracene	2017/05/30		91	%	50 - 130
			Benzo(a)anthracene	2017/05/30		86	%	50 - 130
			Benzo(b&j)fluoranthene	2017/05/30		74	%	50 - 130
			Benzo(k)fluoranthene	2017/05/30		76	%	50 - 130
			Benzo(g,h,i)perylene	2017/05/30		67	%	50 - 130
			Benzo(c)phenanthrene	2017/05/30		105	%	50 - 130
			Benzo(a)pyrene	2017/05/30		71	%	50 - 130
			Benzo[e]pyrene	2017/05/30		75	%	50 - 130
			Chrysene	2017/05/30		75	%	50 - 130
			Dibenz(a,h)anthracene	2017/05/30		63	%	50 - 130
			Fluoranthene	2017/05/30		102	%	50 - 130
			Fluorene	2017/05/30		94	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/05/30		60	%	50 - 130
			2-Methylnaphthalene	2017/05/30		NC	%	50 - 130
			Naphthalene	2017/05/30		NC	%	50 - 130
			Phenanthrene	2017/05/30		83	%	50 - 130
			Perylene	2017/05/30		70	%	50 - 130
			Pyrene	2017/05/30		94	%	50 - 130
			Quinoline	2017/05/30		122	%	50 - 130
8643818	BC5	Spiked Blank	D10-ANTHRACENE (sur.)	2017/05/31		89	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2017/05/31		91	%	50 - 130
			D8-NAPHTHALENE (sur.)	2017/05/31		82	%	50 - 130
			TERPHENYL-D14 (sur.)	2017/05/31		91	%	50 - 130
			Acenaphthene	2017/05/31		82	%	50 - 130
			Acenaphthylene	2017/05/31		87	%	50 - 130
			Acridine	2017/05/31		88	%	50 - 130
			Anthracene	2017/05/31		89	%	50 - 130
			Benzo(a)anthracene	2017/05/31		104	%	50 - 130
			Benzo(b&j)fluoranthene	2017/05/31		99	%	50 - 130
			Benzo(k)fluoranthene	2017/05/31		97	%	50 - 130
			Benzo(g,h,i)perylene	2017/05/31		91	%	50 - 130
			Benzo(c)phenanthrene	2017/05/31		107	%	50 - 130
			Benzo(a)pyrene	2017/05/31		99	%	50 - 130
			Benzo[e]pyrene	2017/05/31		100	%	50 - 130
			Chrysene	2017/05/31		95	%	50 - 130
			Dibenz(a,h)anthracene	2017/05/31		88	%	50 - 130
			Fluoranthene	2017/05/31		115	%	50 - 130
			Fluorene	2017/05/31		91	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/05/31		86	%	50 - 130
			2-Methylnaphthalene	2017/05/31		83	%	50 - 130
			Naphthalene	2017/05/31		79	%	50 - 130
			Phenanthrene	2017/05/31		87	%	50 - 130
			Perylene	2017/05/31		94	%	50 - 130
			Pyrene	2017/05/31		108	%	50 - 130
			Quinoline	2017/05/31		108	%	50 - 130
8643818	BC5	Method Blank	D10-ANTHRACENE (sur.)	2017/05/31		94	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2017/05/31		96	%	50 - 130
			D8-NAPHTHALENE (sur.)	2017/05/31		86	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			TERPHENYL-D14 (sur.)	2017/05/31		98	%	50 - 130
			Acenaphthene	2017/05/31	<0.10		ug/L	
			Acenaphthylene	2017/05/31	<0.10		ug/L	
			Acridine	2017/05/31	<0.050		ug/L	
			Anthracene	2017/05/31	<0.010		ug/L	
			Benzo(a)anthracene	2017/05/31	<0.0085		ug/L	
			Benzo(b&j)fluoranthene	2017/05/31	<0.0085		ug/L	
			Benzo(k)fluoranthene	2017/05/31	<0.0085		ug/L	
			Benzo(g,h,i)perylene	2017/05/31	<0.0085		ug/L	
			Benzo(c)phenanthrene	2017/05/31	<0.050		ug/L	
			Benzo(a)pyrene	2017/05/31	<0.0075		ug/L	
			Benzo[e]pyrene	2017/05/31	<0.050		ug/L	
			Chrysene	2017/05/31	<0.0085		ug/L	
			Dibenz(a,h)anthracene	2017/05/31	<0.0075		ug/L	
			Fluoranthene	2017/05/31	<0.010		ug/L	
			Fluorene	2017/05/31	<0.050		ug/L	
			Indeno(1,2,3-cd)pyrene	2017/05/31	<0.0085		ug/L	
			2-Methylnaphthalene	2017/05/31	<0.10		ug/L	
			Naphthalene	2017/05/31	<0.10		ug/L	
			Phenanthrene	2017/05/31	<0.050		ug/L	
			Perylene	2017/05/31	<0.050		ug/L	
			Pyrene	2017/05/31	<0.020		ug/L	
			Quinoline	2017/05/31	<0.20		ug/L	
8643818	BC5	RPD	Acenaphthene	2017/05/31	NC		%	30
			Acenaphthylene	2017/05/31	NC		%	30
			Anthracene	2017/05/31	NC		%	30
			Benzo(a)anthracene	2017/05/31	11		%	30
			Benzo(b&j)fluoranthene	2017/05/31	23		%	30
			Benzo(k)fluoranthene	2017/05/31	4.3		%	30
			Benzo(g,h,i)perylene	2017/05/31	NC		%	30
			Benzo(a)pyrene	2017/05/31	34 (1)		%	30
			Chrysene	2017/05/31	23		%	30
			Dibenz(a,h)anthracene	2017/05/31	NC		%	30
			Fluoranthene	2017/05/31	18		%	30
			Fluorene	2017/05/31	NC		%	30
			Indeno(1,2,3-cd)pyrene	2017/05/31	23		%	30
			Naphthalene	2017/05/31	NC		%	30
			Phenanthrene	2017/05/31	26		%	30
			Pyrene	2017/05/31	7.1		%	30
8651106	KHO	Matrix Spike	O-TERPHENYL (sur.)	2017/06/03		110	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/03		124	%	60 - 130
8651106	KHO	Spiked Blank	O-TERPHENYL (sur.)	2017/06/03		97	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/03		113	%	70 - 130
8651106	KHO	Method Blank	O-TERPHENYL (sur.)	2017/06/03		106	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/03	<0.10		mg/L	
8651106	KHO	RPD	F2 (C10-C16 Hydrocarbons)	2017/06/03	NC		%	30
8651120	KK5	Matrix Spike [RE9031-07]	O-TERPHENYL (sur.)	2017/06/05		110	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/05		122	%	60 - 130
8651120	KK5	Spiked Blank	O-TERPHENYL (sur.)	2017/06/05		106	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/05		118	%	70 - 130
8651120	KK5	Method Blank	O-TERPHENYL (sur.)	2017/06/05		96	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/05	<0.10		mg/L	
8651120	KK5	RPD [RE9030-07]	F2 (C10-C16 Hydrocarbons)	2017/06/05	NC		%	30
8651126	GG3	Matrix Spike	O-TERPHENYL (sur.)	2017/06/06		105	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/06		121	%	60 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8651126	GG3	Spiked Blank	O-TERPHENYL (sur.)	2017/06/05		92	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/05		107	%	70 - 130
8651126	GG3	Method Blank	O-TERPHENYL (sur.)	2017/06/05		93	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/05	<0.10		mg/L	
8651126	GG3	RPD	F2 (C10-C16 Hydrocarbons)	2017/06/05	NC		%	30
8651256	SB8	Matrix Spike	1,4-Difluorobenzene (sur.)	2017/06/04		99	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/04		96	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/04		96	%	70 - 130
			Benzene	2017/06/04		97	%	70 - 130
			Toluene	2017/06/04		106	%	70 - 130
			Ethylbenzene	2017/06/04		95	%	70 - 130
			m & p-Xylene	2017/06/04		94	%	70 - 130
			o-Xylene	2017/06/04		100	%	70 - 130
			F1 (C6-C10)	2017/06/04		69 (1)	%	70 - 130
8651256	SB8	Spiked Blank	1,4-Difluorobenzene (sur.)	2017/06/04		87	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/04		95	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/04		79	%	70 - 130
			Benzene	2017/06/04		85	%	70 - 130
			Toluene	2017/06/04		91	%	70 - 130
			Ethylbenzene	2017/06/04		98	%	70 - 130
			m & p-Xylene	2017/06/04		96	%	70 - 130
			o-Xylene	2017/06/04		102	%	70 - 130
			F1 (C6-C10)	2017/06/04		108	%	70 - 130
8651256	SB8	Method Blank	1,4-Difluorobenzene (sur.)	2017/06/04		85	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/04		101	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/04		79	%	70 - 130
			Benzene	2017/06/04	<0.00040		mg/L	
			Toluene	2017/06/04	<0.00040		mg/L	
			Ethylbenzene	2017/06/04	<0.00040		mg/L	
			m & p-Xylene	2017/06/04	<0.00080		mg/L	
			o-Xylene	2017/06/04	<0.00040		mg/L	
			Xylenes (Total)	2017/06/04	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2017/06/04	<0.10		mg/L	
			F1 (C6-C10)	2017/06/04	<0.10		mg/L	
8651256	SB8	RPD	Benzene	2017/06/04	NC		%	30
			Toluene	2017/06/04	5.0		%	30
			Ethylbenzene	2017/06/04	NC		%	30
			m & p-Xylene	2017/06/04	NC		%	30
			o-Xylene	2017/06/04	NC		%	30
			Xylenes (Total)	2017/06/04	NC		%	30
			F1 (C6-C10) - BTEX	2017/06/04	NC		%	30
			F1 (C6-C10)	2017/06/04	NC		%	30
8651260	SES	Matrix Spike [RE9031-06]	1,4-Difluorobenzene (sur.)	2017/06/04		98	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/04		104	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/04		104	%	70 - 130
			Benzene	2017/06/04		98	%	70 - 130
			Toluene	2017/06/04		95	%	70 - 130
			Ethylbenzene	2017/06/04		96	%	70 - 130
			m & p-Xylene	2017/06/04		98	%	70 - 130
			o-Xylene	2017/06/04		102	%	70 - 130
			F1 (C6-C10)	2017/06/04		87	%	70 - 130
8651260	SES	Spiked Blank	1,4-Difluorobenzene (sur.)	2017/06/04		96	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/04		105	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/04		104	%	70 - 130
			Benzene	2017/06/04		97	%	70 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Toluene	2017/06/04		94	%	70 - 130
			Ethylbenzene	2017/06/04		95	%	70 - 130
			m & p-Xylene	2017/06/04		99	%	70 - 130
			o-Xylene	2017/06/04		102	%	70 - 130
			F1 (C6-C10)	2017/06/04		111	%	70 - 130
8651260	SES	Method Blank	1,4-Difluorobenzene (sur.)	2017/06/05		101	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/05		97	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/05		99	%	70 - 130
			Benzene	2017/06/05	<0.00040		mg/L	
			Toluene	2017/06/05	<0.00040		mg/L	
			Ethylbenzene	2017/06/05	<0.00040		mg/L	
			m & p-Xylene	2017/06/05	<0.00080		mg/L	
			o-Xylene	2017/06/05	<0.00040		mg/L	
			Xylenes (Total)	2017/06/05	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2017/06/05	<0.10		mg/L	
			F1 (C6-C10)	2017/06/05	<0.10		mg/L	
8651260	SES	RPD [RE9030-06]	Benzene	2017/06/04	NC		%	30
			Toluene	2017/06/04	NC		%	30
			Ethylbenzene	2017/06/04	NC		%	30
			m & p-Xylene	2017/06/04	NC		%	30
			o-Xylene	2017/06/04	NC		%	30
			Xylenes (Total)	2017/06/04	NC		%	30
			F1 (C6-C10) - BTEX	2017/06/04	NC		%	30
			F1 (C6-C10)	2017/06/04	NC		%	30
8651679	KD5	Matrix Spike	Dissolved Nitrite (N)	2017/06/08		109	%	80 - 120
			Dissolved Nitrate (N)	2017/06/08		101	%	80 - 120
8651679	KD5	Spiked Blank	Dissolved Nitrite (N)	2017/06/08		103	%	80 - 120
			Dissolved Nitrate (N)	2017/06/08		103	%	80 - 120
8651679	KD5	Method Blank	Dissolved Nitrite (N)	2017/06/08	<0.010		mg/L	
			Dissolved Nitrate (N)	2017/06/08	<0.010		mg/L	
8651679	KD5	RPD	Dissolved Nitrite (N)	2017/06/08	NC		%	20
			Dissolved Nitrate (N)	2017/06/08	1.6		%	20
8651681	KD5	Matrix Spike [RE9052-01]	Dissolved Nitrite (N)	2017/06/08		106	%	80 - 120
			Dissolved Nitrate (N)	2017/06/08		106	%	80 - 120
8651681	KD5	Spiked Blank	Dissolved Nitrite (N)	2017/06/08		98	%	80 - 120
			Dissolved Nitrate (N)	2017/06/08		98	%	80 - 120
8651681	KD5	Method Blank	Dissolved Nitrite (N)	2017/06/08	<0.010		mg/L	
			Dissolved Nitrate (N)	2017/06/08	<0.010		mg/L	
8651681	KD5	RPD [RE9052-01]	Dissolved Nitrite (N)	2017/06/08	NC		%	20
			Dissolved Nitrate (N)	2017/06/08	0.20		%	20
8651684	SES	Matrix Spike [RE9062-06]	1,4-Difluorobenzene (sur.)	2017/06/05		98	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/05		96	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/05		103	%	70 - 130
			Benzene	2017/06/05		100	%	70 - 130
			Toluene	2017/06/05		98	%	70 - 130
			Ethylbenzene	2017/06/05		100	%	70 - 130
			m & p-Xylene	2017/06/05		102	%	70 - 130
			o-Xylene	2017/06/05		106	%	70 - 130
			F1 (C6-C10)	2017/06/05		74	%	70 - 130
8651684	SES	Spiked Blank	1,4-Difluorobenzene (sur.)	2017/06/04		97	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/04		104	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/04		99	%	70 - 130
			Benzene	2017/06/04		95	%	70 - 130
			Toluene	2017/06/04		93	%	70 - 130
			Ethylbenzene	2017/06/04		95	%	70 - 130

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			m & p-Xylene	2017/06/04		98	%	70 - 130
			o-Xylene	2017/06/04		101	%	70 - 130
			F1 (C6-C10)	2017/06/04		99	%	70 - 130
8651684	SES	Method Blank	1,4-Difluorobenzene (sur.)	2017/06/04		104	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/04		105	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/04		99	%	70 - 130
			Benzene	2017/06/04	<0.00040		mg/L	
			Toluene	2017/06/04	<0.00040		mg/L	
			Ethylbenzene	2017/06/04	<0.00040		mg/L	
			m & p-Xylene	2017/06/04	<0.00080		mg/L	
			o-Xylene	2017/06/04	<0.00040		mg/L	
			Xylenes (Total)	2017/06/04	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2017/06/04	<0.10		mg/L	
			F1 (C6-C10)	2017/06/04	<0.10		mg/L	
8651684	SES	RPD	Benzene	2017/06/04	NC		%	30
			Toluene	2017/06/04	29		%	30
			Ethylbenzene	2017/06/04	NC		%	30
			m & p-Xylene	2017/06/04	NC		%	30
			o-Xylene	2017/06/04	NC		%	30
			Xylenes (Total)	2017/06/04	NC		%	30
			F1 (C6-C10) - BTEX	2017/06/04	NC		%	30
			F1 (C6-C10)	2017/06/04	NC		%	30
8652761	MRD	Matrix Spike	Total Chemical Oxygen Demand	2017/06/05		102	%	80 - 120
8652761	MRD	Spiked Blank	Total Chemical Oxygen Demand	2017/06/05		101	%	80 - 120
8652761	MRD	Method Blank	Total Chemical Oxygen Demand	2017/06/05	<5.0		mg/L	
8652761	MRD	RPD	Total Chemical Oxygen Demand	2017/06/05	4.4		%	20
8652846	KD5	Matrix Spike [RE9040-01]	Dissolved Chloride (Cl)	2017/06/08		104	%	80 - 120
8652846	KD5	Spiked Blank	Dissolved Chloride (Cl)	2017/06/08		103	%	80 - 120
8652846	KD5	Method Blank	Dissolved Chloride (Cl)	2017/06/08	<1.0		mg/L	
8652846	KD5	RPD [RE9040-01]	Dissolved Chloride (Cl)	2017/06/08	0.64		%	20
8652850	KD5	Matrix Spike [RE9040-01]	Dissolved Sulphate (SO4)	2017/06/08		NC	%	80 - 120
8652850	KD5	Spiked Blank	Dissolved Sulphate (SO4)	2017/06/08		103	%	80 - 120
8652850	KD5	Method Blank	Dissolved Sulphate (SO4)	2017/06/08	<1.0		mg/L	
8652850	KD5	RPD [RE9040-01]	Dissolved Sulphate (SO4)	2017/06/08	0.29		%	20
8652855	KD5	Matrix Spike [RE9060-01]	Dissolved Chloride (Cl)	2017/06/07		NC	%	80 - 120
8652855	KD5	Spiked Blank	Dissolved Chloride (Cl)	2017/06/07		105	%	80 - 120
8652855	KD5	Method Blank	Dissolved Chloride (Cl)	2017/06/07	<1.0		mg/L	
8652855	KD5	RPD [RE9060-01]	Dissolved Chloride (Cl)	2017/06/07	1.3		%	20
8652859	KD5	Matrix Spike [RE9060-01]	Dissolved Sulphate (SO4)	2017/06/07		NC	%	80 - 120
8652859	KD5	Spiked Blank	Dissolved Sulphate (SO4)	2017/06/07		100	%	80 - 120
8652859	KD5	Method Blank	Dissolved Sulphate (SO4)	2017/06/07	<1.0		mg/L	
8652859	KD5	RPD [RE9060-01]	Dissolved Sulphate (SO4)	2017/06/07	2.7		%	20
8652862	CH7	Matrix Spike [RE9063-01]	Dissolved Chloride (Cl)	2017/06/07		108	%	80 - 120
8652862	CH7	Spiked Blank	Dissolved Chloride (Cl)	2017/06/07		105	%	80 - 120
8652862	CH7	Method Blank	Dissolved Chloride (Cl)	2017/06/07	<1.0		mg/L	
8652862	CH7	RPD [RE9063-01]	Dissolved Chloride (Cl)	2017/06/07	0.21		%	20
8652867	CH7	Matrix Spike [RE9063-01]	Dissolved Sulphate (SO4)	2017/06/07		NC	%	80 - 120
8652867	CH7	Spiked Blank	Dissolved Sulphate (SO4)	2017/06/07		108	%	80 - 120
8652867	CH7	Method Blank	Dissolved Sulphate (SO4)	2017/06/07	<1.0		mg/L	
8652867	CH7	RPD [RE9063-01]	Dissolved Sulphate (SO4)	2017/06/07	0.37		%	20
8653178	MRD	Matrix Spike [RE9053-04]	Total Chemical Oxygen Demand	2017/06/06		101	%	80 - 120
8653178	MRD	Spiked Blank	Total Chemical Oxygen Demand	2017/06/06		101	%	80 - 120
8653178	MRD	Method Blank	Total Chemical Oxygen Demand	2017/06/06	<5.0		mg/L	
8653178	MRD	RPD [RE9053-04]	Total Chemical Oxygen Demand	2017/06/06	0		%	20
8653201	MA4	Spiked Blank	pH	2017/06/06		100	%	97 - 103

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8653201	MA4	RPD [RE9063-01]	pH	2017/06/06	0.39		%	N/A
8653213	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2017/06/06		101	%	80 - 120
8653213	MA4	Method Blank	Alkalinity (PP as CaCO3)	2017/06/06	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2017/06/06	<0.50		mg/L	
			Bicarbonate (HCO3)	2017/06/06	<0.50		mg/L	
			Carbonate (CO3)	2017/06/06	<0.50		mg/L	
			Hydroxide (OH)	2017/06/06	<0.50		mg/L	
8653213	MA4	RPD [RE9063-01]	Alkalinity (PP as CaCO3)	2017/06/06	NC		%	20
			Alkalinity (Total as CaCO3)	2017/06/06	0.15		%	20
			Bicarbonate (HCO3)	2017/06/06	0.15		%	20
			Carbonate (CO3)	2017/06/06	NC		%	20
			Hydroxide (OH)	2017/06/06	NC		%	20
8653214	MA4	Spiked Blank	Conductivity	2017/06/06		98	%	90 - 110
8653214	MA4	Method Blank	Conductivity	2017/06/06	<1.0		uS/cm	
8653214	MA4	RPD [RE9063-01]	Conductivity	2017/06/06	0.27		%	10
8653215	MA4	Spiked Blank	pH	2017/06/06		100	%	97 - 103
8653215	MA4	RPD [RE9030-01]	pH	2017/06/06	0.45		%	N/A
8653242	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2017/06/06		102	%	80 - 120
8653242	MA4	Method Blank	Alkalinity (PP as CaCO3)	2017/06/06	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2017/06/06	<0.50		mg/L	
			Bicarbonate (HCO3)	2017/06/06	<0.50		mg/L	
			Carbonate (CO3)	2017/06/06	<0.50		mg/L	
			Hydroxide (OH)	2017/06/06	<0.50		mg/L	
8653242	MA4	RPD [RE9030-01]	Alkalinity (PP as CaCO3)	2017/06/06	8.5		%	20
			Alkalinity (Total as CaCO3)	2017/06/06	0.48		%	20
			Bicarbonate (HCO3)	2017/06/06	0.81		%	20
			Carbonate (CO3)	2017/06/06	8.5		%	20
			Hydroxide (OH)	2017/06/06	NC		%	20
8653243	MA4	Spiked Blank	Conductivity	2017/06/06		99	%	90 - 110
8653243	MA4	Method Blank	Conductivity	2017/06/06	<1.0		uS/cm	
8653243	MA4	RPD [RE9030-01]	Conductivity	2017/06/06	0.067		%	10
8653704	AF6	Matrix Spike	Total Ammonia (N)	2017/06/09		104	%	80 - 120
8653704	AF6	Spiked Blank	Total Ammonia (N)	2017/06/09		105	%	80 - 120
8653704	AF6	Method Blank	Total Ammonia (N)	2017/06/09	<0.015		mg/L	
8653704	AF6	RPD	Total Ammonia (N)	2017/06/09	NC		%	20
8653708	SES	Matrix Spike	1,4-Difluorobenzene (sur.)	2017/06/07		100	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/07		100	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/07		103	%	70 - 130
			Benzene	2017/06/07		105	%	70 - 130
			Toluene	2017/06/07		103	%	70 - 130
			Ethylbenzene	2017/06/07		107	%	70 - 130
			m & p-Xylene	2017/06/07		108	%	70 - 130
			o-Xylene	2017/06/07		109	%	70 - 130
			F1 (C6-C10)	2017/06/07		93	%	70 - 130
8653708	SES	Spiked Blank	1,4-Difluorobenzene (sur.)	2017/06/06		99	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/06		95	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/06		98	%	70 - 130
			Benzene	2017/06/06		91	%	70 - 130
			Toluene	2017/06/06		91	%	70 - 130
			Ethylbenzene	2017/06/06		94	%	70 - 130
			m & p-Xylene	2017/06/06		97	%	70 - 130
			o-Xylene	2017/06/06		98	%	70 - 130
			F1 (C6-C10)	2017/06/06		99	%	70 - 130
8653708	SES	Method Blank	1,4-Difluorobenzene (sur.)	2017/06/06		103	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/06		98	%	70 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			D4-1,2-Dichloroethane (sur.)	2017/06/06		96	%	70 - 130
			Benzene	2017/06/06	<0.00040		mg/L	
			Toluene	2017/06/06	<0.00040		mg/L	
			Ethylbenzene	2017/06/06	<0.00040		mg/L	
			m & p-Xylene	2017/06/06	<0.00080		mg/L	
			o-Xylene	2017/06/06	<0.00040		mg/L	
			Xylenes (Total)	2017/06/06	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2017/06/06	<0.10		mg/L	
			F1 (C6-C10)	2017/06/06	<0.10		mg/L	
8653708	SES	RPD	Benzene	2017/06/06	NC		%	30
			Toluene	2017/06/06	NC		%	30
			Ethylbenzene	2017/06/06	NC		%	30
			m & p-Xylene	2017/06/06	NC		%	30
			o-Xylene	2017/06/06	NC		%	30
			Xylenes (Total)	2017/06/06	NC		%	30
			F1 (C6-C10) - BTEX	2017/06/06	NC		%	30
			F1 (C6-C10)	2017/06/06	NC		%	30
8653709	AF6	Matrix Spike	Total Ammonia (N)	2017/06/12		108	%	80 - 120
8653709	AF6	Spiked Blank	Total Ammonia (N)	2017/06/12		105	%	80 - 120
8653709	AF6	Method Blank	Total Ammonia (N)	2017/06/12	<0.015		mg/L	
8653709	AF6	RPD	Total Ammonia (N)	2017/06/12	NC		%	20
8653736	AF6	Matrix Spike	Total Ammonia (N)	2017/06/12		111	%	80 - 120
8653736	AF6	Spiked Blank	Total Ammonia (N)	2017/06/12		103	%	80 - 120
8653736	AF6	Method Blank	Total Ammonia (N)	2017/06/12	<0.015		mg/L	
8653736	AF6	RPD	Total Ammonia (N)	2017/06/12	7.9		%	20
8653880	MRD	Matrix Spike	Total Chemical Oxygen Demand	2017/06/06		102	%	80 - 120
8653880	MRD	Spiked Blank	Total Chemical Oxygen Demand	2017/06/06		102	%	80 - 120
8653880	MRD	Method Blank	Total Chemical Oxygen Demand	2017/06/06	<5.0		mg/L	
8653880	MRD	RPD	Total Chemical Oxygen Demand	2017/06/06	1.6		%	20
8654122	HM3	Matrix Spike	Dissolved Aluminum (Al)	2017/06/07		94	%	80 - 120
			Dissolved Antimony (Sb)	2017/06/07		100	%	80 - 120
			Dissolved Arsenic (As)	2017/06/07		99	%	80 - 120
			Dissolved Beryllium (Be)	2017/06/07		99	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/07		95	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/07		94	%	80 - 120
			Dissolved Copper (Cu)	2017/06/07		95	%	80 - 120
			Dissolved Lead (Pb)	2017/06/07		96	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/06/07		103	%	80 - 120
			Dissolved Nickel (Ni)	2017/06/07		93	%	80 - 120
			Dissolved Selenium (Se)	2017/06/07		99	%	80 - 120
			Dissolved Silver (Ag)	2017/06/07		94	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/07		95	%	80 - 120
			Dissolved Tin (Sn)	2017/06/07		101	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/07		101	%	80 - 120
			Dissolved Uranium (U)	2017/06/07		97	%	80 - 120
			Dissolved Vanadium (V)	2017/06/07		101	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/07		95	%	80 - 120
8654122	HM3	Spiked Blank	Dissolved Aluminum (Al)	2017/06/07		95	%	80 - 120
			Dissolved Antimony (Sb)	2017/06/07		96	%	80 - 120
			Dissolved Arsenic (As)	2017/06/07		98	%	80 - 120
			Dissolved Beryllium (Be)	2017/06/07		100	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/07		99	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/07		98	%	80 - 120
			Dissolved Copper (Cu)	2017/06/07		99	%	80 - 120
			Dissolved Lead (Pb)	2017/06/07		99	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Molybdenum (Mo)	2017/06/07		99	%	80 - 120
			Dissolved Nickel (Ni)	2017/06/07		98	%	80 - 120
			Dissolved Selenium (Se)	2017/06/07		101	%	80 - 120
			Dissolved Silver (Ag)	2017/06/07		100	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/07		102	%	80 - 120
			Dissolved Tin (Sn)	2017/06/07		97	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/07		95	%	80 - 120
			Dissolved Uranium (U)	2017/06/07		97	%	80 - 120
			Dissolved Vanadium (V)	2017/06/07		101	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/07		98	%	80 - 120
8654122	HM3	Method Blank	Dissolved Aluminum (Al)	2017/06/07	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2017/06/07	<0.00060		mg/L	
			Dissolved Arsenic (As)	2017/06/07	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2017/06/07	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2017/06/07	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2017/06/07	<0.00030		mg/L	
			Dissolved Copper (Cu)	2017/06/07	<0.00020		mg/L	
			Dissolved Lead (Pb)	2017/06/07	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2017/06/07	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2017/06/07	<0.00050		mg/L	
			Dissolved Selenium (Se)	2017/06/07	<0.00020		mg/L	
			Dissolved Silver (Ag)	2017/06/07	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2017/06/07	<0.00020		mg/L	
			Dissolved Tin (Sn)	2017/06/07	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2017/06/07	<0.0010		mg/L	
			Dissolved Uranium (U)	2017/06/07	<0.00010		mg/L	
			Dissolved Vanadium (V)	2017/06/07	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2017/06/07	<0.0030		mg/L	
8654122	HM3	RPD	Dissolved Aluminum (Al)	2017/06/07	2.7		%	20
			Dissolved Antimony (Sb)	2017/06/07	NC		%	20
			Dissolved Arsenic (As)	2017/06/07	NC		%	20
			Dissolved Beryllium (Be)	2017/06/07	NC		%	20
			Dissolved Chromium (Cr)	2017/06/07	NC		%	20
			Dissolved Cobalt (Co)	2017/06/07	6.8		%	20
			Dissolved Copper (Cu)	2017/06/07	1.7		%	20
			Dissolved Lead (Pb)	2017/06/07	NC		%	20
			Dissolved Molybdenum (Mo)	2017/06/07	NC		%	20
			Dissolved Nickel (Ni)	2017/06/07	NC		%	20
			Dissolved Selenium (Se)	2017/06/07	NC		%	20
			Dissolved Silver (Ag)	2017/06/07	NC		%	20
			Dissolved Thallium (Tl)	2017/06/07	NC		%	20
			Dissolved Tin (Sn)	2017/06/07	NC		%	20
			Dissolved Titanium (Ti)	2017/06/07	NC		%	20
			Dissolved Uranium (U)	2017/06/07	NC		%	20
			Dissolved Vanadium (V)	2017/06/07	NC		%	20
			Dissolved Zinc (Zn)	2017/06/07	4.3		%	20
8654128	HM3	Matrix Spike [RE9030-02]	Dissolved Aluminum (Al)	2017/06/07		97	%	80 - 120
			Dissolved Antimony (Sb)	2017/06/07		100	%	80 - 120
			Dissolved Arsenic (As)	2017/06/07		101	%	80 - 120
			Dissolved Beryllium (Be)	2017/06/07		101	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/07		95	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/07		95	%	80 - 120
			Dissolved Copper (Cu)	2017/06/07		96	%	80 - 120
			Dissolved Lead (Pb)	2017/06/07		95	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/06/07		102	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Nickel (Ni)	2017/06/07		95	%	80 - 120
			Dissolved Selenium (Se)	2017/06/07		103	%	80 - 120
			Dissolved Silver (Ag)	2017/06/07		95	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/07		95	%	80 - 120
			Dissolved Tin (Sn)	2017/06/07		101	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/07		95	%	80 - 120
			Dissolved Uranium (U)	2017/06/07		95	%	80 - 120
			Dissolved Vanadium (V)	2017/06/07		101	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/07		98	%	80 - 120
8654128	HM3	Spiked Blank	Dissolved Aluminum (Al)	2017/06/07		97	%	80 - 120
			Dissolved Antimony (Sb)	2017/06/07		96	%	80 - 120
			Dissolved Arsenic (As)	2017/06/07		98	%	80 - 120
			Dissolved Beryllium (Be)	2017/06/07		97	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/07		97	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/07		96	%	80 - 120
			Dissolved Copper (Cu)	2017/06/07		99	%	80 - 120
			Dissolved Lead (Pb)	2017/06/07		100	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/06/07		97	%	80 - 120
			Dissolved Nickel (Ni)	2017/06/07		98	%	80 - 120
			Dissolved Selenium (Se)	2017/06/07		102	%	80 - 120
			Dissolved Silver (Ag)	2017/06/07		100	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/07		101	%	80 - 120
			Dissolved Tin (Sn)	2017/06/07		96	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/07		97	%	80 - 120
			Dissolved Uranium (U)	2017/06/07		96	%	80 - 120
			Dissolved Vanadium (V)	2017/06/07		99	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/07		99	%	80 - 120
8654128	HM3	Method Blank	Dissolved Aluminum (Al)	2017/06/07	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2017/06/07	<0.00060		mg/L	
			Dissolved Arsenic (As)	2017/06/07	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2017/06/07	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2017/06/07	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2017/06/07	<0.00030		mg/L	
			Dissolved Copper (Cu)	2017/06/07	<0.00020		mg/L	
			Dissolved Lead (Pb)	2017/06/07	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2017/06/07	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2017/06/07	<0.00050		mg/L	
			Dissolved Selenium (Se)	2017/06/07	<0.00020		mg/L	
			Dissolved Silver (Ag)	2017/06/07	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2017/06/07	<0.00020		mg/L	
			Dissolved Tin (Sn)	2017/06/07	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2017/06/07	<0.0010		mg/L	
			Dissolved Uranium (U)	2017/06/07	<0.00010		mg/L	
			Dissolved Vanadium (V)	2017/06/07	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2017/06/07	<0.0030		mg/L	
8654128	HM3	RPD [RE9030-02]	Dissolved Aluminum (Al)	2017/06/07	9.3		%	20
			Dissolved Antimony (Sb)	2017/06/07	NC		%	20
			Dissolved Arsenic (As)	2017/06/07	6.6		%	20
			Dissolved Beryllium (Be)	2017/06/07	NC		%	20
			Dissolved Chromium (Cr)	2017/06/07	NC		%	20
			Dissolved Cobalt (Co)	2017/06/07	NC		%	20
			Dissolved Copper (Cu)	2017/06/07	NC		%	20
			Dissolved Lead (Pb)	2017/06/07	NC		%	20
			Dissolved Molybdenum (Mo)	2017/06/07	1.2		%	20
			Dissolved Nickel (Ni)	2017/06/07	7.2		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Selenium (Se)	2017/06/07	NC		%	20
			Dissolved Silver (Ag)	2017/06/07	NC		%	20
			Dissolved Thallium (Tl)	2017/06/07	NC		%	20
			Dissolved Tin (Sn)	2017/06/07	NC		%	20
			Dissolved Titanium (Ti)	2017/06/07	NC		%	20
			Dissolved Uranium (U)	2017/06/07	6.8		%	20
			Dissolved Vanadium (V)	2017/06/07	NC		%	20
			Dissolved Zinc (Zn)	2017/06/07	NC		%	20
8655308	KD5	Matrix Spike [RE9051-04]	Total Total Kjeldahl Nitrogen	2017/06/08		NC	%	80 - 120
8655308	KD5	QC Standard	Total Total Kjeldahl Nitrogen	2017/06/08		95	%	80 - 120
8655308	KD5	Spiked Blank	Total Total Kjeldahl Nitrogen	2017/06/08		107	%	80 - 120
8655308	KD5	Method Blank	Total Total Kjeldahl Nitrogen	2017/06/08	<0.050		mg/L	
8655308	KD5	RPD [RE9051-04]	Total Total Kjeldahl Nitrogen	2017/06/08	0.16		%	20
8655352	AF6	Matrix Spike	Total Ammonia (N)	2017/06/08		100	%	80 - 120
8655352	AF6	Spiked Blank	Total Ammonia (N)	2017/06/08		106	%	80 - 120
8655352	AF6	Method Blank	Total Ammonia (N)	2017/06/08	<0.015		mg/L	
8655352	AF6	RPD	Total Ammonia (N)	2017/06/08	5.4		%	20
8655691	JK9	Matrix Spike [RE9030-02]	Dissolved Barium (Ba)	2017/06/07		102	%	80 - 120
			Dissolved Boron (B)	2017/06/07		102	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/07		98	%	80 - 120
			Dissolved Iron (Fe)	2017/06/07		102	%	80 - 120
			Dissolved Lithium (Li)	2017/06/07		100	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/07		101	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/07		99	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/07		101	%	80 - 120
			Dissolved Potassium (K)	2017/06/07		104	%	80 - 120
			Dissolved Silicon (Si)	2017/06/07		96	%	80 - 120
			Dissolved Sodium (Na)	2017/06/07		NC	%	80 - 120
			Dissolved Strontium (Sr)	2017/06/07		100	%	80 - 120
8655691	JK9	Spiked Blank	Dissolved Barium (Ba)	2017/06/07		101	%	80 - 120
			Dissolved Boron (B)	2017/06/07		103	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/07		102	%	80 - 120
			Dissolved Iron (Fe)	2017/06/07		103	%	80 - 120
			Dissolved Lithium (Li)	2017/06/07		100	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/07		103	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/07		99	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/07		98	%	80 - 120
			Dissolved Potassium (K)	2017/06/07		103	%	80 - 120
			Dissolved Silicon (Si)	2017/06/07		107	%	80 - 120
			Dissolved Sodium (Na)	2017/06/07		102	%	80 - 120
			Dissolved Strontium (Sr)	2017/06/07		100	%	80 - 120
8655691	JK9	Method Blank	Dissolved Barium (Ba)	2017/06/07	<0.010		mg/L	
			Dissolved Boron (B)	2017/06/07	<0.020		mg/L	
			Dissolved Calcium (Ca)	2017/06/07	<0.30		mg/L	
			Dissolved Iron (Fe)	2017/06/07	<0.060		mg/L	
			Dissolved Lithium (Li)	2017/06/07	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2017/06/07	<0.20		mg/L	
			Dissolved Manganese (Mn)	2017/06/07	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2017/06/07	<0.10		mg/L	
			Dissolved Potassium (K)	2017/06/07	<0.30		mg/L	
			Dissolved Silicon (Si)	2017/06/07	<0.10		mg/L	
			Dissolved Sodium (Na)	2017/06/07	<0.50		mg/L	
			Dissolved Strontium (Sr)	2017/06/07	<0.020		mg/L	
			Dissolved Sulphur (S)	2017/06/07	<0.20		mg/L	
8655691	JK9	RPD [RE9030-02]	Dissolved Barium (Ba)	2017/06/07	0.28		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Boron (B)	2017/06/07	0.23		%	20
			Dissolved Calcium (Ca)	2017/06/07	0.095		%	20
			Dissolved Iron (Fe)	2017/06/07	NC		%	20
			Dissolved Lithium (Li)	2017/06/07	2.3		%	20
			Dissolved Magnesium (Mg)	2017/06/07	3.9		%	20
			Dissolved Manganese (Mn)	2017/06/07	0.21		%	20
			Dissolved Phosphorus (P)	2017/06/07	12		%	20
			Dissolved Potassium (K)	2017/06/07	3.0		%	20
			Dissolved Silicon (Si)	2017/06/07	0.087		%	20
			Dissolved Sodium (Na)	2017/06/07	0.35		%	20
			Dissolved Strontium (Sr)	2017/06/07	0.54		%	20
			Dissolved Sulphur (S)	2017/06/07	13		%	20
8655701	JK9	Matrix Spike [RE9057-02]	Dissolved Barium (Ba)	2017/06/08		99	%	80 - 120
			Dissolved Boron (B)	2017/06/08		101	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/08		97	%	80 - 120
			Dissolved Iron (Fe)	2017/06/08		101	%	80 - 120
			Dissolved Lithium (Li)	2017/06/08		97	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/08		99	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/08		97	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/08		101	%	80 - 120
			Dissolved Potassium (K)	2017/06/08		101	%	80 - 120
			Dissolved Silicon (Si)	2017/06/08		93	%	80 - 120
			Dissolved Sodium (Na)	2017/06/08		NC	%	80 - 120
			Dissolved Strontium (Sr)	2017/06/08		96	%	80 - 120
8655701	JK9	Spiked Blank	Dissolved Barium (Ba)	2017/06/07		103	%	80 - 120
			Dissolved Boron (B)	2017/06/07		104	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/07		102	%	80 - 120
			Dissolved Iron (Fe)	2017/06/07		104	%	80 - 120
			Dissolved Lithium (Li)	2017/06/07		102	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/07		104	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/07		100	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/07		99	%	80 - 120
			Dissolved Potassium (K)	2017/06/07		104	%	80 - 120
			Dissolved Silicon (Si)	2017/06/07		108	%	80 - 120
			Dissolved Sodium (Na)	2017/06/07		103	%	80 - 120
			Dissolved Strontium (Sr)	2017/06/07		102	%	80 - 120
8655701	JK9	Method Blank	Dissolved Barium (Ba)	2017/06/07	<0.010		mg/L	
			Dissolved Boron (B)	2017/06/07	<0.020		mg/L	
			Dissolved Calcium (Ca)	2017/06/07	<0.30		mg/L	
			Dissolved Iron (Fe)	2017/06/07	<0.060		mg/L	
			Dissolved Lithium (Li)	2017/06/07	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2017/06/07	<0.20		mg/L	
			Dissolved Manganese (Mn)	2017/06/07	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2017/06/07	<0.10		mg/L	
			Dissolved Potassium (K)	2017/06/07	<0.30		mg/L	
			Dissolved Silicon (Si)	2017/06/07	<0.10		mg/L	
			Dissolved Sodium (Na)	2017/06/07	<0.50		mg/L	
			Dissolved Strontium (Sr)	2017/06/07	<0.020		mg/L	
			Dissolved Sulphur (S)	2017/06/07	<0.20		mg/L	
8655701	JK9	RPD [RE9057-02]	Dissolved Barium (Ba)	2017/06/08	0.70		%	20
			Dissolved Boron (B)	2017/06/08	1.3		%	20
			Dissolved Calcium (Ca)	2017/06/08	0.12		%	20
			Dissolved Iron (Fe)	2017/06/08	NC		%	20
			Dissolved Lithium (Li)	2017/06/08	1.7		%	20
			Dissolved Magnesium (Mg)	2017/06/08	0.50		%	20

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Maxxam Job #: B743380
Report Date: 2017/06/12

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Manganese (Mn)	2017/06/08	NC		%	20
			Dissolved Phosphorus (P)	2017/06/08	2.4		%	20
			Dissolved Potassium (K)	2017/06/08	0.22		%	20
			Dissolved Silicon (Si)	2017/06/08	0.16		%	20
			Dissolved Sodium (Na)	2017/06/08	0.48		%	20
			Dissolved Strontium (Sr)	2017/06/08	0.57		%	20
			Dissolved Sulphur (S)	2017/06/08	0.13		%	20
8655879	KD5	Matrix Spike	Total Total Kjeldahl Nitrogen	2017/06/08		99	%	80 - 120
8655879	KD5	QC Standard	Total Total Kjeldahl Nitrogen	2017/06/08		100	%	80 - 120
8655879	KD5	Spiked Blank	Total Total Kjeldahl Nitrogen	2017/06/08		111	%	80 - 120
8655879	KD5	Method Blank	Total Total Kjeldahl Nitrogen	2017/06/08	<0.050		mg/L	
8655879	KD5	RPD	Total Total Kjeldahl Nitrogen	2017/06/08	1.3		%	20
8656315	NP4	Matrix Spike [RE9030-03]	Dissolved Mercury (Hg)	2017/06/09		98	%	85 - 115
8656315	NP4	QC Standard	Dissolved Mercury (Hg)	2017/06/09		105	%	85 - 115
8656315	NP4	Spiked Blank	Dissolved Mercury (Hg)	2017/06/09		99	%	85 - 115
8656315	NP4	Method Blank	Dissolved Mercury (Hg)	2017/06/09	<0.0020		ug/L	
8656315	NP4	RPD [RE9030-03]	Dissolved Mercury (Hg)	2017/06/09	NC		%	20
8656321	NP4	Matrix Spike [RE9057-03]	Dissolved Mercury (Hg)	2017/06/09		100	%	85 - 115
8656321	NP4	QC Standard	Dissolved Mercury (Hg)	2017/06/09		113	%	85 - 115
8656321	NP4	Spiked Blank	Dissolved Mercury (Hg)	2017/06/09		106	%	85 - 115
8656321	NP4	Method Blank	Dissolved Mercury (Hg)	2017/06/09	<0.0020		ug/L	
8656321	NP4	RPD [RE9057-03]	Dissolved Mercury (Hg)	2017/06/09	NC		%	20
8657060	AF6	Matrix Spike	Total Total Kjeldahl Nitrogen	2017/06/09		NC	%	80 - 120
8657060	AF6	QC Standard	Total Total Kjeldahl Nitrogen	2017/06/09		104	%	80 - 120
8657060	AF6	Spiked Blank	Total Total Kjeldahl Nitrogen	2017/06/09		111	%	80 - 120
8657060	AF6	Method Blank	Total Total Kjeldahl Nitrogen	2017/06/09	<0.050		mg/L	
8657060	AF6	RPD	Total Total Kjeldahl Nitrogen	2017/06/09	3.2		%	20
8657532	YY	Matrix Spike [RE9040-05]	Dissolved Organic Carbon (C)	2017/06/09		107	%	80 - 120
8657532	YY	Spiked Blank	Dissolved Organic Carbon (C)	2017/06/09		102	%	80 - 120
8657532	YY	Method Blank	Dissolved Organic Carbon (C)	2017/06/09	<0.50		mg/L	
8657532	YY	RPD [RE9040-05]	Dissolved Organic Carbon (C)	2017/06/09	3.8		%	20
8657534	YY	Matrix Spike [RE9055-05]	Dissolved Organic Carbon (C)	2017/06/09		NC	%	80 - 120
8657534	YY	Spiked Blank	Dissolved Organic Carbon (C)	2017/06/09		113	%	80 - 120
8657534	YY	Method Blank	Dissolved Organic Carbon (C)	2017/06/09	<0.50		mg/L	
8657534	YY	RPD [RE9055-05]	Dissolved Organic Carbon (C)	2017/06/09	8.8		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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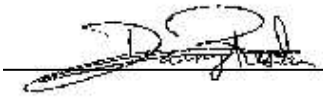
Maxxam Job #: B743380
Report Date: 2017/06/12

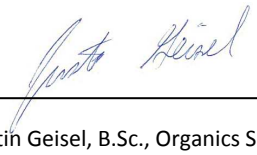
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01

VALIDATION SIGNATURE PAGE

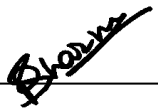
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



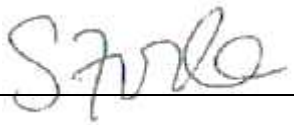
Daniel Reslan, cCT, QP, Organics Supervisor



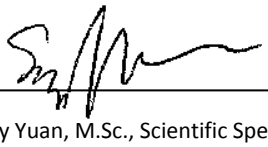
Justin Geisel, B.Sc., Organics Supervisor



Poonam Sharma, cCT, Organics Supervisor



Suwan Fock, B.Sc., QP, Inorganics Senior Analyst



Sandy Yuan, M.Sc., Scientific Specialist

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

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Your Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Your C.O.C. #: M056729, M056730, M056727

Attention:MICHELE CRAWFORD

TETRA TECH CANADA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Report Date: 2017/06/16
Report #: R2398703
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B744752
Received: 2017/06/06, 17:02

Sample Matrix: Water
Samples Received: 26

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	24	N/A	2017/06/12	AB SOP-00005	SM 22 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	22	N/A	2017/06/09	AB SOP-00039	CCME CWS/EPA 8260C m
BTEX/F1 in Water by HS GC/MS/FID	2	N/A	2017/06/10	AB SOP-00039	CCME CWS/EPA 8260C m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2017/06/11	AB SOP-00039	CCME CWS/EPA 8260C m
Cadmium - low level CCME - Dissolved	20	N/A	2017/06/12	AB WI-00065	Auto Calc
Cadmium - low level CCME - Dissolved	4	N/A	2017/06/13	AB WI-00065	Auto Calc
Cadmium - low level CCME - Dissolved	1	N/A	2017/06/14	AB WI-00065	Auto Calc
Chloride by Automated Colourimetry	24	N/A	2017/06/12	AB SOP-00020	SM 22 4500-Cl E m
Chemical Oxygen Demand	22	N/A	2017/06/09	AB SOP-00016	SM 22 5220D m
Carbon (DOC) -Lab Filtered (2)	3	N/A	2017/06/13	EENVSOP-00060	MMCW 119 1996 m
Carbon (DOC) (1, 3)	5	N/A	2017/06/12	CAL SOP-00077	MMCW 119 1996 m
Carbon (DOC) (1, 3)	15	N/A	2017/06/13	CAL SOP-00077	MMCW 119 1996 m
Conductivity @25C	24	N/A	2017/06/12	AB SOP-00005	SM 22 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (4)	22	2017/06/08	2017/06/09	AB SOP-00040 / AB SOP-00037	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (4)	1	2017/06/08	2017/06/10	AB SOP-00040 / AB SOP-00037	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (4)	2	2017/06/10	2017/06/10	AB SOP-00040 / AB SOP-00037	CCME PHC-CWS m
Hardness	24	N/A	2017/06/13	AB WI-00065	Auto Calc
Mercury - Low Level (Dissolved) (5)	1	2017/06/13	2017/06/13	EENVSOP-00031	EPA 1631E/245.1 R3 m
Mercury - Low Level (Dissolved) (5)	20	2017/06/14	2017/06/14	EENVSOP-00031	EPA 1631E/245.1 R3 m
Mercury-Low Level-Dissolved-Lab Filtered (6)	4	2017/06/08	2017/06/08	EENVSOP-00031	EPA 1631E/245.1 R3 m
Elements by ICP - Dissolved (5)	21	N/A	2017/06/13	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICP-Dissolved-Lab Filtered (7)	4	N/A	2017/06/12	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICPMS - Dissolved (5)	21	N/A	2017/06/09	AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS-Dissolved-Lab Filtered (7)	4	N/A	2017/06/12	AB SOP-00043	EPA 200.8 R5.4 m
Ion Balance	4	N/A	2017/06/08	AB WI-00065	Auto Calc
Ion Balance	18	N/A	2017/06/09	AB WI-00065	Auto Calc
Ion Balance	2	N/A	2017/06/10	AB WI-00065	Auto Calc
Sum of cations, anions	24	N/A	2017/06/13	AB WI-00065	Auto Calc

Your Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Your C.O.C. #: M056729, M056730, M056727

Attention:MICHELE CRAWFORD

TETRA TECH CANADA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Report Date: 2017/06/16
Report #: R2398703
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B744752
Received: 2017/06/06, 17:02

Sample Matrix: Water
Samples Received: 26

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Ammonia-N (Total) (1)	22	N/A	2017/06/13	AB SOP-00007	EPA 350.1 R2.0 m
Nitrate and Nitrite	4	N/A	2017/06/15	AB WI-00065	Auto Calc
Nitrate and Nitrite	20	N/A	2017/06/16	AB WI-00065	Auto Calc
Nitrate + Nitrite-N (calculated)	4	N/A	2017/06/15	AB WI-00065	Auto Calc
Nitrate + Nitrite-N (calculated)	20	N/A	2017/06/16	AB WI-00065	Auto Calc
Nitrogen (Nitrite - Nitrate) by IC	4	N/A	2017/06/14	AB SOP-00023	SM 22 4110 B m
Nitrogen (Nitrite - Nitrate) by IC	20	N/A	2017/06/15	AB SOP-00023	SM 22 4110 B m
Benzo[a]pyrene Equivalency (8)	1	N/A	2017/06/10	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	1	2017/06/08	2017/06/10	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270D m
pH @25°C (9)	24	N/A	2017/06/12	AB SOP-00005	SM 22 4500 H+ B m
Sulphate by Automated Colourimetry	24	N/A	2017/06/12	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Calculated)	24	N/A	2017/06/13	AB WI-00065	Auto Calc
Total Kjeldahl Nitrogen	21	2017/06/13	2017/06/14	AB SOP-00008	EPA 351.1 R 1978 m
Total Kjeldahl Nitrogen	1	2017/06/13	2017/06/15	AB SOP-00008	EPA 351.1 R 1978 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Your Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Your C.O.C. #: M056729, M056730, M056727

Attention:MICHELE CRAWFORD

TETRA TECH CANADA INC.
14940-123 AVENUE
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MAXXAM JOB #: B744752
Received: 2017/06/06, 17:02

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

(1) This test was performed by Maxxam Calgary Environmental
(2) DOC present in the sample should be considered as non-purgeable DOC.
(3) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: Whenever applicable, Dissolved >Total for any parameter that falls within method uncertainty for duplicates is likely equivalent. If RPD is >20% samples were reanalyzed and confirmed.
(4) Silica gel clean up employed.
(5) Dissolved > Total Imbalance: Whenever applicable, Dissolved >Total for any parameter that falls within method uncertainty for duplicates is likely equivalent. If RPD is >20% samples were reanalyzed and confirmed.
(6) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: Whenever applicable, Dissolved >Total for any parameter that falls within method uncertainty for duplicates is likely equivalent. If RPD is >20% samples were reanalyzed and confirmed.
(7) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: Whenever applicable, Dissolved >Total for any parameter that falls within method uncertainty for duplicates is likely equivalent. If RPD is >20% samples were reanalyzed and confirmed.
(8) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.
(9) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Maxxam endeavours to analyze samples as soon as possible after receipt.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ioana Stoica, Project Manager
Email: IStoica@maxxam.ca
Phone# (403)735-2227

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

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RF6344		RF6345	RF6346	RF6347		
Sampling Date		2017/06/06 14:50		2017/06/06 15:00	2017/06/06 14:20	2017/06/06 14:35		
COC Number		M056729		M056729	M056729	M056729		
	UNITS	MW-8A	QC Batch	MW-8B	MW-5A	MW-5B	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	8655934	<0.10	<0.10	<0.10	0.10	8656142
Volatiles								
Benzene	mg/L	<0.00040	8657618	<0.00040	<0.00040	<0.00040	0.00040	8657618
Toluene	mg/L	<0.00040	8657618	<0.00040	<0.00040	<0.00040	0.00040	8657618
Ethylbenzene	mg/L	<0.00040	8657618	<0.00040	<0.00040	<0.00040	0.00040	8657618
m & p-Xylene	mg/L	<0.00080	8657618	<0.00080	<0.00080	<0.00080	0.00080	8657618
o-Xylene	mg/L	<0.00040	8657618	<0.00040	<0.00040	<0.00040	0.00040	8657618
Xylenes (Total)	mg/L	<0.00080	8657618	<0.00080	<0.00080	<0.00080	0.00080	8657618
F1 (C6-C10) - BTEX	mg/L	<0.10	8657618	<0.10	<0.10	<0.10	0.10	8657618
F1 (C6-C10)	mg/L	<0.10	8657618	<0.10	<0.10	<0.10	0.10	8657618
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	98	8657618	99	97	99	N/A	8657618
4-Bromofluorobenzene (sur.)	%	100	8657618	100	101	100	N/A	8657618
D4-1,2-Dichloroethane (sur.)	%	102	8657618	102	107	104	N/A	8657618
O-TERPHENYL (sur.)	%	85	8655934	99	103	96	N/A	8656142

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RF6348	RF6349		RF6350	RF6351		
Sampling Date		2017/06/06 13:00	2017/06/06 12:55		2017/06/06 14:00	2017/06/06 14:10		
COC Number		M056729	M056729		M056729	M056729		
	UNITS	MW-12A	MW-12B	QC Batch	MW-24A	MW-24B	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	8655934	<0.10	<0.10	0.10	8656142
Volatiles								
Benzene	mg/L	<0.00040	<0.00040	8657618	<0.00040	<0.00040	0.00040	8657618
Toluene	mg/L	<0.00040	<0.00040	8657618	<0.00040	<0.00040	0.00040	8657618
Ethylbenzene	mg/L	<0.00040	<0.00040	8657618	<0.00040	<0.00040	0.00040	8657618
m & p-Xylene	mg/L	<0.00080	<0.00080	8657618	<0.00080	<0.00080	0.00080	8657618
o-Xylene	mg/L	<0.00040	<0.00040	8657618	<0.00040	<0.00040	0.00040	8657618
Xylenes (Total)	mg/L	<0.00080	<0.00080	8657618	<0.00080	<0.00080	0.00080	8657618
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	8657618	<0.10	<0.10	0.10	8657618
F1 (C6-C10)	mg/L	<0.10	<0.10	8657618	<0.10	<0.10	0.10	8657618
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	98	97	8657618	98	98	N/A	8657618
4-Bromofluorobenzene (sur.)	%	100	100	8657618	100	100	N/A	8657618
D4-1,2-Dichloroethane (sur.)	%	105	104	8657618	106	108	N/A	8657618
O-TERPHENYL (sur.)	%	85	85	8655934	89	100	N/A	8656142

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RF6352			RF6353		RF6389		
Sampling Date		2017/06/06 12:40			2017/06/06 09:10		2017/06/06 09:30		
COC Number		M056729			M056729		M056730		
	UNITS	MW-1B	RDL	QC Batch	MW-20A	QC Batch	MW-21A	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.27 (1)	0.27	8658925	<0.10	8655934	<0.10	0.10	8656142
Volatiles									
Benzene	mg/L	<0.00040	0.00040	8657618	<0.00040	8657618	<0.00040	0.00040	8657618
Toluene	mg/L	<0.00040	0.00040	8657618	<0.00040	8657618	<0.00040	0.00040	8657618
Ethylbenzene	mg/L	<0.00040	0.00040	8657618	<0.00040	8657618	<0.00040	0.00040	8657618
m & p-Xylene	mg/L	<0.00080	0.00080	8657618	<0.00080	8657618	<0.00080	0.00080	8657618
o-Xylene	mg/L	<0.00040	0.00040	8657618	<0.00040	8657618	<0.00040	0.00040	8657618
Xylenes (Total)	mg/L	<0.00080	0.00080	8657618	<0.00080	8657618	<0.00080	0.00080	8657618
F1 (C6-C10) - BTEX	mg/L	<0.10	0.10	8657618	<0.10	8657618	<0.10	0.10	8657618
F1 (C6-C10)	mg/L	<0.10	0.10	8657618	<0.10	8657618	<0.10	0.10	8657618
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	97	N/A	8657618	97	8657618	98	N/A	8657618
4-Bromofluorobenzene (sur.)	%	99	N/A	8657618	100	8657618	100	N/A	8657618
D4-1,2-Dichloroethane (sur.)	%	106	N/A	8657618	107	8657618	105	N/A	8657618
O-TERPHENYL (sur.)	%	94	N/A	8658925	85	8655934	91	N/A	8656142

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limit raised based on sample volume used for analysis.

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RF6390		RF6391	RF6392		RF6393		
Sampling Date		2017/06/06 10:00		2017/06/06 10:10	2017/06/06 10:30		2017/06/06 11:40		
COC Number		M056730		M056730	M056730		M056730		
	UNITS	MW-25A	QC Batch	MW-26A	MW-31A	QC Batch	MW-33A	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	8655118	<0.10	<0.10	8656142	<0.10	0.10	8656142
Volatiles									
Benzene	mg/L	<0.00040	8657618	<0.00040	<0.00040	8657618	<0.00040	0.00040	8657627
Toluene	mg/L	<0.00040	8657618	<0.00040	<0.00040	8657618	<0.00040	0.00040	8657627
Ethylbenzene	mg/L	<0.00040	8657618	<0.00040	<0.00040	8657618	<0.00040	0.00040	8657627
m & p-Xylene	mg/L	<0.00080	8657618	<0.00080	<0.00080	8657618	<0.00080	0.00080	8657627
o-Xylene	mg/L	<0.00040	8657618	<0.00040	<0.00040	8657618	<0.00040	0.00040	8657627
Xylenes (Total)	mg/L	<0.00080	8657618	<0.00080	<0.00080	8657618	<0.00080	0.00080	8657627
F1 (C6-C10) - BTEX	mg/L	<0.10	8657618	<0.10	<0.10	8657618	<0.10	0.10	8657627
F1 (C6-C10)	mg/L	<0.10	8657618	<0.10	<0.10	8657618	<0.10	0.10	8657627
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	97	8657618	101	100	8657618	101	N/A	8657627
4-Bromofluorobenzene (sur.)	%	100	8657618	99	99	8657618	100	N/A	8657627
D4-1,2-Dichloroethane (sur.)	%	109	8657618	105	104	8657618	98	N/A	8657627
O-TERPHENYL (sur.)	%	85	8655118	101	105	8656142	103	N/A	8656142

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RF6394	RF6395	RF6396	RF6397		
Sampling Date		2017/06/06 11:30	2017/06/06 13:30	2017/06/06 13:45	2017/06/06 08:30		
COC Number		M056730	M056730	M056730	M056730		
	UNITS	MW-33B	MW-34A	MW-34B	MW-35DEEP	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	8656142
Volatiles							
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8657627
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8657627
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8657627
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	8657627
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8657627
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	8657627
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	8657627
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	8657627
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	99	100	99	105	N/A	8657627
4-Bromofluorobenzene (sur.)	%	101	101	101	91	N/A	8657627
D4-1,2-Dichloroethane (sur.)	%	102	100	101	99	N/A	8657627
O-TERPHENYL (sur.)	%	97	96	98	97	N/A	8656142

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B744752
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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RF6398			RF6452	RF6453	RF6454		
Sampling Date		2017/06/06 08:45			2017/06/06 10:45	2017/06/06 11:00	2017/06/06		
COC Number		M056730			M056727	M056727	M056727		
	UNITS	MW-35A	RDL	QC Batch	MW-36DEEP	MW-36A	17TB	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.27 (1)	0.27	8658925	<0.10	<0.10	<0.10	0.10	8656142
Volatiles									
Benzene	mg/L	0.00049	0.00040	8657627	<0.00040	<0.00040	<0.00040	0.00040	8657627
Toluene	mg/L	<0.00040	0.00040	8657627	<0.00040	<0.00040	<0.00040	0.00040	8657627
Ethylbenzene	mg/L	<0.00040	0.00040	8657627	<0.00040	<0.00040	<0.00040	0.00040	8657627
m & p-Xylene	mg/L	<0.00080	0.00080	8657627	<0.00080	<0.00080	<0.00080	0.00080	8657627
o-Xylene	mg/L	<0.00040	0.00040	8657627	<0.00040	<0.00040	<0.00040	0.00040	8657627
Xylenes (Total)	mg/L	<0.00080	0.00080	8657627	<0.00080	<0.00080	<0.00080	0.00080	8657627
F1 (C6-C10) - BTEX	mg/L	<0.10	0.10	8657627	<0.10	<0.10	<0.10	0.10	8657627
F1 (C6-C10)	mg/L	<0.10	0.10	8657627	<0.10	<0.10	<0.10	0.10	8657627
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	N/A	8657627	99	101	102	N/A	8657627
4-Bromofluorobenzene (sur.)	%	100	N/A	8657627	101	99	100	N/A	8657627
D4-1,2-Dichloroethane (sur.)	%	100	N/A	8657627	102	99	100	N/A	8657627
O-TERPHENYL (sur.)	%	92	N/A	8658925	100	98	96	N/A	8656142

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limit raised based on sample volume used for analysis.

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Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RF6456		RF6457		
Sampling Date		2017/06/06		2017/06/06		
COC Number		M056727		M056727		
	UNITS	17DUPLICATE4	QC Batch	17DUPLICATE5	RDL	QC Batch
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	8656142	<0.10	0.10	8656142
Volatiles						
Benzene	mg/L	<0.00040	8657627	<0.00040	0.00040	8656026
Toluene	mg/L	<0.00040	8657627	<0.00040	0.00040	8656026
Ethylbenzene	mg/L	<0.00040	8657627	<0.00040	0.00040	8656026
m & p-Xylene	mg/L	<0.00080	8657627	<0.00080	0.00080	8656026
o-Xylene	mg/L	<0.00040	8657627	<0.00040	0.00040	8656026
Xylenes (Total)	mg/L	<0.00080	8657627	<0.00080	0.00080	8656026
F1 (C6-C10) - BTEX	mg/L	<0.10	8657627	<0.10	0.10	8656026
F1 (C6-C10)	mg/L	<0.10	8657627	<0.10	0.10	8656026
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	101	8657627	103	N/A	8656026
4-Bromofluorobenzene (sur.)	%	100	8657627	97	N/A	8656026
D4-1,2-Dichloroethane (sur.)	%	100	8657627	101	N/A	8656026
O-TERPHENYL (sur.)	%	95	8656142	99	N/A	8656142

RDL = Reportable Detection Limit
N/A = Not Applicable

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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6344			RF6345		RF6346		
Sampling Date		2017/06/06 14:50			2017/06/06 15:00		2017/06/06 14:20		
COC Number		M056729			M056729		M056729		
	UNITS	MW-8A	RDL	QC Batch	MW-8B	QC Batch	MW-5A	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	29	N/A	8655623	100	8655623	110	N/A	8655623
Cation Sum	meq/L	28	N/A	8655623	100	8655623	120	N/A	8655623
Hardness (CaCO3)	mg/L	26	0.50	8655590	480	8655590	1200	0.50	8655590
Ion Balance (% Difference)	%	2.2	N/A	8655621	0.098	8655621	3.2	N/A	8655621
Dissolved Nitrate (NO3)	mg/L	<0.044	0.044	8655514	1.5	8655514	1.7	0.22	8655514
Nitrate plus Nitrite (N)	mg/L	<0.010	0.010	8655515	0.35	8655515	0.71	0.050	8655515
Dissolved Nitrite (NO2)	mg/L	<0.033	0.033	8655514	<0.16	8655514	1.1	0.16	8655514
Calculated Total Dissolved Solids	mg/L	1700	10	8655626	6800	8655626	7900	10	8655626
Misc. Inorganics									
Conductivity	uS/cm	2500	1.0	8659874	8800	8659874	9600	1.0	8659874
pH	pH	8.49	N/A	8659872	8.17	8659872	7.99	N/A	8659872
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	0.020	8655615	<0.020	8655615	<0.020	0.020	8655615
Anions									
Alkalinity (PP as CaCO3)	mg/L	17	0.50	8659873	<0.50	8659873	<0.50	0.50	8659873
Alkalinity (Total as CaCO3)	mg/L	1100	0.50	8659873	940	8659873	590	0.50	8659873
Bicarbonate (HCO3)	mg/L	1300	0.50	8659873	1100	8659873	720	0.50	8659873
Carbonate (CO3)	mg/L	21	0.50	8659873	<0.50	8659873	<0.50	0.50	8659873
Hydroxide (OH)	mg/L	<0.50	0.50	8659873	<0.50	8659873	<0.50	0.50	8659873
Dissolved Sulphate (SO4)	mg/L	360 (1)	5.0	8659997	3900 (1)	8659997	4900 (1)	50	8659997
Dissolved Chloride (Cl)	mg/L	7.1	1.0	8659993	30	8659993	2.6	1.0	8659993
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	0.010	8659163	<0.050 (2)	8659163	0.33 (2)	0.050	8659163
Dissolved Nitrate (N)	mg/L	<0.010	0.010	8659163	0.35 (2)	8659163	0.38 (2)	0.050	8659163
Elements									
Dissolved Aluminum (Al)	mg/L	0.0088	0.0030	8658529	0.060	8658531	0.016	0.0030	8658531
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	8658529	<0.00060	8658531	<0.00060	0.00060	8658531
Dissolved Arsenic (As)	mg/L	0.0019	0.00020	8658529	0.0013	8658531	0.00047	0.00020	8658531
Dissolved Barium (Ba)	mg/L	0.049	0.010	8661680	<0.10	8661680	<0.10	0.10	8661951

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6344			RF6345		RF6346		
Sampling Date		2017/06/06 14:50			2017/06/06 15:00		2017/06/06 14:20		
COC Number		M056729			M056729		M056729		
	UNITS	MW-8A	RDL	QC Batch	MW-8B	QC Batch	MW-5A	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	8658529	<0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Boron (B)	mg/L	0.77	0.020	8661680	0.40	8661680	0.57	0.20	8661951
Dissolved Calcium (Ca)	mg/L	8.3	0.30	8661680	97	8661680	290	3.0	8661951
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	8658529	<0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Cobalt (Co)	mg/L	0.00032	0.00030	8658529	0.00095	8658531	0.00059	0.00030	8658531
Dissolved Copper (Cu)	mg/L	<0.00020	0.00020	8658529	0.00039	8658531	0.00080	0.00020	8658531
Dissolved Iron (Fe)	mg/L	<0.060	0.060	8661680	<0.60	8661680	<0.60	0.60	8661951
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	8658529	<0.00020	8658531	<0.00020	0.00020	8658531
Dissolved Lithium (Li)	mg/L	0.12	0.020	8661680	0.36	8661680	0.69	0.20	8661951
Dissolved Magnesium (Mg)	mg/L	1.3	0.20	8661680	57	8661680	100	2.0	8661951
Dissolved Manganese (Mn)	mg/L	0.025	0.0040	8661680	0.18	8661680	0.21	0.040	8661951
Dissolved Molybdenum (Mo)	mg/L	0.0062	0.00020	8658529	0.0013	8658531	0.00088	0.00020	8658531
Dissolved Nickel (Ni)	mg/L	0.0011	0.00050	8658529	0.0027	8658531	0.0045	0.00050	8658531
Dissolved Phosphorus (P)	mg/L	0.15	0.10	8661680	<1.0	8661680	<1.0	1.0	8661951
Dissolved Potassium (K)	mg/L	2.4	0.30	8661680	6.7	8661680	10	3.0	8661951
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	8658529	0.00025	8658531	<0.00020	0.00020	8658531
Dissolved Silicon (Si)	mg/L	3.8	0.10	8661680	4.3	8661680	5.0	1.0	8661951
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	8658529	<0.00010	8658531	<0.00010	0.00010	8658531
Dissolved Sodium (Na)	mg/L	630 (1)	5.0	8661680	2100	8661680	2200	5.0	8661951
Dissolved Strontium (Sr)	mg/L	0.19	0.020	8661680	2.4	8661680	5.3	0.20	8661951
Dissolved Sulphur (S)	mg/L	110	0.20	8661680	1400	8661680	1800	2.0	8661951
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	8658529	<0.00020	8658531	<0.00020	0.00020	8658531
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	8658529	<0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	8658529	<0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Uranium (U)	mg/L	0.00074	0.00010	8658529	0.0022	8658531	0.00046	0.00010	8658531
Dissolved Vanadium (V)	mg/L	0.0022	0.0010	8658529	<0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	8658529	<0.0030	8658531	<0.0030	0.0030	8658531

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

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6347		RF6348	RF6349	RF6350	RF6351		
Sampling Date		2017/06/06 14:35		2017/06/06 13:00	2017/06/06 12:55	2017/06/06 14:00	2017/06/06 14:10		
COC Number		M056729		M056729	M056729	M056729	M056729		
	UNITS	MW-5B	RDL	MW-12A	MW-12B	MW-24A	MW-24B	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	25	N/A	130	120	150	110	N/A	8655623
Cation Sum	meq/L	24	N/A	140	130	160	120	N/A	8655623
Hardness (CaCO3)	mg/L	34	0.50	770	950	1400	1700	0.50	8655590
Ion Balance (% Difference)	%	2.9	N/A	2.1	3.2	3.9	1.9	N/A	8655621
Dissolved Nitrate (NO3)	mg/L	1.7	0.044	0.87	<0.22	9.2	<0.22	0.22	8655514
Nitrate plus Nitrite (N)	mg/L	0.38	0.010	0.20	<0.050	2.1	<0.050	0.050	8655515
Dissolved Nitrite (NO2)	mg/L	<0.033	0.033	<0.16	<0.16	0.22	<0.16	0.16	8655514
Calculated Total Dissolved Solids	mg/L	1500	10	9200	8600	10000	7600	10	8655626
Misc. Inorganics									
Conductivity	uS/cm	2300	1.0	11000	11000	12000	9200	1.0	8659874
pH	pH	9.09	N/A	8.02	7.87	7.96	7.86	N/A	8659872
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	0.020	0.022	<0.020	0.090	0.029	0.020	8655615
Anions									
Alkalinity (PP as CaCO3)	mg/L	67	0.50	<0.50	<0.50	<0.50	<0.50	0.50	8659873
Alkalinity (Total as CaCO3)	mg/L	780	0.50	780	710	800	790	0.50	8659873
Bicarbonate (HCO3)	mg/L	790	0.50	950	860	970	970	0.50	8659873
Carbonate (CO3)	mg/L	80	0.50	<0.50	<0.50	<0.50	<0.50	0.50	8659873
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	<0.50	<0.50	<0.50	0.50	8659873
Dissolved Sulphate (SO4)	mg/L	440 (1)	5.0	5600 (1)	5300 (1)	6400 (1)	4600 (1)	50	8659997
Dissolved Chloride (Cl)	mg/L	17	1.0	1.3	4.6	16	54	1.0	8659993
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	0.010	<0.050 (2)	<0.050 (2)	0.067 (2)	<0.050 (2)	0.050	8659163
Dissolved Nitrate (N)	mg/L	0.38	0.010	0.20 (2)	<0.050 (2)	2.1 (2)	<0.050 (2)	0.050	8659163
Elements									
Dissolved Aluminum (Al)	mg/L	0.031	0.0030	<0.0030	0.0037	0.0034	0.0039	0.0030	8658531
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00060	8658531
Dissolved Arsenic (As)	mg/L	0.0020	0.00020	0.00078	0.00067	0.0014	0.00071	0.00020	8658531
Dissolved Barium (Ba)	mg/L	0.035	0.010	<0.10	<0.10	<0.10	<0.10	0.10	8661951

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6347		RF6348	RF6349	RF6350	RF6351		
Sampling Date		2017/06/06 14:35		2017/06/06 13:00	2017/06/06 12:55	2017/06/06 14:00	2017/06/06 14:10		
COC Number		M056729		M056729	M056729	M056729	M056729		
	UNITS	MW-5B	RDL	MW-12A	MW-12B	MW-24A	MW-24B	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8658531
Dissolved Boron (B)	mg/L	0.44	0.020	0.46	0.55	0.62	0.24	0.20	8661951
Dissolved Calcium (Ca)	mg/L	8.2	0.30	160	280	260	360	3.0	8661951
Dissolved Chromium (Cr)	mg/L	0.0012	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8658531
Dissolved Cobalt (Co)	mg/L	<0.00030	0.00030	0.00072	0.00034	0.00084	<0.00030	0.00030	8658531
Dissolved Copper (Cu)	mg/L	0.0034	0.00020	0.00074	0.0015	0.0040	0.0022	0.00020	8658531
Dissolved Iron (Fe)	mg/L	<0.060	0.060	<0.60	<0.60	<0.60	<0.60	0.60	8661951
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8658531
Dissolved Lithium (Li)	mg/L	0.099	0.020	0.63	0.56	0.79	0.92	0.20	8661951
Dissolved Magnesium (Mg)	mg/L	3.4	0.20	90	63	180	200	2.0	8661951
Dissolved Manganese (Mn)	mg/L	<0.0040	0.0040	<0.040	0.42	0.38	<0.040	0.040	8661951
Dissolved Molybdenum (Mo)	mg/L	0.011	0.00020	0.00076	0.00052	0.0057	0.0012	0.00020	8658531
Dissolved Nickel (Ni)	mg/L	0.0073	0.00050	0.0070	0.0012	0.016	0.068	0.00050	8658531
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	<1.0	<1.0	<1.0	<1.0	1.0	8661951
Dissolved Potassium (K)	mg/L	13	0.30	10	9.3	11	10	3.0	8661951
Dissolved Selenium (Se)	mg/L	0.00029	0.00020	<0.00020	<0.00020	0.0027	0.00028	0.00020	8658531
Dissolved Silicon (Si)	mg/L	2.1	0.10	4.4	4.7	3.6	9.5	1.0	8661951
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8658531
Dissolved Sodium (Na)	mg/L	520 (1)	5.0	2800	2600	3100	1900	5.0	8661951
Dissolved Strontium (Sr)	mg/L	0.18	0.020	3.7	5.5	6.3	5.4	0.20	8661951
Dissolved Sulphur (S)	mg/L	140	0.20	2000	1900	2400	1600	2.0	8661951
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8658531
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8658531
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8658531
Dissolved Uranium (U)	mg/L	0.0032	0.00010	0.0023	0.025	0.25	0.17	0.00010	8658531
Dissolved Vanadium (V)	mg/L	0.014	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	8658531
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	0.0042	<0.0030	<0.0030	<0.0030	0.0030	8658531

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

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6352	RF6353		RF6389		RF6390		
Sampling Date		2017/06/06 12:40	2017/06/06 09:10		2017/06/06 09:30		2017/06/06 10:00		
COC Number		M056729	M056729		M056730		M056730		
	UNITS	MW-1B	MW-20A	RDL	MW-21A	QC Batch	MW-25A	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	31	35	N/A	23	8655623	24	N/A	8655623
Cation Sum	meq/L	30	35	N/A	21	8655623	22	N/A	8655623
Hardness (CaCO3)	mg/L	35	54	0.50	12	8655590	13	0.50	8655590
Ion Balance (% Difference)	%	1.9	0.38	N/A	4.4	8655621	4.6	N/A	8655621
Dissolved Nitrate (NO3)	mg/L	13	21	0.044	4.1	8655514	2.0	0.044	8655514
Nitrate plus Nitrite (N)	mg/L	2.8	4.9	0.010	0.96	8655515	0.53	0.010	8655515
Dissolved Nitrite (NO2)	mg/L	<0.033	0.28	0.033	0.064	8655514	0.27	0.033	8655514
Calculated Total Dissolved Solids	mg/L	1800	2100	10	1200	8655626	1200	10	8655626
Misc. Inorganics									
Conductivity	uS/cm	2900	3200	1.0	2000	8659874	2000	1.0	8659874
pH	pH	8.54	8.34	N/A	8.41	8659872	8.55	N/A	8659872
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	0.022	<0.020	0.020	0.099	8655615	<0.020	0.020	8655615
Anions									
Alkalinity (PP as CaCO3)	mg/L	17	4.6	0.50	9.4	8659873	23	0.50	8659873
Alkalinity (Total as CaCO3)	mg/L	890	1000	0.50	1100	8659873	1200	0.50	8659873
Bicarbonate (HCO3)	mg/L	1000	1200	0.50	1300	8659873	1400	0.50	8659873
Carbonate (CO3)	mg/L	21	5.5	0.50	11	8659873	28	0.50	8659873
Hydroxide (OH)	mg/L	<0.50	<0.50	0.50	<0.50	8659873	<0.50	0.50	8659873
Dissolved Sulphate (SO4)	mg/L	610 (1)	660 (1)	5.0	65	8659997	3.1	1.0	8660035
Dissolved Chloride (Cl)	mg/L	6.2	7.9	1.0	11	8659993	8.9	1.0	8660028
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	0.085	0.010	0.020	8659163	0.082	0.010	8659163
Dissolved Nitrate (N)	mg/L	2.8	4.8	0.010	0.94	8659163	0.45	0.010	8659163
Elements									
Dissolved Aluminum (Al)	mg/L	0.059	0.0078	0.0030	0.0043	8658531	0.0043	0.0030	8658531
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	0.00060	<0.00060	8658531	0.00064	0.00060	8658531
Dissolved Arsenic (As)	mg/L	0.00098	0.00040	0.00020	0.0011	8658531	0.0023	0.00020	8658531
Dissolved Barium (Ba)	mg/L	0.024	0.027	0.010	0.096	8661951	0.10	0.010	8661951
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	0.0010	<0.0010	8658531	<0.0010	0.0010	8658531

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6352	RF6353		RF6389		RF6390		
Sampling Date		2017/06/06 12:40	2017/06/06 09:10		2017/06/06 09:30		2017/06/06 10:00		
COC Number		M056729	M056729		M056730		M056730		
	UNITS	MW-1B	MW-20A	RDL	MW-21A	QC Batch	MW-25A	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.64	0.79	0.020	0.82	8661951	0.83	0.020	8661951
Dissolved Calcium (Ca)	mg/L	12	18	0.30	4.3	8661951	4.5	0.30	8661951
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	0.0010	<0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Cobalt (Co)	mg/L	0.00099	<0.00030	0.00030	<0.00030	8658531	0.00032	0.00030	8658531
Dissolved Copper (Cu)	mg/L	0.0018	0.00031	0.00020	0.0016	8658531	<0.00020	0.00020	8658531
Dissolved Iron (Fe)	mg/L	<0.060	<0.060	0.060	<0.060	8661951	<0.060	0.060	8661951
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	0.00020	<0.00020	8658531	<0.00020	0.00020	8658531
Dissolved Lithium (Li)	mg/L	0.14	0.21	0.020	0.11	8661951	0.099	0.020	8661951
Dissolved Magnesium (Mg)	mg/L	1.6	2.4	0.20	0.40	8661951	0.42	0.20	8661951
Dissolved Manganese (Mn)	mg/L	0.095	0.031	0.0040	0.0047	8661951	0.070	0.0040	8661951
Dissolved Molybdenum (Mo)	mg/L	0.0075	0.0015	0.00020	0.0058	8658531	0.0060	0.00020	8658531
Dissolved Nickel (Ni)	mg/L	0.0056	0.0014	0.00050	0.0028	8658531	0.0022	0.00050	8658531
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10	0.10	<0.10	8661951	<0.10	0.10	8661951
Dissolved Potassium (K)	mg/L	2.2	2.9	0.30	1.5	8661951	1.7	0.30	8661951
Dissolved Selenium (Se)	mg/L	0.00035	<0.00020	0.00020	0.00020	8658531	<0.00020	0.00020	8658531
Dissolved Silicon (Si)	mg/L	2.7	2.9	0.10	2.7	8661951	2.9	0.10	8661951
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	0.00010	<0.00010	8658531	<0.00010	0.00010	8658531
Dissolved Sodium (Na)	mg/L	670 (1)	780 (1)	5.0	480	8661951	490	0.50	8661951
Dissolved Strontium (Sr)	mg/L	0.26	0.38	0.020	0.11	8661951	0.11	0.020	8661951
Dissolved Sulphur (S)	mg/L	190	220	0.20	19	8661951	1.3	0.20	8661951
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	0.00020	<0.00020	8658531	<0.00020	0.00020	8658531
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	0.0010	<0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010	0.0010	<0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Uranium (U)	mg/L	0.0020	0.0015	0.00010	0.0036	8658531	0.0012	0.00010	8658531
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	0.0010	<0.0010	8658531	0.0015	0.0010	8658531
Dissolved Zinc (Zn)	mg/L	<0.0030	<0.0030	0.0030	<0.0030	8658531	<0.0030	0.0030	8658531

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

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6393			RF6394		RF6395		
Sampling Date		2017/06/06 11:40			2017/06/06 11:30		2017/06/06 13:30		
COC Number		M056730			M056730		M056730		
	UNITS	MW-33A	RDL	QC Batch	MW-33B	RDL	MW-34A	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	20	N/A	8655623	64	N/A	28	N/A	8655623
Cation Sum	meq/L	17	N/A	8655623	63	N/A	27	N/A	8655623
Hardness (CaCO3)	mg/L	15	0.50	8655590	490	0.50	40	0.50	8655590
Ion Balance (% Difference)	%	7.7	N/A	8655621	0.82	N/A	2.4	N/A	8655621
Dissolved Nitrate (NO3)	mg/L	<0.044	0.044	8655514	0.68	0.22	<0.044	0.044	8655514
Nitrate plus Nitrite (N)	mg/L	<0.010	0.010	8655515	0.21	0.050	<0.010	0.010	8655515
Dissolved Nitrite (NO2)	mg/L	<0.033	0.033	8655514	0.20	0.16	<0.033	0.033	8655514
Calculated Total Dissolved Solids	mg/L	1100	10	8655626	4100	10	1600	10	8655626
Misc. Inorganics									
Conductivity	uS/cm	1800	1.0	8659874	5600	1.0	2500	1.0	8659896
pH	pH	8.52	N/A	8659872	7.99	N/A	8.43	N/A	8659894
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	0.020	8655615	0.044	0.020	<0.020	0.020	8655615
Anions									
Alkalinity (PP as CaCO3)	mg/L	15	0.50	8659873	<0.50	0.50	12	0.50	8659895
Alkalinity (Total as CaCO3)	mg/L	840	0.50	8659873	1000	0.50	1000	0.50	8659895
Bicarbonate (HCO3)	mg/L	990	0.50	8659873	1200	0.50	1200	0.50	8659895
Carbonate (CO3)	mg/L	18	0.50	8659873	<0.50	0.50	15	0.50	8659895
Hydroxide (OH)	mg/L	<0.50	0.50	8659873	<0.50	0.50	<0.50	0.50	8659895
Dissolved Sulphate (SO4)	mg/L	130	1.0	8659997	2100 (1)	20	310 (1)	5.0	8659997
Dissolved Chloride (Cl)	mg/L	24	1.0	8659993	21	1.0	25	1.0	8659993
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	0.010	8659163	0.061 (2)	0.050	<0.010	0.010	8659163
Dissolved Nitrate (N)	mg/L	<0.010	0.010	8659163	0.15 (2)	0.050	<0.010	0.010	8659163
Elements									
Dissolved Aluminum (Al)	mg/L	0.0050	0.0030	8658531	0.0049	0.0030	0.0049	0.0030	8658531
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	8658531	<0.00060	0.00060	<0.00060	0.00060	8658531
Dissolved Arsenic (As)	mg/L	0.0018	0.00020	8658531	0.0014	0.00020	0.0028	0.00020	8658531
Dissolved Barium (Ba)	mg/L	0.053	0.010	8661951	<0.10	0.10	0.039	0.010	8661951

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6393			RF6394		RF6395		
Sampling Date		2017/06/06 11:40			2017/06/06 11:30		2017/06/06 13:30		
COC Number		M056730			M056730		M056730		
	UNITS	MW-33A	RDL	QC Batch	MW-33B	RDL	MW-34A	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	8658531	<0.0010	0.0010	<0.0010	0.0010	8658531
Dissolved Boron (B)	mg/L	0.68	0.020	8661951	0.25	0.20	0.84	0.020	8661951
Dissolved Calcium (Ca)	mg/L	4.7	0.30	8661951	130	3.0	12	0.30	8661951
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	8658531	<0.0010	0.0010	<0.0010	0.0010	8658531
Dissolved Cobalt (Co)	mg/L	0.00057	0.00030	8658531	0.0024	0.00030	0.00054	0.00030	8658531
Dissolved Copper (Cu)	mg/L	<0.00020	0.00020	8658531	0.0028	0.00020	<0.00020	0.00020	8658531
Dissolved Iron (Fe)	mg/L	<0.060	0.060	8661951	<0.60	0.60	0.31	0.060	8661951
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	8658531	<0.00020	0.00020	<0.00020	0.00020	8658531
Dissolved Lithium (Li)	mg/L	0.070	0.020	8661951	0.37	0.20	0.13	0.020	8661951
Dissolved Magnesium (Mg)	mg/L	0.70	0.20	8661951	42	2.0	2.2	0.20	8661951
Dissolved Manganese (Mn)	mg/L	0.027	0.0040	8661951	0.25	0.040	0.13	0.0040	8661951
Dissolved Molybdenum (Mo)	mg/L	0.016	0.00020	8658531	0.00080	0.00020	0.012	0.00020	8658531
Dissolved Nickel (Ni)	mg/L	0.0022	0.00050	8658531	0.011	0.00050	0.0039	0.00050	8658531
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	8661951	<1.0	1.0	<0.10	0.10	8661951
Dissolved Potassium (K)	mg/L	1.4	0.30	8661951	6.1	3.0	2.6	0.30	8661951
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	8658531	0.00043	0.00020	<0.00020	0.00020	8658531
Dissolved Silicon (Si)	mg/L	3.3	0.10	8661951	4.6	1.0	4.1	0.10	8661951
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	8658531	<0.00010	0.00010	<0.00010	0.00010	8658531
Dissolved Sodium (Na)	mg/L	390	0.50	8661951	1200	5.0	600 (1)	5.0	8661951
Dissolved Strontium (Sr)	mg/L	0.093	0.020	8661951	2.3	0.20	0.24	0.020	8661951
Dissolved Sulphur (S)	mg/L	35	0.20	8661951	690	2.0	100	0.20	8661951
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	8658531	<0.00020	0.00020	<0.00020	0.00020	8658531
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	8658531	<0.0010	0.0010	<0.0010	0.0010	8658531
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	8658531	<0.0010	0.0010	<0.0010	0.0010	8658531
Dissolved Uranium (U)	mg/L	0.0012	0.00010	8658531	0.00026	0.00010	0.0050	0.00010	8658531
Dissolved Vanadium (V)	mg/L	0.0014	0.0010	8658531	<0.0010	0.0010	0.0011	0.0010	8658531
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	8658531	<0.0030	0.0030	<0.0030	0.0030	8658531

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

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6396			RF6398			RF6453		
Sampling Date		2017/06/06 13:45			2017/06/06 08:45			2017/06/06 11:00		
COC Number		M056730			M056730			M056727		
	UNITS	MW-34B	RDL	QC Batch	MW-35A	RDL	QC Batch	MW-36A	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	29	N/A	8655623	18	N/A	8655623	18	N/A	8655623
Cation Sum	meq/L	28	N/A	8655623	17	N/A	8655623	17	N/A	8655623
Hardness (CaCO3)	mg/L	690	0.50	8655620	10	0.50	8655620	9.5	0.50	8655620
Ion Balance (% Difference)	%	1.6	N/A	8655621	2.4	N/A	8655621	2.7	N/A	8655621
Dissolved Nitrate (NO3)	mg/L	<0.22	0.22	8655514	<0.044	0.044	8655624	<0.044	0.044	8655624
Nitrate plus Nitrite (N)	mg/L	<0.050	0.050	8655515	<0.010	0.010	8655625	<0.010	0.010	8655625
Dissolved Nitrite (NO2)	mg/L	<0.16	0.16	8655514	<0.033	0.033	8655624	<0.033	0.033	8655624
Calculated Total Dissolved Solids	mg/L	1600	10	8655626	950	10	8655626	930	10	8655626
Misc. Inorganics										
Conductivity	uS/cm	2400	1.0	8659896	1600	1.0	8659896	1600	1.0	8659896
pH	pH	7.51	N/A	8659894	8.61	N/A	8659894	8.52	N/A	8659894
Low Level Elements										
Dissolved Cadmium (Cd)	ug/L	0.056	0.020	8655615	<0.020	0.020	8655615	<0.020	0.020	8655615
Anions										
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8659895	19	0.50	8659895	15	0.50	8659895
Alkalinity (Total as CaCO3)	mg/L	890	0.50	8659895	830	0.50	8659895	880	0.50	8659895
Bicarbonate (HCO3)	mg/L	1100	0.50	8659895	960	0.50	8659895	1000	0.50	8659895
Carbonate (CO3)	mg/L	<0.50	0.50	8659895	23	0.50	8659895	18	0.50	8659895
Hydroxide (OH)	mg/L	<0.50	0.50	8659895	<0.50	0.50	8659895	<0.50	0.50	8659895
Dissolved Sulphate (SO4)	mg/L	470 (1)	5.0	8659997	21	1.0	8659997	2.9	1.0	8660035
Dissolved Chloride (Cl)	mg/L	39	1.0	8659993	36 (2)	2.0	8659993	7.1	1.0	8660028
Nutrients										
Dissolved Nitrite (N)	mg/L	<0.050 (2)	0.050	8659163	<0.010	0.010	8659163	<0.010	0.010	8659220
Dissolved Nitrate (N)	mg/L	<0.050 (2)	0.050	8659163	<0.010	0.010	8659163	<0.010	0.010	8659220
Elements										
Dissolved Aluminum (Al)	mg/L	<0.0030	0.0030	8658531	0.055	0.0030	8658531	0.0093	0.0030	8658531
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	8658531	<0.00060	0.00060	8658531	<0.00060	0.00060	8658531
Dissolved Arsenic (As)	mg/L	0.00034	0.00020	8658531	0.0023	0.00020	8658531	0.00075	0.00020	8658531
Dissolved Barium (Ba)	mg/L	0.052	0.010	8661951	0.13	0.010	8661951	0.034	0.010	8661951

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6396			RF6398			RF6453		
Sampling Date		2017/06/06 13:45			2017/06/06 08:45			2017/06/06 11:00		
COC Number		M056730			M056730			M056727		
	UNITS	MW-34B	RDL	QC Batch	MW-35A	RDL	QC Batch	MW-36A	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	8658531	<0.0010	0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Boron (B)	mg/L	0.060	0.020	8661951	0.74	0.020	8661951	0.79	0.020	8661951
Dissolved Calcium (Ca)	mg/L	180	0.30	8661951	3.6	0.30	8661951	3.3	0.30	8661951
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	8658531	<0.0010	0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Cobalt (Co)	mg/L	<0.00030	0.00030	8658531	0.00035	0.00030	8658531	0.00043	0.00030	8658531
Dissolved Copper (Cu)	mg/L	0.0020	0.00020	8658531	0.00065	0.00020	8658531	<0.00020	0.00020	8658531
Dissolved Iron (Fe)	mg/L	<0.060	0.060	8661951	<0.060	0.060	8661951	<0.060	0.060	8661951
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	8658531	<0.00020	0.00020	8658531	<0.00020	0.00020	8658531
Dissolved Lithium (Li)	mg/L	0.12	0.020	8661951	0.069	0.020	8661951	0.067	0.020	8661951
Dissolved Magnesium (Mg)	mg/L	60	0.20	8661951	0.34	0.20	8661951	0.32	0.20	8661951
Dissolved Manganese (Mn)	mg/L	0.053	0.0040	8661951	0.013	0.0040	8661951	0.032	0.0040	8661951
Dissolved Molybdenum (Mo)	mg/L	0.00054	0.00020	8658531	0.016	0.00020	8658531	0.0088	0.00020	8658531
Dissolved Nickel (Ni)	mg/L	0.0057	0.00050	8658531	0.0034	0.00050	8658531	0.00085	0.00050	8658531
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	8661951	1.2	0.10	8661951	0.11	0.10	8661951
Dissolved Potassium (K)	mg/L	9.7	0.30	8661951	3.1	0.30	8661951	1.3	0.30	8661951
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	8658531	<0.00020	0.00020	8658531	<0.00020	0.00020	8658531
Dissolved Silicon (Si)	mg/L	6.5	0.10	8661951	3.5	0.10	8661951	3.5	0.10	8661951
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	8658531	<0.00010	0.00010	8658531	<0.00010	0.00010	8658531
Dissolved Sodium (Na)	mg/L	320	0.50	8661951	390	0.50	8661951	380	0.50	8661951
Dissolved Strontium (Sr)	mg/L	1.2	0.020	8661951	0.086	0.020	8661951	0.046	0.020	8661951
Dissolved Sulphur (S)	mg/L	150	0.20	8661951	5.9	0.20	8661951	0.72	0.20	8661951
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	8658531	<0.00020	0.00020	8658531	<0.00020	0.00020	8658531
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	8658531	<0.0010	0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	8658531	<0.0010	0.0010	8658531	<0.0010	0.0010	8658531
Dissolved Uranium (U)	mg/L	0.0034	0.00010	8658531	0.00095	0.00010	8658531	0.00026	0.00010	8658531
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	8658531	0.0012	0.0010	8658531	0.0021	0.0010	8658531
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	8658531	<0.0030	0.0030	8658531	<0.0030	0.0030	8658531
RDL = Reportable Detection Limit										

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6456		RF6457		
Sampling Date		2017/06/06		2017/06/06		
COC Number		M056727		M056727		
	UNITS	17DUPLICATE4	RDL	17DUPLICATE5	RDL	QC Batch
Calculated Parameters						
Anion Sum	meq/L	64	N/A	28	N/A	8655623
Cation Sum	meq/L	65	N/A	27	N/A	8655623
Hardness (CaCO3)	mg/L	500	0.50	40	0.50	8655620
Ion Balance (% Difference)	%	0.67	N/A	1.7	N/A	8655622
Dissolved Nitrate (NO3)	mg/L	1.1	0.044	<0.044	0.044	8655624
Nitrate plus Nitrite (N)	mg/L	0.33	0.010	<0.010	0.010	8655625
Dissolved Nitrite (NO2)	mg/L	0.32	0.033	<0.033	0.033	8655624
Calculated Total Dissolved Solids	mg/L	4100	10	1600	10	8655627
Misc. Inorganics						
Conductivity	uS/cm	5600	1.0	2500	1.0	8659896
pH	pH	8.03	N/A	8.45	N/A	8659894
Low Level Elements						
Dissolved Cadmium (Cd)	ug/L	0.045	0.020	<0.020	0.020	8655616
Anions						
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	13	0.50	8659895
Alkalinity (Total as CaCO3)	mg/L	1000	0.50	1100	0.50	8659895
Bicarbonate (HCO3)	mg/L	1200	0.50	1300	0.50	8659895
Carbonate (CO3)	mg/L	<0.50	0.50	15	0.50	8659895
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	0.50	8659895
Dissolved Sulphate (SO4)	mg/L	2100 (1)	20	320 (1)	5.0	8660035
Dissolved Chloride (Cl)	mg/L	21	1.0	26	1.0	8660028
Nutrients						
Dissolved Nitrite (N)	mg/L	0.097	0.010	<0.010	0.010	8659220
Dissolved Nitrate (N)	mg/L	0.24	0.010	<0.010	0.010	8659220
Elements						
Dissolved Aluminum (Al)	mg/L	<0.0030	0.0030	0.0041	0.0030	8658531
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	<0.00060	0.00060	8658531
Dissolved Arsenic (As)	mg/L	0.0015	0.00020	0.0022	0.00020	8658531
Dissolved Barium (Ba)	mg/L	<0.10	0.10	0.033	0.010	8661951
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8658531

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF6456		RF6457		
Sampling Date		2017/06/06		2017/06/06		
COC Number		M056727		M056727		
	UNITS	17DUPLICATE4	RDL	17DUPLICATE5	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.25	0.20	0.84	0.020	8661951
Dissolved Calcium (Ca)	mg/L	130	3.0	12	0.30	8661951
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8658531
Dissolved Cobalt (Co)	mg/L	0.0024	0.00030	0.00054	0.00030	8658531
Dissolved Copper (Cu)	mg/L	0.0024	0.00020	<0.00020	0.00020	8658531
Dissolved Iron (Fe)	mg/L	<0.60	0.60	0.24	0.060	8661951
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	<0.00020	0.00020	8658531
Dissolved Lithium (Li)	mg/L	0.36	0.20	0.13	0.020	8661951
Dissolved Magnesium (Mg)	mg/L	43	2.0	2.2	0.20	8661951
Dissolved Manganese (Mn)	mg/L	0.25	0.040	0.12	0.0040	8661951
Dissolved Molybdenum (Mo)	mg/L	0.00064	0.00020	0.011	0.00020	8658531
Dissolved Nickel (Ni)	mg/L	0.011	0.00050	0.0041	0.00050	8658531
Dissolved Phosphorus (P)	mg/L	<1.0	1.0	<0.10	0.10	8661951
Dissolved Potassium (K)	mg/L	5.7	3.0	2.7	0.30	8661951
Dissolved Selenium (Se)	mg/L	0.00043	0.00020	<0.00020	0.00020	8658531
Dissolved Silicon (Si)	mg/L	4.8	1.0	4.0	0.10	8661951
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	<0.00010	0.00010	8658531
Dissolved Sodium (Na)	mg/L	1300	5.0	610 (1)	5.0	8661951
Dissolved Strontium (Sr)	mg/L	2.4	0.20	0.24	0.020	8661951
Dissolved Sulphur (S)	mg/L	710	2.0	100	0.20	8661951
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	<0.00020	0.00020	8658531
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8658531
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8658531
Dissolved Uranium (U)	mg/L	0.00023	0.00010	0.0047	0.00010	8658531
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	0.0010	0.0010	8658531
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	<0.0030	0.0030	8658531

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

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Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Maxxam ID		RF6391		RF6392			RF6397		
Sampling Date		2017/06/06 10:10		2017/06/06 10:30			2017/06/06 08:30		
COC Number		M056730		M056730			M056730		
	UNITS	MW-26A	RDL	MW-31A	RDL	QC Batch	MW-35DEEP	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	29	N/A	20	N/A	8655623	48	N/A	8655623
Cation Sum	meq/L	30	N/A	21	N/A	8655623	50	N/A	8655623
Hardness (CaCO3)	mg/L	26	0.50	15	0.50	8655590	58	0.50	8655620
Ion Balance (% Difference)	%	1.0	N/A	3.2	N/A	8655621	2.3	N/A	8655621
Dissolved Nitrate (NO3)	mg/L	5.7	0.044	14	0.044	8655514	<0.22	0.22	8655514
Nitrate plus Nitrite (N)	mg/L	1.3	0.010	3.2	0.010	8655515	<0.050	0.050	8655515
Dissolved Nitrite (NO2)	mg/L	<0.033	0.033	0.077	0.033	8655514	<0.16	0.16	8655514
Calculated Total Dissolved Solids	mg/L	1700	10	1100	10	8655626	2800	10	8655626
Misc. Inorganics									
Conductivity	uS/cm	2600	1.0	1700	1.0	8659874	5300	1.0	8659896
pH	pH	8.56	N/A	8.57	N/A	8659872	8.13	N/A	8659894
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	0.020	0.025	0.020	8655615	<0.020	0.020	8655615
Anions									
Alkalinity (PP as CaCO3)	mg/L	20	0.50	19	0.50	8659873	<0.50	0.50	8659895
Alkalinity (Total as CaCO3)	mg/L	900	0.50	880	0.50	8659873	410	0.50	8659895
Bicarbonate (HCO3)	mg/L	1100	0.50	1000	0.50	8659873	500	0.50	8659895
Carbonate (CO3)	mg/L	23	0.50	23	0.50	8659873	<0.50	0.50	8659895
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	0.50	8659873	<0.50	0.50	8659895
Dissolved Sulphate (SO4)	mg/L	510 (1)	5.0	76	1.0	8659997	13	1.0	8659997
Dissolved Chloride (Cl)	mg/L	5.4	1.0	5.2	1.0	8659993	1400 (1)	10	8659993
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	0.010	0.023	0.010	8659163	<0.050 (2)	0.050	8659163
Dissolved Nitrate (N)	mg/L	1.3	0.010	3.2	0.010	8659163	<0.050 (2)	0.050	8659163
Lab Filtered Elements									
Dissolved Aluminum (Al)	mg/L	0.0099	0.0030	0.55	0.0030	8660658	0.0031	0.0030	8660658
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	0.00077	0.00060	8660658	<0.00060	0.00060	8660658
Dissolved Arsenic (As)	mg/L	0.0023	0.00020	0.0042	0.00020	8660658	0.00081	0.00020	8660658
Dissolved Barium (Ba)	mg/L	0.054	0.010	0.085	0.010	8661067	0.41	0.010	8661067

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Maxxam ID		RF6391		RF6392			RF6397		
Sampling Date		2017/06/06 10:10		2017/06/06 10:30			2017/06/06 08:30		
COC Number		M056730		M056730			M056730		
	UNITS	MW-26A	RDL	MW-31A	RDL	QC Batch	MW-35DEEP	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8660658	<0.0010	0.0010	8660658
Dissolved Boron (B)	mg/L	0.81	0.020	0.74	0.020	8661067	0.75	0.020	8661067
Dissolved Calcium (Ca)	mg/L	8.5	0.30	4.9	0.30	8661067	20	0.30	8661067
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8660658	<0.0010	0.0010	8660658
Dissolved Cobalt (Co)	mg/L	<0.00030	0.00030	0.0016	0.00030	8660658	0.00052	0.00030	8660658
Dissolved Copper (Cu)	mg/L	0.0040	0.00020	0.0046	0.00020	8660658	0.00048	0.00020	8660658
Dissolved Iron (Fe)	mg/L	<0.060	0.060	0.18	0.060	8661067	<0.060	0.060	8661067
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	0.00043	0.00020	8660658	<0.00020	0.00020	8660658
Dissolved Lithium (Li)	mg/L	0.15	0.020	0.086	0.020	8661067	0.19	0.020	8661067
Dissolved Magnesium (Mg)	mg/L	1.2	0.20	0.52	0.20	8661067	2.1	0.20	8661067
Dissolved Manganese (Mn)	mg/L	<0.0040	0.0040	0.036	0.0040	8661067	0.053	0.0040	8661067
Dissolved Molybdenum (Mo)	mg/L	0.0026	0.00020	0.019	0.00020	8660658	0.017	0.00020	8660658
Dissolved Nickel (Ni)	mg/L	0.0019	0.00050	0.012	0.00050	8660658	0.0013	0.00050	8660658
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	<0.10	0.10	8661067	<0.10	0.10	8661067
Dissolved Potassium (K)	mg/L	2.4	0.30	1.9	0.30	8661067	3.8	0.30	8661067
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	0.00078	0.00020	8660658	<0.00020	0.00020	8660658
Dissolved Silicon (Si)	mg/L	4.1	0.10	3.1	0.10	8661067	3.6	0.10	8661067
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	<0.00010	0.00010	8660658	<0.00010	0.00010	8660658
Dissolved Sodium (Na)	mg/L	670 (1)	5.0	470	0.50	8661067	1100 (1)	5.0	8661067
Dissolved Strontium (Sr)	mg/L	0.22	0.020	0.11	0.020	8661067	0.50	0.020	8661067
Dissolved Sulphur (S)	mg/L	150	0.20	24	0.20	8661067	4.6	0.20	8661067
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	<0.00020	0.00020	8660658	<0.00020	0.00020	8660658
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8660658	0.0013	0.0010	8660658
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	0.0094	0.0010	8660658	<0.0010	0.0010	8660658
Dissolved Uranium (U)	mg/L	0.00063	0.00010	0.0041	0.00010	8660658	0.00064	0.00010	8660658
Dissolved Vanadium (V)	mg/L	0.0052	0.0010	0.0013	0.0010	8660658	<0.0010	0.0010	8660658
Dissolved Zinc (Zn)	mg/L	0.0032	0.0030	<0.0030	0.0030	8660658	0.16	0.0030	8660658

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

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Maxxam ID		RF6452		
Sampling Date		2017/06/06 10:45		
COC Number		M056727		
	UNITS	MW-36DEEP	RDL	QC Batch
Calculated Parameters				
Anion Sum	meq/L	46	N/A	8655623
Cation Sum	meq/L	48	N/A	8655623
Hardness (CaCO3)	mg/L	53	0.50	8655620
Ion Balance (% Difference)	%	2.3	N/A	8655621
Dissolved Nitrate (NO3)	mg/L	<0.044	0.044	8655624
Nitrate plus Nitrite (N)	mg/L	<0.010	0.010	8655625
Dissolved Nitrite (NO2)	mg/L	<0.033	0.033	8655624
Calculated Total Dissolved Solids	mg/L	2600	10	8655626
Misc. Inorganics				
Conductivity	uS/cm	4800	1.0	8659896
pH	pH	8.33	N/A	8659894
Low Level Elements				
Dissolved Cadmium (Cd)	ug/L	<0.020	0.020	8655615
Anions				
Alkalinity (PP as CaCO3)	mg/L	2.6	0.50	8659895
Alkalinity (Total as CaCO3)	mg/L	770	0.50	8659895
Bicarbonate (HCO3)	mg/L	940	0.50	8659895
Carbonate (CO3)	mg/L	3.1	0.50	8659895
Hydroxide (OH)	mg/L	<0.50	0.50	8659895
Dissolved Sulphate (SO4)	mg/L	11	1.0	8659997
Dissolved Chloride (Cl)	mg/L	1100 (1)	10	8659993
Nutrients				
Dissolved Nitrite (N)	mg/L	<0.010	0.010	8659220
Dissolved Nitrate (N)	mg/L	<0.010	0.010	8659220
Lab Filtered Elements				
Dissolved Aluminum (Al)	mg/L	0.0069	0.0030	8660658
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	8660658
Dissolved Arsenic (As)	mg/L	0.0024	0.00020	8660658
Dissolved Barium (Ba)	mg/L	0.32	0.010	8661067

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

ROUTINE + DISS. REG. METALS – LAB FILT (WATER)

Maxxam ID		RF6452		
Sampling Date		2017/06/06 10:45		
COC Number		M056727		
	UNITS	MW-36DEEP	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	8660658
Dissolved Boron (B)	mg/L	0.97	0.020	8661067
Dissolved Calcium (Ca)	mg/L	18	0.30	8661067
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	8660658
Dissolved Cobalt (Co)	mg/L	0.0012	0.00030	8660658
Dissolved Copper (Cu)	mg/L	0.00060	0.00020	8660658
Dissolved Iron (Fe)	mg/L	<0.060	0.060	8661067
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	8660658
Dissolved Lithium (Li)	mg/L	0.19	0.020	8661067
Dissolved Magnesium (Mg)	mg/L	2.1	0.20	8661067
Dissolved Manganese (Mn)	mg/L	0.071	0.0040	8661067
Dissolved Molybdenum (Mo)	mg/L	0.011	0.00020	8660658
Dissolved Nickel (Ni)	mg/L	0.0046	0.00050	8660658
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	8661067
Dissolved Potassium (K)	mg/L	3.9	0.30	8661067
Dissolved Selenium (Se)	mg/L	0.00030	0.00020	8660658
Dissolved Silicon (Si)	mg/L	3.6	0.10	8661067
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	8660658
Dissolved Sodium (Na)	mg/L	1100 (1)	5.0	8661067
Dissolved Strontium (Sr)	mg/L	0.46	0.020	8661067
Dissolved Sulphur (S)	mg/L	3.3	0.20	8661067
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	8660658
Dissolved Tin (Sn)	mg/L	0.0030	0.0010	8660658
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	8660658
Dissolved Uranium (U)	mg/L	0.0016	0.00010	8660658
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	8660658
Dissolved Zinc (Zn)	mg/L	0.10	0.0030	8660658

RDL = Reportable Detection Limit

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

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

REGULATED METALS (CCME/AT1) - DISSOLVED

Maxxam ID		RF6455		
Sampling Date		2017/06/06 12:00		
COC Number		M056727		
	UNITS	17FB01	RDL	QC Batch
Low Level Elements				
Dissolved Cadmium (Cd)	ug/L	<0.020	0.020	8655616
Elements				
Dissolved Aluminum (Al)	mg/L	0.0036	0.0030	8658531
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	8658531
Dissolved Arsenic (As)	mg/L	<0.00020	0.00020	8658531
Dissolved Barium (Ba)	mg/L	<0.010	0.010	8661951
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	8658531
Dissolved Boron (B)	mg/L	<0.020	0.020	8661951
Dissolved Calcium (Ca)	mg/L	<0.30	0.30	8661951
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	8658531
Dissolved Cobalt (Co)	mg/L	<0.00030	0.00030	8658531
Dissolved Copper (Cu)	mg/L	<0.00020	0.00020	8658531
Dissolved Iron (Fe)	mg/L	<0.060	0.060	8661951
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	8658531
Dissolved Lithium (Li)	mg/L	<0.020	0.020	8661951
Dissolved Magnesium (Mg)	mg/L	<0.20	0.20	8661951
Dissolved Manganese (Mn)	mg/L	<0.0040	0.0040	8661951
Dissolved Molybdenum (Mo)	mg/L	<0.00020	0.00020	8658531
Dissolved Nickel (Ni)	mg/L	<0.00050	0.00050	8658531
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	8661951
Dissolved Potassium (K)	mg/L	<0.30	0.30	8661951
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	8658531
Dissolved Silicon (Si)	mg/L	<0.10	0.10	8661951
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	8658531
Dissolved Sodium (Na)	mg/L	<0.50	0.50	8661951
Dissolved Strontium (Sr)	mg/L	<0.020	0.020	8661951
Dissolved Sulphur (S)	mg/L	<0.20	0.20	8661951
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	8658531
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	8658531
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	8658531
Dissolved Uranium (U)	mg/L	<0.00010	0.00010	8658531
RDL = Reportable Detection Limit				

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Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

REGULATED METALS (CCME/AT1) - DISSOLVED

Maxxam ID		RF6455		
Sampling Date		2017/06/06 12:00		
COC Number		M056727		
	UNITS	**17FB01**	**RDL**	**QC Batch**
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	8658531
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	8658531
RDL = Reportable Detection Limit				

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Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		RF6344		RF6345		RF6346		RF6347		
Sampling Date		2017/06/06 14:50		2017/06/06 15:00		2017/06/06 14:20		2017/06/06 14:35		
COC Number		M056729		M056729		M056729		M056729		
	UNITS	MW-8A	QC Batch	MW-8B	QC Batch	MW-5A	QC Batch	MW-5B	RDL	QC Batch
Demand Parameters										
Total Chemical Oxygen Demand	mg/L	40	8657505	44	8657505	59	8657505	48	5.0	8657901
Misc. Inorganics										
Dissolved Organic Carbon (C)	mg/L	12	8660227	16	8660227	24	8660227	7.7	0.50	8660227
Nutrients										
Total Ammonia (N)	mg/L	0.63	8661729	0.38	8661719	0.22	8661706	0.32	0.015	8661719
Total Total Kjeldahl Nitrogen	mg/L	1.3	8661325	1.3	8661325	1.2	8661325	0.93	0.050	8661325
RDL = Reportable Detection Limit										

Maxxam ID		RF6348			RF6349			RF6350		
Sampling Date		2017/06/06 13:00			2017/06/06 12:55			2017/06/06 14:00		
COC Number		M056729			M056729			M056729		
	UNITS	MW-12A	RDL	QC Batch	MW-12B	RDL	QC Batch	MW-24A	RDL	QC Batch
Demand Parameters										
Total Chemical Oxygen Demand	mg/L	40	5.0	8657901	52	5.0	8657901	84	5.0	8657901
Misc. Inorganics										
Dissolved Organic Carbon (C)	mg/L	16	0.50	8660227	21	0.50	8661671	38 (1)	1.0	8661671
Nutrients										
Total Ammonia (N)	mg/L	0.067	0.015	8661710	1.7	0.015	8661719	1.3	0.015	8661710
Total Total Kjeldahl Nitrogen	mg/L	0.70	0.050	8661325	2.8 (1)	0.25	8661325	2.7 (1)	0.25	8661325
RDL = Reportable Detection Limit										
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.										

Maxxam Job #: B744752
Report Date: 2017/06/16

TETRA TECH CANADA INC.
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RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		RF6351	RF6352		RF6353		RF6389	RF6390		
Sampling Date		2017/06/06 14:10	2017/06/06 12:40		2017/06/06 09:10		2017/06/06 09:30	2017/06/06 10:00		
COC Number		M056729	M056729		M056729		M056730	M056730		
	UNITS	MW-24B	MW-1B	QC Batch	MW-20A	QC Batch	MW-21A	MW-25A	RDL	QC Batch
Demand Parameters										
Total Chemical Oxygen Demand	mg/L	44	N/A	8657901	35	8657901	43	25	5.0	8657901
Misc. Inorganics										
Dissolved Organic Carbon (C)	mg/L	16	11	8661671	6.4	8661671	9.2	9.6	0.50	8661671
Nutrients										
Total Ammonia (N)	mg/L	0.035	N/A	8661710	0.30	8661706	0.071	0.55	0.015	8661710
Total Total Kjeldahl Nitrogen	mg/L	0.85	N/A	8661325	1.0	8661325	0.96	1.2	0.050	8661325

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam ID		RF6391			RF6392		RF6393		
Sampling Date		2017/06/06 10:10			2017/06/06 10:30		2017/06/06 11:40		
COC Number		M056730			M056730		M056730		
	UNITS	MW-26A	RDL	QC Batch	MW-31A	RDL	MW-33A	RDL	QC Batch
Demand Parameters									
Total Chemical Oxygen Demand	mg/L	26	5.0	8657901	300	5.0	130	5.0	8657901
Misc. Inorganics									
Dissolved Organic Carbon (C)	mg/L	N/A	0.50	8661671	N/A	0.50	25	0.50	8661671
Lab Filtered Inorganics									
Dissolved Organic Carbon (C)	mg/L	N/A	1.0	8662315	19 (1)	1.0	N/A	1.0	8662315
Nutrients									
Total Ammonia (N)	mg/L	<0.015	0.015	8661719	1.2	0.015	0.79	0.015	8661710
Total Total Kjeldahl Nitrogen	mg/L	0.77	0.050	8661325	7.4 (2)	2.5	2.4 (3)	0.25	8661325

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.
(2) Detection limits raised due to sample matrix.
(3) Detection limits raised due to dilution to bring analyte within the calibrated range.

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TETRA TECH CANADA INC.
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RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		RF6394			RF6395		RF6396		
Sampling Date		2017/06/06 11:30			2017/06/06 13:30		2017/06/06 13:45		
COC Number		M056730			M056730		M056730		
	UNITS	MW-33B	RDL	QC Batch	MW-34A	RDL	MW-34B	RDL	QC Batch
Demand Parameters									
Total Chemical Oxygen Demand	mg/L	150	5.0	8657901	190	5.0	35	5.0	8657901
Misc. Inorganics									
Dissolved Organic Carbon (C)	mg/L	49 (1)	2.5	8661671	60 (1)	2.5	13	0.50	8661671
Nutrients									
Total Ammonia (N)	mg/L	0.60	0.015	8661719	0.94	0.015	0.069	0.015	8661729
Total Total Kjeldahl Nitrogen	mg/L	2.7 (1)	0.25	8661325	1.8	0.050	0.85	0.050	8661325

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

Maxxam ID		RF6397		RF6452			RF6453	RF6455		
Sampling Date		2017/06/06 08:30		2017/06/06 10:45			2017/06/06 11:00	2017/06/06 12:00		
COC Number		M056730		M056727			M056727	M056727		
	UNITS	MW-35DEEP	RDL	MW-36DEEP	RDL	QC Batch	MW-36A	17FB01	RDL	QC Batch
Demand Parameters										
Total Chemical Oxygen Demand	mg/L	130	5.0	140	5.0	8657901	42	N/A	5.0	8657901
Misc. Inorganics										
Dissolved Organic Carbon (C)	mg/L	N/A	0.50	N/A	0.50	8661671	14	<0.50	0.50	8661671
Lab Filtered Inorganics										
Dissolved Organic Carbon (C)	mg/L	17	0.50	39 (1)	1.0	8662315	N/A	N/A	1.0	8662315
Nutrients										
Total Ammonia (N)	mg/L	1.2	0.015	1.3	0.015	8661706	0.52	N/A	0.015	8661729
Total Total Kjeldahl Nitrogen	mg/L	2.5 (1)	0.25	2.6 (1)	0.25	8661983	1.2	N/A	0.050	8661983

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		RF6456		RF6457		
Sampling Date		2017/06/06		2017/06/06		
COC Number		M056727		M056727		
	UNITS	17DUPLICATE4	RDL	17DUPLICATE5	RDL	QC Batch
Demand Parameters						
Total Chemical Oxygen Demand	mg/L	140	5.0	190	5.0	8657901
Misc. Inorganics						
Dissolved Organic Carbon (C)	mg/L	51 (1)	2.5	60 (1)	2.5	8661671
Nutrients						
Total Ammonia (N)	mg/L	0.58	0.015	0.95	0.015	8661719
Total Total Kjeldahl Nitrogen	mg/L	2.7 (1)	0.25	1.8	0.050	8661983

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

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SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		RF6390		
Sampling Date		2017/06/06 10:00		
COC Number		M056730		
	UNITS	MW-25A	RDL	QC Batch
Polycyclic Aromatics				
Benzo[a]pyrene equivalency	ug/L	<0.010	0.010	8654618
Acenaphthene	ug/L	<0.10	0.10	8654186
Acenaphthylene	ug/L	<0.10	0.10	8654186
Acridine	ug/L	<0.050	0.050	8654186
Anthracene	ug/L	<0.010	0.010	8654186
Benzo(a)anthracene	ug/L	<0.0085	0.0085	8654186
Benzo(b&j)fluoranthene	ug/L	<0.0085	0.0085	8654186
Benzo(k)fluoranthene	ug/L	<0.0085	0.0085	8654186
Benzo(g,h,i)perylene	ug/L	<0.0085	0.0085	8654186
Benzo(c)phenanthrene	ug/L	<0.050	0.050	8654186
Benzo(a)pyrene	ug/L	<0.0075	0.0075	8654186
Benzo[e]pyrene	ug/L	<0.050	0.050	8654186
Chrysene	ug/L	<0.0085	0.0085	8654186
Dibenz(a,h)anthracene	ug/L	<0.0075	0.0075	8654186
Fluoranthene	ug/L	<0.010	0.010	8654186
Fluorene	ug/L	<0.050	0.050	8654186
Indeno(1,2,3-cd)pyrene	ug/L	<0.0085	0.0085	8654186
2-Methylnaphthalene	ug/L	<0.10	0.10	8654186
Naphthalene	ug/L	<0.10	0.10	8654186
Phenanthrene	ug/L	<0.050	0.050	8654186
Perylene	ug/L	<0.050	0.050	8654186
Pyrene	ug/L	<0.020	0.020	8654186
Quinoline	ug/L	<0.20	0.20	8654186
Surrogate Recovery (%)				
D10-ANTHRACENE (sur.)	%	94	N/A	8654186
D8-ACENAPHTHYLENE (sur.)	%	82	N/A	8654186
D8-NAPHTHALENE (sur.)	%	64	N/A	8654186
TERPHENYL-D14 (sur.)	%	122	N/A	8654186

RDL = Reportable Detection Limit
N/A = Not Applicable

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Sampler Initials: BS

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		RF6344		RF6345	RF6346	RF6347	RF6348	RF6349		
Sampling Date		2017/06/06 14:50		2017/06/06 15:00	2017/06/06 14:20	2017/06/06 14:35	2017/06/06 13:00	2017/06/06 12:55		
COC Number		M056729		M056729	M056729	M056729	M056729	M056729		
	UNITS	MW-8A	QC Batch	MW-8B	MW-5A	MW-5B	MW-12A	MW-12B	RDL	QC Batch
Low Level Elements										
Dissolved Mercury (Hg)	ug/L	<0.0020	8661481	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8662721
RDL = Reportable Detection Limit										

Maxxam ID		RF6350	RF6351	RF6352	RF6353	RF6389	RF6390		
Sampling Date		2017/06/06 14:00	2017/06/06 14:10	2017/06/06 12:40	2017/06/06 09:10	2017/06/06 09:30	2017/06/06 10:00		
COC Number		M056729	M056729	M056729	M056729	M056730	M056730		
	UNITS	MW-24A	MW-24B	MW-1B	MW-20A	MW-21A	MW-25A	RDL	QC Batch
Low Level Elements									
Dissolved Mercury (Hg)	ug/L	<0.0020	<0.0020	<0.0020	<0.0020	N/A	<0.0020	0.0020	8662721
Lab Filtered Elements-Low									
Dissolved Mercury (Hg)	ug/L	N/A	N/A	N/A	N/A	<0.0020	N/A	0.0020	8655914
RDL = Reportable Detection Limit N/A = Not Applicable									

Maxxam ID		RF6392	RF6393	RF6394	RF6395	RF6396	RF6397		
Sampling Date		2017/06/06 10:30	2017/06/06 11:40	2017/06/06 11:30	2017/06/06 13:30	2017/06/06 13:45	2017/06/06 08:30		
COC Number		M056730	M056730	M056730	M056730	M056730	M056730		
	UNITS	MW-31A	MW-33A	MW-33B	MW-34A	MW-34B	MW-35DEEP	RDL	QC Batch
Low Level Elements									
Dissolved Mercury (Hg)	ug/L	N/A	<0.0020	0.0076	<0.0020	<0.0020	N/A	0.0020	8662721
Lab Filtered Elements-Low									
Dissolved Mercury (Hg)	ug/L	<0.0020	N/A	N/A	N/A	N/A	<0.0020	0.0020	8655914
RDL = Reportable Detection Limit N/A = Not Applicable									

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		RF6398	RF6452	RF6453	RF6454	RF6455	RF6456		
Sampling Date		2017/06/06 08:45	2017/06/06 10:45	2017/06/06 11:00	2017/06/06	2017/06/06 12:00	2017/06/06		
COC Number		M056730	M056727	M056727	M056727	M056727	M056727		
	UNITS	MW-35A	MW-36DEEP	MW-36A	17TB	17FB01	17DUPLICATE4	RDL	QC Batch
Low Level Elements									
Dissolved Mercury (Hg)	ug/L	<0.0020	N/A	<0.0020	<0.0020	<0.0020	0.0076	0.0020	8662721
Lab Filtered Elements-Low									
Dissolved Mercury (Hg)	ug/L	N/A	<0.0020	N/A	N/A	N/A	N/A	0.0020	8655914

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam ID		RF6457		
Sampling Date		2017/06/06		
COC Number		M056727		
	UNITS	17DUPLICATE5	RDL	QC Batch
Low Level Elements				
Dissolved Mercury (Hg)	ug/L	<0.0020	0.0020	8662721

RDL = Reportable Detection Limit

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GENERAL COMMENTS

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

Package 1	10.0°C
Package 2	6.3°C
Package 3	7.7°C
Package 4	7.7°C

Sample RF6344 [MW-8A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6345 [MW-8B] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6346 [MW-5A] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6347 [MW-5B] : Client supplied DM bottle contained particulate. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6348 [MW-12A] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6349 [MW-12B] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6350 [MW-24A] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6351 [MW-24B] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6352 [MW-1B] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6353 [MW-20A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6389 [MW-21A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6390 [MW-25A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6391 [MW-26A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

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Sample RF6392 [MW-31A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6393 [MW-33A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6394 [MW-33B] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6395 [MW-34A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6396 [MW-34B] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6397 [MW-35DEEP] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6398 [MW-35A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6452 [MW-36DEEP] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6453 [MW-36A] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6456 [17DUPLICATE4] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF6457 [17DUPLICATE5] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold tim

Results relate only to the items tested.

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Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8654186	RC6	Matrix Spike	D10-ANTHRACENE (sur.)	2017/06/09		96	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2017/06/09		90	%	50 - 130
			D8-NAPHTHALENE (sur.)	2017/06/09		71	%	50 - 130
			TERPHENYL-D14 (sur.)	2017/06/09		103	%	50 - 130
			Acenaphthene	2017/06/09		91	%	50 - 130
			Acenaphthylene	2017/06/09		95	%	50 - 130
			Acridine	2017/06/09		95	%	50 - 130
			Anthracene	2017/06/09		97	%	50 - 130
			Benzo(a)anthracene	2017/06/09		111	%	50 - 130
			Benzo(b&j)fluoranthene	2017/06/09		93	%	50 - 130
			Benzo(k)fluoranthene	2017/06/09		110	%	50 - 130
			Benzo(g,h,i)perylene	2017/06/09		77	%	50 - 130
			Benzo(c)phenanthrene	2017/06/09		139 (1)	%	50 - 130
			Benzo(a)pyrene	2017/06/09		84	%	50 - 130
			Benzo[e]pyrene	2017/06/09		101	%	50 - 130
			Chrysene	2017/06/09		118	%	50 - 130
			Dibenz(a,h)anthracene	2017/06/09		69	%	50 - 130
			Fluoranthene	2017/06/09		125	%	50 - 130
			Fluorene	2017/06/09		97	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/06/09		92	%	50 - 130
			2-Methylnaphthalene	2017/06/09		81	%	50 - 130
			Naphthalene	2017/06/09		78	%	50 - 130
			Phenanthrene	2017/06/09		99	%	50 - 130
			Perylene	2017/06/09		97	%	50 - 130
			Pyrene	2017/06/09		116	%	50 - 130
			Quinoline	2017/06/09		111	%	50 - 130
8654186	RC6	Spiked Blank	D10-ANTHRACENE (sur.)	2017/06/10		84	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2017/06/10		72	%	50 - 130
			D8-NAPHTHALENE (sur.)	2017/06/10		73	%	50 - 130
			TERPHENYL-D14 (sur.)	2017/06/10		117	%	50 - 130
			Acenaphthene	2017/06/10		82	%	50 - 130
			Acenaphthylene	2017/06/10		81	%	50 - 130
			Acridine	2017/06/10		80	%	50 - 130
			Anthracene	2017/06/10		88	%	50 - 130
			Benzo(a)anthracene	2017/06/10		118	%	50 - 130
			Benzo(b&j)fluoranthene	2017/06/10		106	%	50 - 130
			Benzo(k)fluoranthene	2017/06/10		128	%	50 - 130
			Benzo(g,h,i)perylene	2017/06/10		91	%	50 - 130
			Benzo(c)phenanthrene	2017/06/10		142 (1)	%	50 - 130
			Benzo(a)pyrene	2017/06/10		91	%	50 - 130
			Benzo[e]pyrene	2017/06/10		116	%	50 - 130
			Chrysene	2017/06/10		130	%	50 - 130
			Dibenz(a,h)anthracene	2017/06/10		78	%	50 - 130
			Fluoranthene	2017/06/10		126	%	50 - 130
			Fluorene	2017/06/10		80	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2017/06/10		64	%	50 - 130
			2-Methylnaphthalene	2017/06/10		77	%	50 - 130
			Naphthalene	2017/06/10		78	%	50 - 130
			Phenanthrene	2017/06/10		93	%	50 - 130
			Perylene	2017/06/10		116	%	50 - 130
			Pyrene	2017/06/10		117	%	50 - 130
			Quinoline	2017/06/10		114	%	50 - 130

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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8654186	RC6	Method Blank	D10-ANTHRACENE (sur.)	2017/06/09		96	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2017/06/09		91	%	50 - 130
			D8-NAPHTHALENE (sur.)	2017/06/09		75	%	50 - 130
			TERPHENYL-D14 (sur.)	2017/06/09		131 (1)		50 - 130
			Acenaphthene	2017/06/09	<0.10		ug/L	
			Acenaphthylene	2017/06/09	<0.10		ug/L	
			Acridine	2017/06/09	<0.050		ug/L	
			Anthracene	2017/06/09	<0.010		ug/L	
			Benzo(a)anthracene	2017/06/09	<0.0085		ug/L	
			Benzo(b&j)fluoranthene	2017/06/09	<0.0085		ug/L	
			Benzo(k)fluoranthene	2017/06/09	<0.0085		ug/L	
			Benzo(g,h,i)perylene	2017/06/09	<0.0085		ug/L	
			Benzo(c)phenanthrene	2017/06/09	<0.050		ug/L	
			Benzo(a)pyrene	2017/06/09	<0.0075		ug/L	
			Benzo[e]pyrene	2017/06/09	<0.050		ug/L	
			Chrysene	2017/06/09	<0.0085		ug/L	
			Dibenz(a,h)anthracene	2017/06/09	<0.0075		ug/L	
			Fluoranthene	2017/06/09	<0.010		ug/L	
			Fluorene	2017/06/09	<0.050		ug/L	
			Indeno(1,2,3-cd)pyrene	2017/06/09	<0.0085		ug/L	
			2-Methylnaphthalene	2017/06/09	<0.10		ug/L	
			Naphthalene	2017/06/09	<0.10		ug/L	
			Phenanthrene	2017/06/09	<0.050		ug/L	
			Perylene	2017/06/09	<0.050		ug/L	
			Pyrene	2017/06/09	<0.020		ug/L	
			Quinoline	2017/06/09	<0.20		ug/L	
8654186	RC6	RPD	Acenaphthene	2017/06/10	NC		%	30
			Acenaphthylene	2017/06/10	NC		%	30
			Anthracene	2017/06/10	NC		%	30
			Benzo(a)anthracene	2017/06/10	NC		%	30
			Benzo(b&j)fluoranthene	2017/06/10	NC		%	30
			Benzo(k)fluoranthene	2017/06/10	NC		%	30
			Benzo(g,h,i)perylene	2017/06/10	NC		%	30
			Benzo(a)pyrene	2017/06/10	NC		%	30
			Chrysene	2017/06/10	NC		%	30
			Dibenz(a,h)anthracene	2017/06/10	NC		%	30
			Fluoranthene	2017/06/10	NC		%	30
			Fluorene	2017/06/10	NC		%	30
			Indeno(1,2,3-cd)pyrene	2017/06/10	NC		%	30
			Naphthalene	2017/06/10	NC		%	30
			Phenanthrene	2017/06/10	NC		%	30
			Pyrene	2017/06/10	NC		%	30
8655118	KK5	Matrix Spike	O-TERPHENYL (sur.)	2017/06/09		100	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09		120	%	60 - 130
8655118	KK5	Spiked Blank	O-TERPHENYL (sur.)	2017/06/09		104	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09		124	%	70 - 130
8655118	KK5	Method Blank	O-TERPHENYL (sur.)	2017/06/09		100	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09	<0.10		mg/L	
8655118	KK5	RPD	F2 (C10-C16 Hydrocarbons)	2017/06/09	NC		%	30
8655914	NP4	Matrix Spike	Dissolved Mercury (Hg)	2017/06/08		95	%	85 - 115
8655914	NP4	QC Standard	Dissolved Mercury (Hg)	2017/06/08		106	%	85 - 115
8655914	NP4	Spiked Blank	Dissolved Mercury (Hg)	2017/06/08		109	%	85 - 115

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8655914	NP4	Method Blank	Dissolved Mercury (Hg)	2017/06/08	<0.0020		ug/L	
8655914	NP4	RPD	Dissolved Mercury (Hg)	2017/06/08	NC		%	20
8655934	KK5	Matrix Spike	O-TERPHENYL (sur.)	2017/06/09		84	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09		103	%	60 - 130
8655934	KK5	Spiked Blank	O-TERPHENYL (sur.)	2017/06/09		83	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09		103	%	70 - 130
8655934	KK5	Method Blank	O-TERPHENYL (sur.)	2017/06/09		79	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09	<0.10		mg/L	
8655934	KK5	RPD	F2 (C10-C16 Hydrocarbons)	2017/06/09	NC		%	30
8656026	YZ3	Matrix Spike	1,4-Difluorobenzene (sur.)	2017/06/09		102	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/09		94	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/09		103	%	70 - 130
			Benzene	2017/06/09		96	%	70 - 130
			Toluene	2017/06/09		95	%	70 - 130
			Ethylbenzene	2017/06/09		97	%	70 - 130
			m & p-Xylene	2017/06/09		99	%	70 - 130
			o-Xylene	2017/06/09		101	%	70 - 130
			F1 (C6-C10)	2017/06/09		80	%	70 - 130
8656026	YZ3	Spiked Blank	1,4-Difluorobenzene (sur.)	2017/06/09		99	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/09		96	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/09		102	%	70 - 130
			Benzene	2017/06/09		94	%	70 - 130
			Toluene	2017/06/09		92	%	70 - 130
			Ethylbenzene	2017/06/09		93	%	70 - 130
			m & p-Xylene	2017/06/09		94	%	70 - 130
			o-Xylene	2017/06/09		99	%	70 - 130
			F1 (C6-C10)	2017/06/09		108	%	70 - 130
8656026	YZ3	Method Blank	1,4-Difluorobenzene (sur.)	2017/06/09		102	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/09		96	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/09		103	%	70 - 130
			Benzene	2017/06/09	<0.00040		mg/L	
			Toluene	2017/06/09	<0.00040		mg/L	
			Ethylbenzene	2017/06/09	<0.00040		mg/L	
			m & p-Xylene	2017/06/09	<0.00080		mg/L	
			o-Xylene	2017/06/09	<0.00040		mg/L	
			Xylenes (Total)	2017/06/09	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2017/06/09	<0.10		mg/L	
			F1 (C6-C10)	2017/06/09	<0.10		mg/L	
8656026	YZ3	RPD	Benzene	2017/06/09	NC		%	30
			Toluene	2017/06/09	NC		%	30
			Ethylbenzene	2017/06/09	NC		%	30
			m & p-Xylene	2017/06/09	NC		%	30
			o-Xylene	2017/06/09	NC		%	30
			Xylenes (Total)	2017/06/09	NC		%	30
			F1 (C6-C10) - BTEX	2017/06/09	NC		%	30
			F1 (C6-C10)	2017/06/09	NC		%	30
8656142	KK5	Matrix Spike [RF6396-06]	O-TERPHENYL (sur.)	2017/06/09		104	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09		128	%	60 - 130
8656142	KK5	Spiked Blank	O-TERPHENYL (sur.)	2017/06/09		88	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09		109	%	70 - 130
8656142	KK5	Method Blank	O-TERPHENYL (sur.)	2017/06/09		90	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09	<0.10		mg/L	

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8656142	KK5	RPD [RF6393-06]	F2 (C10-C16 Hydrocarbons)	2017/06/09	NC		%	30
8657505	MRD	Matrix Spike [RF6346-03]	Total Chemical Oxygen Demand	2017/06/09		101	%	80 - 120
8657505	MRD	Spiked Blank	Total Chemical Oxygen Demand	2017/06/09		101	%	80 - 120
8657505	MRD	Method Blank	Total Chemical Oxygen Demand	2017/06/09	<5.0		mg/L	
8657505	MRD	RPD [RF6346-03]	Total Chemical Oxygen Demand	2017/06/09	3.4		%	20
8657618	HG3	Matrix Spike	1,4-Difluorobenzene (sur.)	2017/06/09		100	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/09		108	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/09		106	%	70 - 130
			Benzene	2017/06/09		92	%	70 - 130
			Toluene	2017/06/09		87	%	70 - 130
			Ethylbenzene	2017/06/09		95	%	70 - 130
			m & p-Xylene	2017/06/09		98	%	70 - 130
			o-Xylene	2017/06/09		94	%	70 - 130
			F1 (C6-C10)	2017/06/09		102	%	70 - 130
8657618	HG3	Spiked Blank	1,4-Difluorobenzene (sur.)	2017/06/09		100	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/09		107	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/09		102	%	70 - 130
			Benzene	2017/06/09		91	%	70 - 130
			Toluene	2017/06/09		88	%	70 - 130
			Ethylbenzene	2017/06/09		96	%	70 - 130
			m & p-Xylene	2017/06/09		99	%	70 - 130
			o-Xylene	2017/06/09		94	%	70 - 130
			F1 (C6-C10)	2017/06/09		117	%	70 - 130
8657618	HG3	Method Blank	1,4-Difluorobenzene (sur.)	2017/06/09		103	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/09		101	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/09		97	%	70 - 130
			Benzene	2017/06/09	<0.00040		mg/L	
			Toluene	2017/06/09	<0.00040		mg/L	
			Ethylbenzene	2017/06/09	<0.00040		mg/L	
			m & p-Xylene	2017/06/09	<0.00080		mg/L	
			o-Xylene	2017/06/09	<0.00040		mg/L	
			Xylenes (Total)	2017/06/09	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2017/06/09	<0.10		mg/L	
			F1 (C6-C10)	2017/06/09	<0.10		mg/L	
8657618	HG3	RPD	Benzene	2017/06/09	NC		%	30
			Toluene	2017/06/09	NC		%	30
			Ethylbenzene	2017/06/09	NC		%	30
			m & p-Xylene	2017/06/09	NC		%	30
			o-Xylene	2017/06/09	NC		%	30
			Xylenes (Total)	2017/06/09	NC		%	30
			F1 (C6-C10) - BTEX	2017/06/09	NC		%	30
			F1 (C6-C10)	2017/06/09	NC		%	30
8657627	HG3	Matrix Spike [RF6394-07]	1,4-Difluorobenzene (sur.)	2017/06/09		99	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/09		107	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/09		102	%	70 - 130
			Benzene	2017/06/09		94	%	70 - 130
			Toluene	2017/06/09		90	%	70 - 130
			Ethylbenzene	2017/06/09		98	%	70 - 130
			m & p-Xylene	2017/06/09		101	%	70 - 130
			o-Xylene	2017/06/09		96	%	70 - 130
			F1 (C6-C10)	2017/06/09		78	%	70 - 130
8657627	HG3	Spiked Blank	1,4-Difluorobenzene (sur.)	2017/06/09		99	%	70 - 130

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			4-Bromofluorobenzene (sur.)	2017/06/09		107	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/09		101	%	70 - 130
			Benzene	2017/06/09		97	%	70 - 130
			Toluene	2017/06/09		94	%	70 - 130
			Ethylbenzene	2017/06/09		104	%	70 - 130
			m & p-Xylene	2017/06/09		106	%	70 - 130
			o-Xylene	2017/06/09		101	%	70 - 130
			F1 (C6-C10)	2017/06/09		104	%	70 - 130
8657627	HG3	Method Blank	1,4-Difluorobenzene (sur.)	2017/06/09		99	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/09		101	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/09		97	%	70 - 130
			Benzene	2017/06/09	<0.00040		mg/L	
			Toluene	2017/06/09	<0.00040		mg/L	
			Ethylbenzene	2017/06/09	<0.00040		mg/L	
			m & p-Xylene	2017/06/09	<0.00080		mg/L	
			o-Xylene	2017/06/09	<0.00040		mg/L	
			Xylenes (Total)	2017/06/09	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2017/06/09	<0.10		mg/L	
			F1 (C6-C10)	2017/06/09	<0.10		mg/L	
8657627	HG3	RPD [RF6393-07]	Benzene	2017/06/09	NC		%	30
			Toluene	2017/06/09	NC		%	30
			Ethylbenzene	2017/06/09	NC		%	30
			m & p-Xylene	2017/06/09	NC		%	30
			o-Xylene	2017/06/09	NC		%	30
			Xylenes (Total)	2017/06/09	NC		%	30
			F1 (C6-C10) - BTEX	2017/06/09	NC		%	30
			F1 (C6-C10)	2017/06/09	NC		%	30
8657901	MRD	Matrix Spike [RF6347-03]	Total Chemical Oxygen Demand	2017/06/09		103	%	80 - 120
8657901	MRD	Spiked Blank	Total Chemical Oxygen Demand	2017/06/09		100	%	80 - 120
8657901	MRD	Method Blank	Total Chemical Oxygen Demand	2017/06/09	<5.0		mg/L	
8657901	MRD	RPD [RF6347-03]	Total Chemical Oxygen Demand	2017/06/09	19		%	20
8658529	APY	Matrix Spike	Dissolved Aluminum (Al)	2017/06/09		101	%	80 - 120
			Dissolved Antimony (Sb)	2017/06/09		107	%	80 - 120
			Dissolved Arsenic (As)	2017/06/09		100	%	80 - 120
			Dissolved Beryllium (Be)	2017/06/09		98	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/09		96	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/09		94	%	80 - 120
			Dissolved Copper (Cu)	2017/06/09		93	%	80 - 120
			Dissolved Lead (Pb)	2017/06/09		96	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/06/09		105	%	80 - 120
			Dissolved Nickel (Ni)	2017/06/09		93	%	80 - 120
			Dissolved Selenium (Se)	2017/06/09		105	%	80 - 120
			Dissolved Silver (Ag)	2017/06/09		101	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/09		100	%	80 - 120
			Dissolved Tin (Sn)	2017/06/09		107	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/09		100	%	80 - 120
			Dissolved Uranium (U)	2017/06/09		100	%	80 - 120
			Dissolved Vanadium (V)	2017/06/09		98	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/09		97	%	80 - 120
8658529	APY	Spiked Blank	Dissolved Aluminum (Al)	2017/06/09		100	%	80 - 120
			Dissolved Antimony (Sb)	2017/06/09		100	%	80 - 120
			Dissolved Arsenic (As)	2017/06/09		98	%	80 - 120

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			Dissolved Beryllium (Be)	2017/06/09		94	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/09		96	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/09		96	%	80 - 120
			Dissolved Copper (Cu)	2017/06/09		97	%	80 - 120
			Dissolved Lead (Pb)	2017/06/09		100	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/06/09		98	%	80 - 120
			Dissolved Nickel (Ni)	2017/06/09		97	%	80 - 120
			Dissolved Selenium (Se)	2017/06/09		101	%	80 - 120
			Dissolved Silver (Ag)	2017/06/09		100	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/09		104	%	80 - 120
			Dissolved Tin (Sn)	2017/06/09		101	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/09		96	%	80 - 120
			Dissolved Uranium (U)	2017/06/09		99	%	80 - 120
			Dissolved Vanadium (V)	2017/06/09		98	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/09		98	%	80 - 120
8658529	APY	Method Blank	Dissolved Aluminum (Al)	2017/06/12	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2017/06/12	<0.00060		mg/L	
			Dissolved Arsenic (As)	2017/06/12	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2017/06/12	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2017/06/12	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2017/06/12	<0.00030		mg/L	
			Dissolved Copper (Cu)	2017/06/12	<0.00020		mg/L	
			Dissolved Lead (Pb)	2017/06/12	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2017/06/12	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2017/06/12	<0.00050		mg/L	
			Dissolved Selenium (Se)	2017/06/12	<0.00020		mg/L	
			Dissolved Silver (Ag)	2017/06/12	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2017/06/12	<0.00020		mg/L	
			Dissolved Tin (Sn)	2017/06/12	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2017/06/12	<0.0010		mg/L	
			Dissolved Uranium (U)	2017/06/12	<0.00010		mg/L	
			Dissolved Vanadium (V)	2017/06/12	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2017/06/12	<0.0030		mg/L	
8658529	APY	RPD	Dissolved Aluminum (Al)	2017/06/09	NC		%	20
			Dissolved Antimony (Sb)	2017/06/09	NC		%	20
			Dissolved Arsenic (As)	2017/06/09	2.5		%	20
			Dissolved Beryllium (Be)	2017/06/09	NC		%	20
			Dissolved Chromium (Cr)	2017/06/09	NC		%	20
			Dissolved Cobalt (Co)	2017/06/09	2.8		%	20
			Dissolved Copper (Cu)	2017/06/09	18		%	20
			Dissolved Lead (Pb)	2017/06/09	NC		%	20
			Dissolved Molybdenum (Mo)	2017/06/09	5.9		%	20
			Dissolved Nickel (Ni)	2017/06/09	0.32		%	20
			Dissolved Selenium (Se)	2017/06/09	NC		%	20
			Dissolved Silver (Ag)	2017/06/09	NC		%	20
			Dissolved Thallium (Tl)	2017/06/09	NC		%	20
			Dissolved Tin (Sn)	2017/06/09	NC		%	20
			Dissolved Titanium (Ti)	2017/06/09	NC		%	20
			Dissolved Uranium (U)	2017/06/09	2.2		%	20
			Dissolved Vanadium (V)	2017/06/09	NC		%	20
			Dissolved Zinc (Zn)	2017/06/09	NC		%	20
8658531	APY	Matrix Spike [RF6345-02]	Dissolved Aluminum (Al)	2017/06/09		NC	%	80 - 120

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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Antimony (Sb)	2017/06/09		107	%	80 - 120
			Dissolved Arsenic (As)	2017/06/09		101	%	80 - 120
			Dissolved Beryllium (Be)	2017/06/09		95	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/09		93	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/09		91	%	80 - 120
			Dissolved Copper (Cu)	2017/06/09		88	%	80 - 120
			Dissolved Lead (Pb)	2017/06/09		91	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/06/09		105	%	80 - 120
			Dissolved Nickel (Ni)	2017/06/09		91	%	80 - 120
			Dissolved Selenium (Se)	2017/06/09		99	%	80 - 120
			Dissolved Silver (Ag)	2017/06/09		93	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/09		92	%	80 - 120
			Dissolved Tin (Sn)	2017/06/09		104	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/09		101	%	80 - 120
			Dissolved Uranium (U)	2017/06/09		95	%	80 - 120
			Dissolved Vanadium (V)	2017/06/09		101	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/09		92	%	80 - 120
8658531	APY	Spiked Blank	Dissolved Aluminum (Al)	2017/06/09		100	%	80 - 120
			Dissolved Antimony (Sb)	2017/06/09		101	%	80 - 120
			Dissolved Arsenic (As)	2017/06/09		98	%	80 - 120
			Dissolved Beryllium (Be)	2017/06/09		96	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/09		98	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/09		97	%	80 - 120
			Dissolved Copper (Cu)	2017/06/09		96	%	80 - 120
			Dissolved Lead (Pb)	2017/06/09		100	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/06/09		98	%	80 - 120
			Dissolved Nickel (Ni)	2017/06/09		97	%	80 - 120
			Dissolved Selenium (Se)	2017/06/09		104	%	80 - 120
			Dissolved Silver (Ag)	2017/06/09		101	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/09		103	%	80 - 120
			Dissolved Tin (Sn)	2017/06/09		100	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/09		94	%	80 - 120
			Dissolved Uranium (U)	2017/06/09		98	%	80 - 120
			Dissolved Vanadium (V)	2017/06/09		99	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/09		98	%	80 - 120
8658531	APY	Method Blank	Dissolved Aluminum (Al)	2017/06/12	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2017/06/12	<0.00060		mg/L	
			Dissolved Arsenic (As)	2017/06/12	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2017/06/12	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2017/06/12	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2017/06/12	<0.00030		mg/L	
			Dissolved Copper (Cu)	2017/06/12	<0.00020		mg/L	
			Dissolved Lead (Pb)	2017/06/12	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2017/06/12	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2017/06/12	<0.00050		mg/L	
			Dissolved Selenium (Se)	2017/06/12	<0.00020		mg/L	
			Dissolved Silver (Ag)	2017/06/12	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2017/06/12	<0.00020		mg/L	
			Dissolved Tin (Sn)	2017/06/12	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2017/06/12	<0.0010		mg/L	
			Dissolved Uranium (U)	2017/06/12	<0.00010		mg/L	
			Dissolved Vanadium (V)	2017/06/12	<0.0010		mg/L	

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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Zinc (Zn)	2017/06/12	<0.0030		mg/L	
8658531	APY	RPD [RF6345-02]	Dissolved Aluminum (Al)	2017/06/09	1.3		%	20
			Dissolved Antimony (Sb)	2017/06/09	NC		%	20
			Dissolved Arsenic (As)	2017/06/09	3.7		%	20
			Dissolved Beryllium (Be)	2017/06/09	NC		%	20
			Dissolved Chromium (Cr)	2017/06/09	NC		%	20
			Dissolved Cobalt (Co)	2017/06/09	5.6		%	20
			Dissolved Copper (Cu)	2017/06/09	13		%	20
			Dissolved Lead (Pb)	2017/06/09	NC		%	20
			Dissolved Molybdenum (Mo)	2017/06/09	2.4		%	20
			Dissolved Nickel (Ni)	2017/06/09	1.1		%	20
			Dissolved Selenium (Se)	2017/06/09	NC		%	20
			Dissolved Silver (Ag)	2017/06/09	NC		%	20
			Dissolved Thallium (Tl)	2017/06/09	NC		%	20
			Dissolved Tin (Sn)	2017/06/09	NC		%	20
			Dissolved Titanium (Ti)	2017/06/09	NC		%	20
			Dissolved Uranium (U)	2017/06/09	2.1		%	20
			Dissolved Vanadium (V)	2017/06/09	NC		%	20
			Dissolved Zinc (Zn)	2017/06/09	NC		%	20
8658925	KHO	Matrix Spike	O-TERPHENYL (sur.)	2017/06/10		82	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/10		93	%	60 - 130
8658925	KHO	Spiked Blank	O-TERPHENYL (sur.)	2017/06/10		84	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/10		96	%	70 - 130
8658925	KHO	Method Blank	O-TERPHENYL (sur.)	2017/06/10		82	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/10	<0.10		mg/L	
8658925	KHO	RPD	F2 (C10-C16 Hydrocarbons)	2017/06/10	NC		%	30
8659163	LMD	Matrix Spike [RF6344-01]	Dissolved Nitrite (N)	2017/06/15		99	%	80 - 120
			Dissolved Nitrate (N)	2017/06/15		99	%	80 - 120
8659163	LMD	Spiked Blank	Dissolved Nitrite (N)	2017/06/15		99	%	80 - 120
			Dissolved Nitrate (N)	2017/06/15		99	%	80 - 120
8659163	LMD	Method Blank	Dissolved Nitrite (N)	2017/06/15	<0.010		mg/L	
			Dissolved Nitrate (N)	2017/06/15	<0.010		mg/L	
8659163	LMD	RPD [RF6344-01]	Dissolved Nitrite (N)	2017/06/15	NC		%	20
			Dissolved Nitrate (N)	2017/06/15	NC		%	20
8659220	LMD	Matrix Spike [RF6452-01]	Dissolved Nitrite (N)	2017/06/14		103	%	80 - 120
			Dissolved Nitrate (N)	2017/06/14		104	%	80 - 120
8659220	LMD	Spiked Blank	Dissolved Nitrite (N)	2017/06/14		100	%	80 - 120
			Dissolved Nitrate (N)	2017/06/14		101	%	80 - 120
8659220	LMD	Method Blank	Dissolved Nitrite (N)	2017/06/14	<0.010		mg/L	
			Dissolved Nitrate (N)	2017/06/14	<0.010		mg/L	
8659220	LMD	RPD [RF6452-01]	Dissolved Nitrite (N)	2017/06/14	NC		%	20
			Dissolved Nitrate (N)	2017/06/14	NC		%	20
8659872	MA4	Spiked Blank	pH	2017/06/12		101	%	97 - 103
8659872	MA4	RPD [RF6390-01]	pH	2017/06/12	0.13		%	N/A
8659873	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2017/06/12		101	%	80 - 120
8659873	MA4	Method Blank	Alkalinity (PP as CaCO3)	2017/06/12	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2017/06/12	<0.50		mg/L	
			Bicarbonate (HCO3)	2017/06/12	<0.50		mg/L	
			Carbonate (CO3)	2017/06/12	<0.50		mg/L	
			Hydroxide (OH)	2017/06/12	<0.50		mg/L	
8659873	MA4	RPD [RF6390-01]	Alkalinity (PP as CaCO3)	2017/06/12	0.27		%	20
			Alkalinity (Total as CaCO3)	2017/06/12	0.52		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

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			Bicarbonate (HCO3)	2017/06/12	0.53		%	20
			Carbonate (CO3)	2017/06/12	0.27		%	20
			Hydroxide (OH)	2017/06/12	NC		%	20
8659874	MA4	Spiked Blank	Conductivity	2017/06/12		100	%	90 - 110
8659874	MA4	Method Blank	Conductivity	2017/06/12	<1.0		uS/cm	
8659874	MA4	RPD [RF6390-01]	Conductivity	2017/06/12	0.49		%	10
8659894	MA4	Spiked Blank	pH	2017/06/12		100	%	97 - 103
8659894	MA4	RPD [RF6453-01]	pH	2017/06/12	0.16		%	N/A
8659895	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2017/06/12		100	%	80 - 120
8659895	MA4	Method Blank	Alkalinity (PP as CaCO3)	2017/06/12	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2017/06/12	<0.50		mg/L	
			Bicarbonate (HCO3)	2017/06/12	<0.50		mg/L	
			Carbonate (CO3)	2017/06/12	<0.50		mg/L	
			Hydroxide (OH)	2017/06/12	<0.50		mg/L	
8659895	MA4	RPD [RF6453-01]	Alkalinity (PP as CaCO3)	2017/06/12	13		%	20
			Alkalinity (Total as CaCO3)	2017/06/12	0.42		%	20
			Bicarbonate (HCO3)	2017/06/12	0.014		%	20
			Carbonate (CO3)	2017/06/12	13		%	20
			Hydroxide (OH)	2017/06/12	NC		%	20
8659896	MA4	Spiked Blank	Conductivity	2017/06/12		100	%	90 - 110
8659896	MA4	Method Blank	Conductivity	2017/06/12	<1.0		uS/cm	
8659896	MA4	RPD [RF6453-01]	Conductivity	2017/06/12	0.063		%	10
8659993	CH7	Matrix Spike [RF6345-01]	Dissolved Chloride (Cl)	2017/06/12		NC	%	80 - 120
8659993	CH7	Spiked Blank	Dissolved Chloride (Cl)	2017/06/12		102	%	80 - 120
8659993	CH7	Method Blank	Dissolved Chloride (Cl)	2017/06/12	<1.0		mg/L	
8659993	CH7	RPD [RF6345-01]	Dissolved Chloride (Cl)	2017/06/12	0.68		%	20
8659997	CH7	Matrix Spike [RF6345-01]	Dissolved Sulphate (SO4)	2017/06/12		NC	%	80 - 120
8659997	CH7	Spiked Blank	Dissolved Sulphate (SO4)	2017/06/12		103	%	80 - 120
8659997	CH7	Method Blank	Dissolved Sulphate (SO4)	2017/06/12	<1.0		mg/L	
8659997	CH7	RPD [RF6345-01]	Dissolved Sulphate (SO4)	2017/06/12	1.1		%	20
8660028	CH7	Matrix Spike	Dissolved Chloride (Cl)	2017/06/12		108	%	80 - 120
8660028	CH7	Spiked Blank	Dissolved Chloride (Cl)	2017/06/12		106	%	80 - 120
8660028	CH7	Method Blank	Dissolved Chloride (Cl)	2017/06/12	<1.0		mg/L	
8660028	CH7	RPD	Dissolved Chloride (Cl)	2017/06/12	2.6		%	20
8660035	CH7	Matrix Spike	Dissolved Sulphate (SO4)	2017/06/12		NC	%	80 - 120
8660035	CH7	Spiked Blank	Dissolved Sulphate (SO4)	2017/06/12		105	%	80 - 120
8660035	CH7	Method Blank	Dissolved Sulphate (SO4)	2017/06/12	<1.0		mg/L	
8660035	CH7	RPD	Dissolved Sulphate (SO4)	2017/06/12	0.87		%	20
8660227	TMU	Matrix Spike	Dissolved Organic Carbon (C)	2017/06/12		NC	%	80 - 120
8660227	TMU	Spiked Blank	Dissolved Organic Carbon (C)	2017/06/12		105	%	80 - 120
8660227	TMU	Method Blank	Dissolved Organic Carbon (C)	2017/06/12	<0.50		mg/L	
8660227	TMU	RPD	Dissolved Organic Carbon (C)	2017/06/12	1.0		%	20
8660658	APY	Matrix Spike	Dissolved Aluminum (Al)	2017/06/12		98	%	80 - 120
			Dissolved Antimony (Sb)	2017/06/12		101	%	80 - 120
			Dissolved Arsenic (As)	2017/06/12		99	%	80 - 120
			Dissolved Beryllium (Be)	2017/06/12		100	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/12		99	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/12		95	%	80 - 120
			Dissolved Copper (Cu)	2017/06/12		96	%	80 - 120
			Dissolved Lead (Pb)	2017/06/12		95	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/06/12		104	%	80 - 120
			Dissolved Nickel (Ni)	2017/06/12		95	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Selenium (Se)	2017/06/12		108	%	80 - 120
			Dissolved Silver (Ag)	2017/06/12		100	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/12		99	%	80 - 120
			Dissolved Tin (Sn)	2017/06/12		102	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/12		103	%	80 - 120
			Dissolved Uranium (U)	2017/06/12		98	%	80 - 120
			Dissolved Vanadium (V)	2017/06/12		101	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/12		96	%	80 - 120
8660658	APY	Spiked Blank	Dissolved Aluminum (Al)	2017/06/12		102	%	80 - 120
			Dissolved Antimony (Sb)	2017/06/12		97	%	80 - 120
			Dissolved Arsenic (As)	2017/06/12		100	%	80 - 120
			Dissolved Beryllium (Be)	2017/06/12		100	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/12		100	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/12		100	%	80 - 120
			Dissolved Copper (Cu)	2017/06/12		101	%	80 - 120
			Dissolved Lead (Pb)	2017/06/12		100	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/06/12		99	%	80 - 120
			Dissolved Nickel (Ni)	2017/06/12		101	%	80 - 120
			Dissolved Selenium (Se)	2017/06/12		106	%	80 - 120
			Dissolved Silver (Ag)	2017/06/12		103	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/12		105	%	80 - 120
			Dissolved Tin (Sn)	2017/06/12		99	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/12		103	%	80 - 120
			Dissolved Uranium (U)	2017/06/12		100	%	80 - 120
			Dissolved Vanadium (V)	2017/06/12		102	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/12		101	%	80 - 120
8660658	APY	Method Blank	Dissolved Aluminum (Al)	2017/06/12	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2017/06/12	<0.00060		mg/L	
			Dissolved Arsenic (As)	2017/06/12	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2017/06/12	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2017/06/12	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2017/06/12	<0.00030		mg/L	
			Dissolved Copper (Cu)	2017/06/12	<0.00020		mg/L	
			Dissolved Lead (Pb)	2017/06/12	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2017/06/12	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2017/06/12	<0.00050		mg/L	
			Dissolved Selenium (Se)	2017/06/12	<0.00020		mg/L	
			Dissolved Silver (Ag)	2017/06/12	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2017/06/12	<0.00020		mg/L	
			Dissolved Tin (Sn)	2017/06/12	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2017/06/12	<0.0010		mg/L	
			Dissolved Uranium (U)	2017/06/12	<0.00010		mg/L	
			Dissolved Vanadium (V)	2017/06/12	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2017/06/12	<0.0030		mg/L	
8660658	APY	RPD	Dissolved Aluminum (Al)	2017/06/12	5.0		%	20
			Dissolved Antimony (Sb)	2017/06/12	NC		%	20
			Dissolved Arsenic (As)	2017/06/12	9.8		%	20
			Dissolved Beryllium (Be)	2017/06/12	NC		%	20
			Dissolved Chromium (Cr)	2017/06/12	NC		%	20
			Dissolved Cobalt (Co)	2017/06/12	9.2		%	20
			Dissolved Copper (Cu)	2017/06/12	2.1		%	20
			Dissolved Lead (Pb)	2017/06/12	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Molybdenum (Mo)	2017/06/12	NC		%	20
			Dissolved Nickel (Ni)	2017/06/12	4.7		%	20
			Dissolved Selenium (Se)	2017/06/12	1.9		%	20
			Dissolved Silver (Ag)	2017/06/12	NC		%	20
			Dissolved Thallium (Tl)	2017/06/12	NC		%	20
			Dissolved Tin (Sn)	2017/06/12	NC		%	20
			Dissolved Titanium (Ti)	2017/06/12	NC		%	20
			Dissolved Uranium (U)	2017/06/12	2.6		%	20
			Dissolved Vanadium (V)	2017/06/12	NC		%	20
			Dissolved Zinc (Zn)	2017/06/12	5.9		%	20
8661067	JK9	Matrix Spike	Dissolved Barium (Ba)	2017/06/12		98	%	80 - 120
			Dissolved Boron (B)	2017/06/12		102	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/12		85	%	80 - 120
			Dissolved Iron (Fe)	2017/06/12		102	%	80 - 120
			Dissolved Lithium (Li)	2017/06/12		101	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/12		98	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/12		96	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/12		108	%	80 - 120
			Dissolved Potassium (K)	2017/06/12		100	%	80 - 120
			Dissolved Silicon (Si)	2017/06/12		96	%	80 - 120
			Dissolved Sodium (Na)	2017/06/12		NC	%	80 - 120
			Dissolved Strontium (Sr)	2017/06/12		94	%	80 - 120
8661067	JK9	Spiked Blank	Dissolved Barium (Ba)	2017/06/12		97	%	80 - 120
			Dissolved Boron (B)	2017/06/12		100	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/12		96	%	80 - 120
			Dissolved Iron (Fe)	2017/06/12		103	%	80 - 120
			Dissolved Lithium (Li)	2017/06/12		100	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/12		102	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/12		97	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/12		102	%	80 - 120
			Dissolved Potassium (K)	2017/06/12		100	%	80 - 120
			Dissolved Silicon (Si)	2017/06/12		107	%	80 - 120
			Dissolved Sodium (Na)	2017/06/12		99	%	80 - 120
			Dissolved Strontium (Sr)	2017/06/12		98	%	80 - 120
8661067	JK9	Method Blank	Dissolved Barium (Ba)	2017/06/12	<0.010		mg/L	
			Dissolved Boron (B)	2017/06/12	<0.020		mg/L	
			Dissolved Calcium (Ca)	2017/06/12	<0.30		mg/L	
			Dissolved Iron (Fe)	2017/06/12	<0.060		mg/L	
			Dissolved Lithium (Li)	2017/06/12	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2017/06/12	<0.20		mg/L	
			Dissolved Manganese (Mn)	2017/06/12	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2017/06/12	<0.10		mg/L	
			Dissolved Potassium (K)	2017/06/12	<0.30		mg/L	
			Dissolved Silicon (Si)	2017/06/12	<0.10		mg/L	
			Dissolved Sodium (Na)	2017/06/12	<0.50		mg/L	
			Dissolved Strontium (Sr)	2017/06/12	<0.020		mg/L	
			Dissolved Sulphur (S)	2017/06/12	<0.20		mg/L	
8661067	JK9	RPD	Dissolved Barium (Ba)	2017/06/12	2.1		%	20
			Dissolved Boron (B)	2017/06/12	3.6		%	20
			Dissolved Calcium (Ca)	2017/06/12	2.4		%	20
			Dissolved Iron (Fe)	2017/06/12	0.96		%	20
			Dissolved Lithium (Li)	2017/06/12	1.0		%	20

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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Magnesium (Mg)	2017/06/12	2.1		%	20
			Dissolved Manganese (Mn)	2017/06/12	4.2		%	20
			Dissolved Phosphorus (P)	2017/06/12	8.1		%	20
			Dissolved Potassium (K)	2017/06/12	2.2		%	20
			Dissolved Silicon (Si)	2017/06/12	1.0		%	20
			Dissolved Sodium (Na)	2017/06/12	1.4		%	20
			Dissolved Strontium (Sr)	2017/06/12	2.2		%	20
			Dissolved Sulphur (S)	2017/06/12	4.2		%	20
8661325	AF6	Matrix Spike [RF6391-03]	Total Total Kjeldahl Nitrogen	2017/06/14		97	%	80 - 120
8661325	AF6	QC Standard	Total Total Kjeldahl Nitrogen	2017/06/14		99	%	80 - 120
8661325	AF6	Spiked Blank	Total Total Kjeldahl Nitrogen	2017/06/14		107	%	80 - 120
8661325	AF6	Method Blank	Total Total Kjeldahl Nitrogen	2017/06/14	<0.050		mg/L	
8661325	AF6	RPD [RF6391-03]	Total Total Kjeldahl Nitrogen	2017/06/14	1.1		%	20
8661481	NP4	Matrix Spike	Dissolved Mercury (Hg)	2017/06/13		93	%	85 - 115
8661481	NP4	QC Standard	Dissolved Mercury (Hg)	2017/06/13		108	%	85 - 115
8661481	NP4	Spiked Blank	Dissolved Mercury (Hg)	2017/06/13		106	%	85 - 115
8661481	NP4	Method Blank	Dissolved Mercury (Hg)	2017/06/13	<0.0020		ug/L	
8661481	NP4	RPD	Dissolved Mercury (Hg)	2017/06/13	NC		%	20
8661671	TMU	Matrix Spike	Dissolved Organic Carbon (C)	2017/06/13		NC	%	80 - 120
8661671	TMU	Spiked Blank	Dissolved Organic Carbon (C)	2017/06/13		105	%	80 - 120
8661671	TMU	Method Blank	Dissolved Organic Carbon (C)	2017/06/13	<0.50		mg/L	
8661671	TMU	RPD	Dissolved Organic Carbon (C)	2017/06/13	1.0		%	20
8661680	CJ5	Matrix Spike	Dissolved Barium (Ba)	2017/06/13		98	%	80 - 120
			Dissolved Boron (B)	2017/06/13		106	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/13		NC	%	80 - 120
			Dissolved Iron (Fe)	2017/06/13		100	%	80 - 120
			Dissolved Lithium (Li)	2017/06/13		95	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/13		99	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/13		97	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/13		102	%	80 - 120
			Dissolved Potassium (K)	2017/06/13		101	%	80 - 120
			Dissolved Silicon (Si)	2017/06/13		89	%	80 - 120
			Dissolved Sodium (Na)	2017/06/13		93	%	80 - 120
			Dissolved Strontium (Sr)	2017/06/13		94	%	80 - 120
8661680	CJ5	Spiked Blank	Dissolved Barium (Ba)	2017/06/13		95	%	80 - 120
			Dissolved Boron (B)	2017/06/13		102	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/13		99	%	80 - 120
			Dissolved Iron (Fe)	2017/06/13		101	%	80 - 120
			Dissolved Lithium (Li)	2017/06/13		95	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/13		97	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/13		99	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/13		100	%	80 - 120
			Dissolved Potassium (K)	2017/06/13		100	%	80 - 120
			Dissolved Silicon (Si)	2017/06/13		99	%	80 - 120
			Dissolved Sodium (Na)	2017/06/13		97	%	80 - 120
			Dissolved Strontium (Sr)	2017/06/13		93	%	80 - 120
8661680	CJ5	Method Blank	Dissolved Barium (Ba)	2017/06/13	<0.010		mg/L	
			Dissolved Boron (B)	2017/06/13	<0.020		mg/L	
			Dissolved Calcium (Ca)	2017/06/13	<0.30		mg/L	
			Dissolved Iron (Fe)	2017/06/13	<0.060		mg/L	
			Dissolved Lithium (Li)	2017/06/13	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2017/06/13	<0.20		mg/L	

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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Manganese (Mn)	2017/06/13	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2017/06/13	<0.10		mg/L	
			Dissolved Potassium (K)	2017/06/13	<0.30		mg/L	
			Dissolved Silicon (Si)	2017/06/13	<0.10		mg/L	
			Dissolved Sodium (Na)	2017/06/13	<0.50		mg/L	
			Dissolved Strontium (Sr)	2017/06/13	<0.020		mg/L	
			Dissolved Sulphur (S)	2017/06/13	<0.20		mg/L	
8661680	CJ5	RPD	Dissolved Calcium (Ca)	2017/06/13	0.27		%	20
			Dissolved Iron (Fe)	2017/06/13	5.6		%	20
			Dissolved Magnesium (Mg)	2017/06/13	0.19		%	20
			Dissolved Manganese (Mn)	2017/06/13	0.15		%	20
			Dissolved Potassium (K)	2017/06/13	0.65		%	20
			Dissolved Sodium (Na)	2017/06/13	0.32		%	20
8661706	JLD	Matrix Spike	Total Ammonia (N)	2017/06/13		99	%	80 - 120
8661706	JLD	Spiked Blank	Total Ammonia (N)	2017/06/13		108	%	80 - 120
8661706	JLD	Method Blank	Total Ammonia (N)	2017/06/13	<0.015		mg/L	
8661706	JLD	RPD	Total Ammonia (N)	2017/06/13	0		%	20
8661710	JLD	Matrix Spike [RF6351-03]	Total Ammonia (N)	2017/06/13		98	%	80 - 120
8661710	JLD	Spiked Blank	Total Ammonia (N)	2017/06/13		103	%	80 - 120
8661710	JLD	Method Blank	Total Ammonia (N)	2017/06/13	<0.015		mg/L	
8661710	JLD	RPD [RF6351-03]	Total Ammonia (N)	2017/06/13	NC		%	20
8661719	JLD	Matrix Spike	Total Ammonia (N)	2017/06/13		92	%	80 - 120
8661719	JLD	Spiked Blank	Total Ammonia (N)	2017/06/13		102	%	80 - 120
8661719	JLD	Method Blank	Total Ammonia (N)	2017/06/13	<0.015		mg/L	
8661719	JLD	RPD	Total Ammonia (N)	2017/06/13	NC		%	20
8661729	JLD	Matrix Spike [RF6453-03]	Total Ammonia (N)	2017/06/13		87	%	80 - 120
8661729	JLD	Spiked Blank	Total Ammonia (N)	2017/06/13		107	%	80 - 120
8661729	JLD	Method Blank	Total Ammonia (N)	2017/06/13	<0.015		mg/L	
8661729	JLD	RPD [RF6453-03]	Total Ammonia (N)	2017/06/13	2.5		%	20
8661951	JK9	Matrix Spike [RF6346-02]	Dissolved Barium (Ba)	2017/06/13		99	%	80 - 120
			Dissolved Boron (B)	2017/06/13		99	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/13		NC	%	80 - 120
			Dissolved Iron (Fe)	2017/06/13		104	%	80 - 120
			Dissolved Lithium (Li)	2017/06/13		101	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/13		NC	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/13		99	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/13		92	%	80 - 120
			Dissolved Potassium (K)	2017/06/13		98	%	80 - 120
			Dissolved Silicon (Si)	2017/06/13		94	%	80 - 120
			Dissolved Sodium (Na)	2017/06/13		NC	%	80 - 120
			Dissolved Strontium (Sr)	2017/06/13		NC	%	80 - 120
8661951	JK9	Spiked Blank	Dissolved Barium (Ba)	2017/06/13		96	%	80 - 120
			Dissolved Boron (B)	2017/06/13		98	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/13		101	%	80 - 120
			Dissolved Iron (Fe)	2017/06/13		102	%	80 - 120
			Dissolved Lithium (Li)	2017/06/13		95	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/13		101	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/13		97	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/13		98	%	80 - 120
			Dissolved Potassium (K)	2017/06/13		97	%	80 - 120
			Dissolved Silicon (Si)	2017/06/13		105	%	80 - 120
			Dissolved Sodium (Na)	2017/06/13		97	%	80 - 120

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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Strontium (Sr)	2017/06/13		96	%	80 - 120
8661951	JK9	Method Blank	Dissolved Barium (Ba)	2017/06/13	<0.010		mg/L	
			Dissolved Boron (B)	2017/06/13	<0.020		mg/L	
			Dissolved Calcium (Ca)	2017/06/13	<0.30		mg/L	
			Dissolved Iron (Fe)	2017/06/13	<0.060		mg/L	
			Dissolved Lithium (Li)	2017/06/13	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2017/06/13	<0.20		mg/L	
			Dissolved Manganese (Mn)	2017/06/13	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2017/06/13	<0.10		mg/L	
			Dissolved Potassium (K)	2017/06/13	<0.30		mg/L	
			Dissolved Silicon (Si)	2017/06/13	<0.10		mg/L	
			Dissolved Sodium (Na)	2017/06/13	<0.50		mg/L	
			Dissolved Strontium (Sr)	2017/06/13	<0.020		mg/L	
			Dissolved Sulphur (S)	2017/06/13	<0.20		mg/L	
8661951	JK9	RPD [RF6346-02]	Dissolved Barium (Ba)	2017/06/13	NC		%	20
			Dissolved Boron (B)	2017/06/13	2.7		%	20
			Dissolved Calcium (Ca)	2017/06/13	0.30		%	20
			Dissolved Iron (Fe)	2017/06/13	NC		%	20
			Dissolved Lithium (Li)	2017/06/13	4.2		%	20
			Dissolved Magnesium (Mg)	2017/06/13	0.21		%	20
			Dissolved Manganese (Mn)	2017/06/13	0.15		%	20
			Dissolved Phosphorus (P)	2017/06/13	NC		%	20
			Dissolved Potassium (K)	2017/06/13	4.8		%	20
			Dissolved Silicon (Si)	2017/06/13	2.9		%	20
			Dissolved Sodium (Na)	2017/06/13	0.37		%	20
			Dissolved Strontium (Sr)	2017/06/13	0.35		%	20
			Dissolved Sulphur (S)	2017/06/13	0.033		%	20
8661983	AF6	Matrix Spike	Total Total Kjeldahl Nitrogen	2017/06/14		90	%	80 - 120
8661983	AF6	QC Standard	Total Total Kjeldahl Nitrogen	2017/06/14		98	%	80 - 120
8661983	AF6	Spiked Blank	Total Total Kjeldahl Nitrogen	2017/06/14		106	%	80 - 120
8661983	AF6	Method Blank	Total Total Kjeldahl Nitrogen	2017/06/14	<0.050		mg/L	
8661983	AF6	RPD	Total Total Kjeldahl Nitrogen	2017/06/14	11		%	20
8662315	YY	Matrix Spike	Dissolved Organic Carbon (C)	2017/06/13		NC	%	80 - 120
8662315	YY	Spiked Blank	Dissolved Organic Carbon (C)	2017/06/13		108	%	80 - 120
8662315	YY	Method Blank	Dissolved Organic Carbon (C)	2017/06/13	<0.50		mg/L	
8662315	YY	RPD	Dissolved Organic Carbon (C)	2017/06/13	1.2		%	20
8662721	NP4	Matrix Spike [RF6345-05]	Dissolved Mercury (Hg)	2017/06/14		96	%	85 - 115
8662721	NP4	QC Standard	Dissolved Mercury (Hg)	2017/06/14		106	%	85 - 115
8662721	NP4	Spiked Blank	Dissolved Mercury (Hg)	2017/06/14		101	%	85 - 115
8662721	NP4	Method Blank	Dissolved Mercury (Hg)	2017/06/14	<0.0020		ug/L	

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TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Location: RYLEY LANDFILL
Sampler Initials: BS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8662721	NP4	RPD [RF6345-05]	Dissolved Mercury (Hg)	2017/06/14	NC		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Site Location: RYLEY LANDFILL
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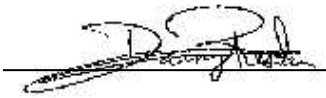
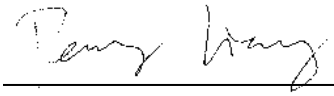
VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

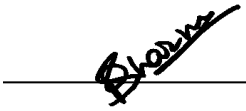


Daniel Reslan, cCT, QP, Organics Supervisor

Justin Geisel, B.Sc., Organics Supervisor

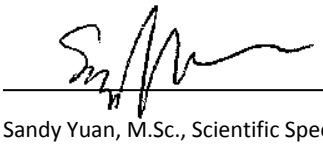


Harry (Peng) Liang, Senior Analyst



Poonam Sharma, cCT, Organics Supervisor

Suwan Fock, B.Sc., QP, Inorganics Senior Analyst



Sandy Yuan, M.Sc., Scientific Specialist

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

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ADDITIONAL COOLER TEMPERATURE RECORD

CHAIN-OF-CUSTODY RECORD

CHAIN OF CUSTODY #: D-1 20170606

Page	Chain of Custody
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COOLER OBSERVATIONS:

MAXXAM JOB#: B744752

Custody Seal Present (YES / NO)	Custody Seal Intact (YES / NO)	Ice Present (YES / NO)	Cooler ID	Temp 1	Temp 2	Temp 3
NO ✓	NO ✓	YES ✓		10	10	10
NO ✓	NO ✓	YES ✓		7	3	9
NO ✓	NO ✓	YES ✓		9	4	10
NO ✓	NO ✓	YES ✓		8	7	8

Custody Seal Present (YES / NO)	Custody Seal Intact (YES / NO)	Ice Present (YES / NO)	Cooler ID	Temp 1	Temp 2	Temp 3

RECEIVED BY (SIGN & PRINT)	DATE (YYYY/MM/DD)	TIME (HH:MM)
[signature] David Tidman	20170606	1702

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Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
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293(4)

CHAIN OF CUSTODY RECORD

M056729

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company: TetraTech	Company:	Quotation #: B60516	☒ 5 - 7 Days Regular (Most analyses)
Contact Name: Michele Crawford	Contact Name:	P.O. #/ AFE#: ~~707 ENW~~ 704-SWM.S.WOP03652-01	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 14940 123 Ave Edmonton, AB	Address:	Project #: 704-SWM.S.WOP03652-01	Rush TAT (Surcharges will be applied)
Phone: 780 451 2121	Phone:	Site Location: Ryley Landfill	☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Email: Michele.crawford@tetratech.com	Email:	Site #:	Date Required:
Copies: Brent.Schmidt@Tetratech.com	Copies:	Sampled By: BS	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID	Temp		
Seal Present			See ACTR			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID	Temp		
Seal Present						
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID	Temp		
Seal Present						
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☐	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals ☒ Tot ☐ Diss	Mercury ☐ Total ☒ Dissolved	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	Ammonia-N (Total)	TKN + COD	Carbon (DOC)	PAH (GC/MS)	HOLD - DO NOT ANALYZE
1	MW-8A		2017/06/06	1450	water	9		X		X	X	X					X	X	X		
2	MW-8B			1500		9		X		X	X	X					X	X	X		
3	MW-5A			1420		9		X		X	X	X					X	X	X		
4	MW-5B			1435		8		X		X	X	X					X	X	X		
5	MW-12A			1300		9		X		X	X	X					X	X	X		
6	MW-12B			1255		9		X		X	X	X					X	X	X		
7	MW-24A			1400		9		X		X	X	X					X	X	X		
8	MW-24B			1410		9		X		X	X	X					X	X	X		
9	MW-1B			1240		6		X		X	X	X							X		
10	MW-20A		↓	910	↓	9		X		X	X	X					X	X	X		
	Please indicate Filtered, Preserved or Both (F, P, F/P)							P			F/P	F/P					P	P	F/P		

Regulatory Criteria

☐ AT1
☐ CCME
☐ Drinking Water
☐ D50 (Drilling Waste)
☐ Saskatchewan
☐ Other:

Special Instructions

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Brent Schmidt	2017/06/06	16:55	David Tidman	2017/06/06	1702	~~B744~~ B744752

AB FCD-00331/7

Maxxam
A Bureau Veritas Group Company

Calgary: 4000 19th St. NE, T2E 6P8. Toll Free (800) 386-7247
Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

CHAIN OF CUSTODY RECORD

M 056730

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company :	Company:	Quotation #:	☐ 5 - 7 Days Regular (Most analyses)
Contact Name: SAME AS	Contact Name:	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: PAGE 1	Address:		Rush TAT (Surcharges will be applied)
Phone:	Phone:	Project #:	☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Email:	Email:	Site Location:	Date Required:
Copies:	Copies:	Site #:	Rush Confirmation #:
		Sampled By:	

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present			Temp	See ALTR		
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Regulatory Criteria

☐ AT1 ☐ CCME ☐ Drinking Water ☐ D50 (Drilling Waste) ☐ Saskatchewan ☐ Other:

Special Instructions

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☐	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals ☒ Tot ☐ Diss	Mercury ☑ Total ☐ Dissolved	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	Ammonia-N (total)	TKN + COD	Carbon (DOC)	PAH (GC/MS)	HOLD - DO NOT ANALYZE	Special Instructions
1	MW-21A		2017/06/06	930	water	9		X		X	X	X					X	X	X			MW-31A - not filtered or preserved
2	MW-25A			1000		11		X		X	X	X					X	X	XX			
3	MW-26A			1010		6		X		XX							XX	X				MW-35Deep - not filtered or preserved
4	MW-31A			1030		8		X		X	X	X					X	X	X			
5	MW-33A			1140		9		X		X	X	X					X	X	X			
6	MW-33B			1130		9		X		X	X	X					X	X	X			
7	MW-34A			1330		9		X		X	X	X					X	X	X			MW-26A - not filtered or preserved
8	MW-34B			1345		9		X		X	X	X					X	X	X			
9	MW-35Deep			830		9		X		X	X	X					X	X	X			
10	MW-35A		↓	845	↓	5		X		X	X	X										
	Please indicate Filtered, Preserved or Both (F, P, F/P)							P			F/P	F/P					P	P	F/P			

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Brent Schmidt	2017/06/06	16:55	David T. Dmyn	20170606	1702	B744752

AB FCD-00331/7

Maxxam
A Bureau Veritas Group Company

Calgary: 4000 19th St. NE, T2E 6P8. Toll Free (800) 386-7247
Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

CHAIN OF CUSTODY RECORD

M056727

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company :	Company:	Quotation #:	☐ 5 - 7 Days Regular (Most analyses)
Contact Name: SAME AS	Contact Name:	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: PAGE 1	Address:	Project #:	Rush TAT (Surcharges will be applied)
Phone:	Phone:	Site Location:	☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Email:	Email:	Site #:	Date Required:
Copies:	Copies:	Sampled By:	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present			See ACTR			
Seal Intact			Temp			
Cooling Media						
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☐	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals Tot ☑ Diss ☐	Mercury Total ☑ Dissolved ☐	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	Ammonia-N (total)	TKN + COD	carbon (DOC)	PAH (GC/MS)	HOLD - DO NOT ANALYZE
1	MW-36Deep		2017/06/06	1045	water	9		X		X	X	X					X	X	X		
2	MW-36A			1100		9		X		X	X	X					X	X	X		
3	17TB					11		X				X									
4	17FB01			1200		9					X	X							X		
5	17Duplicate4					9		X		X	X	X					X	X	X		
6	17Duplicate5					9		X		X	X	X					X	X	X		
7																					
8																					
9																					
10																					

Please indicate Filtered, Preserved or Both (F, P, F/P)

Regulatory Criteria

☐ AT1
☐ CCME
☐ Drinking Water
☐ D50 (Drilling Waste)
☐ Saskatchewan
☐ Other:

Special Instructions

MW-36 Deep → not filtered or preserved

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Brent Schmidt	2017/06/06	1655	David Tidmen	20170606	1702	B744752

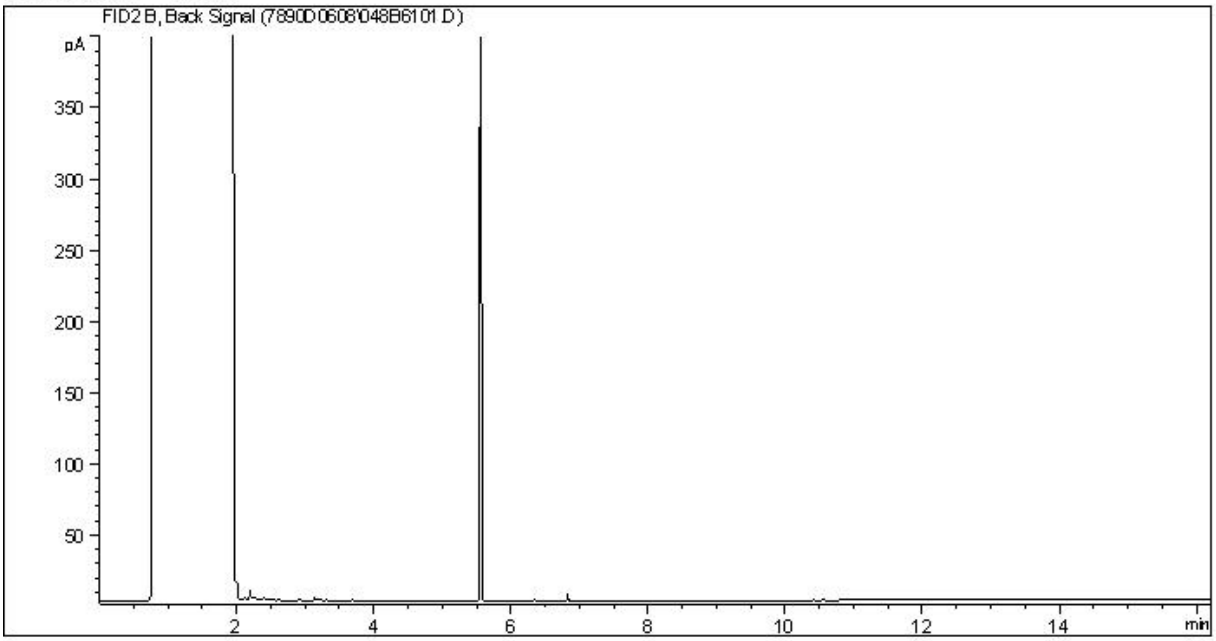
AB FCD-00331/7

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6344

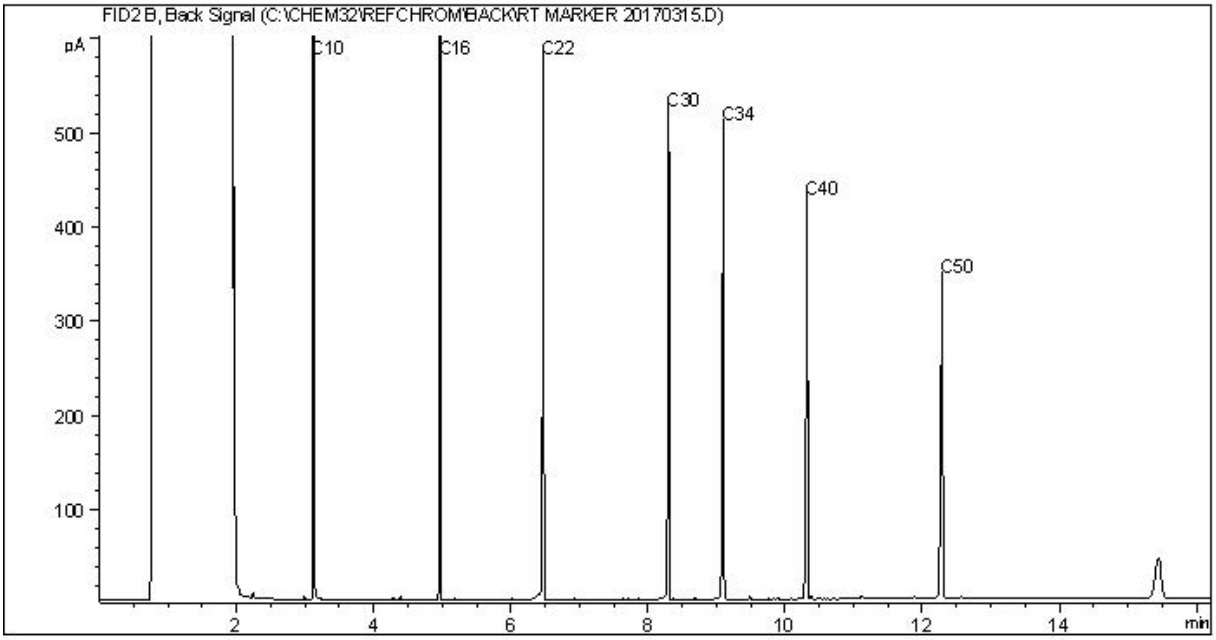
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-8A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

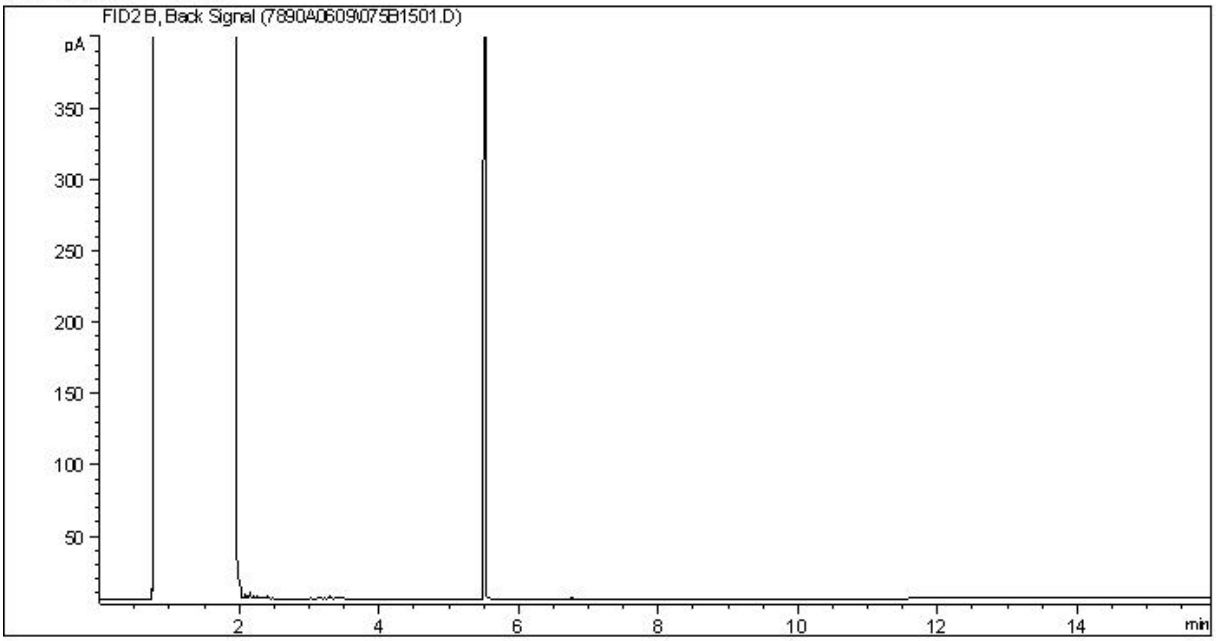
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6345

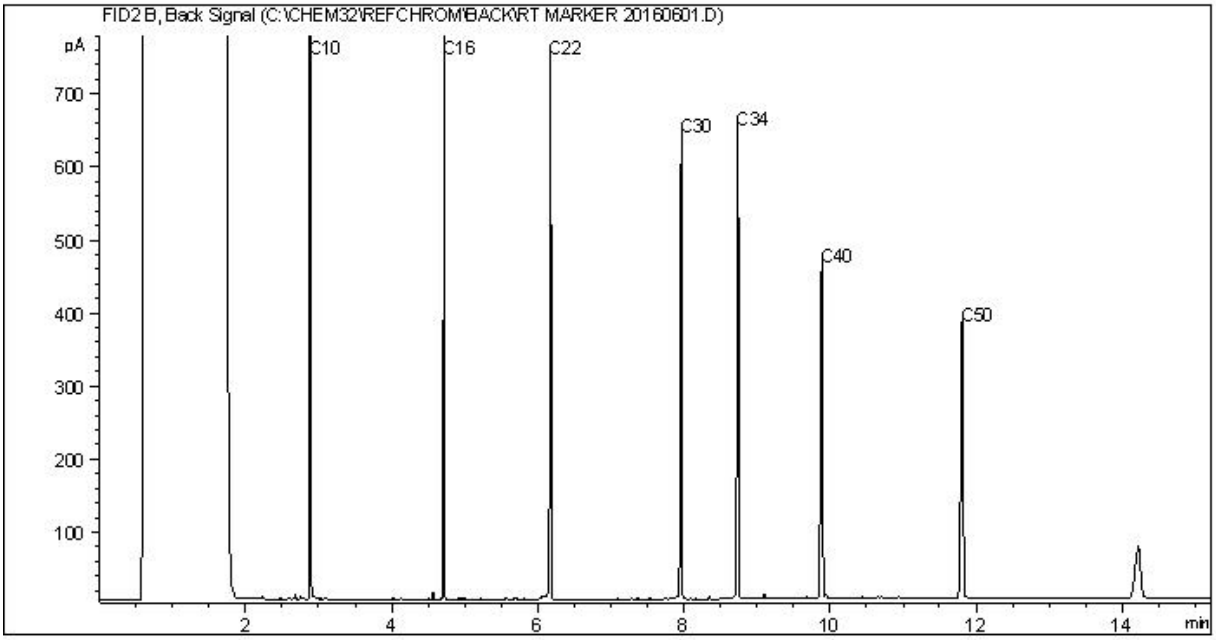
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-8B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

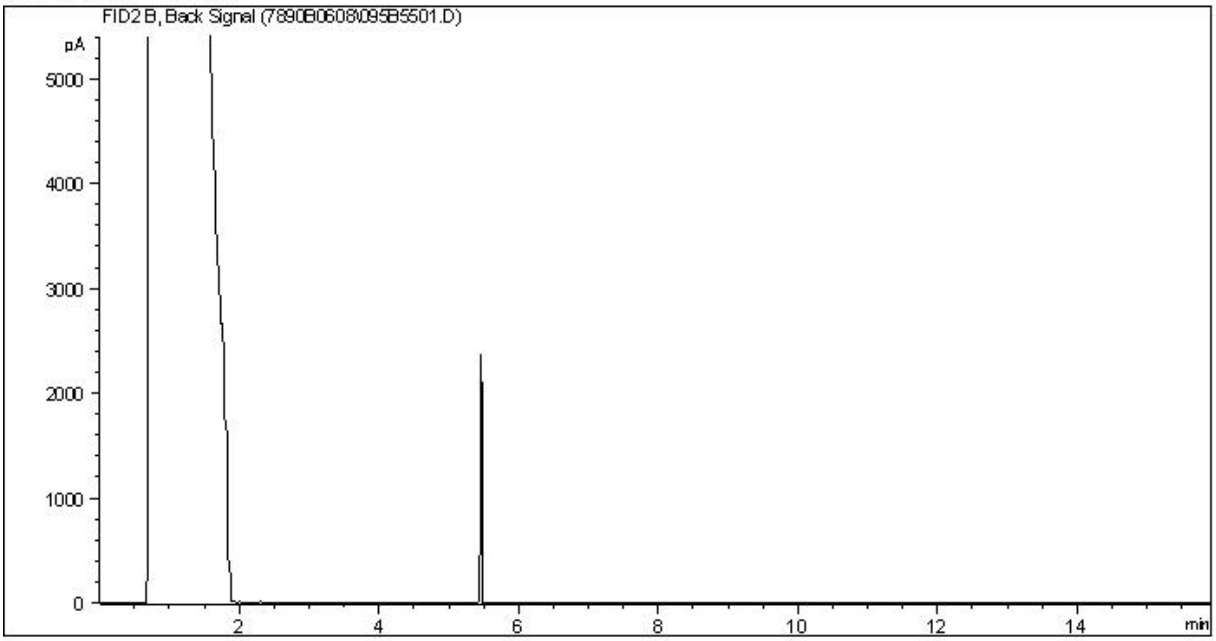
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6346

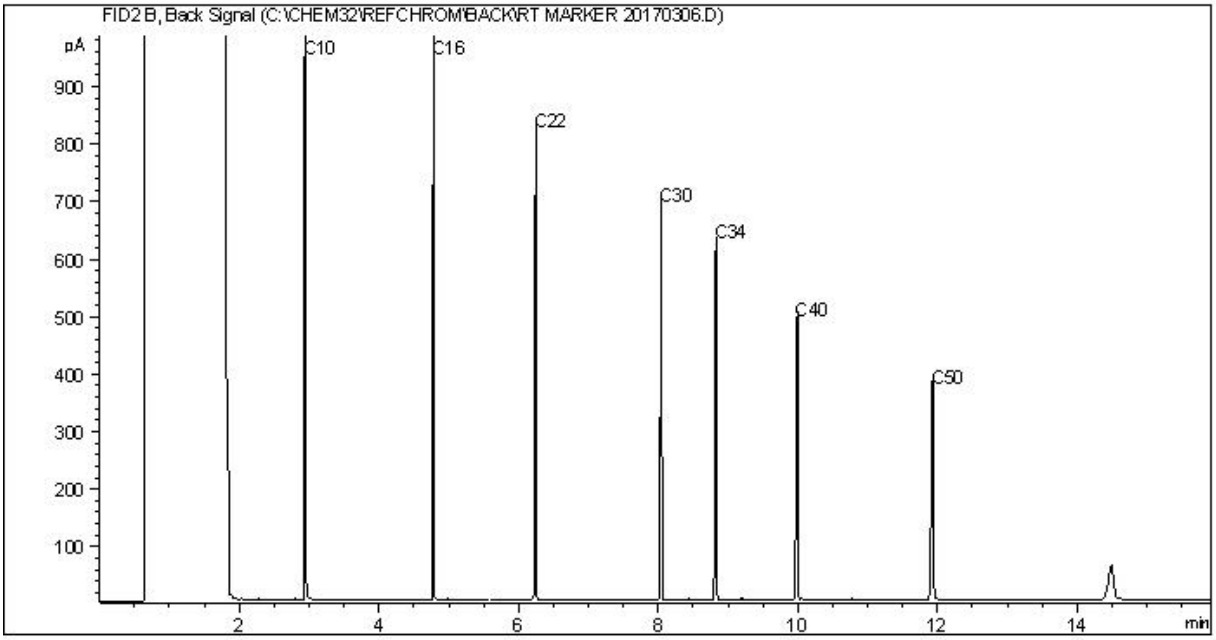
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-5A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

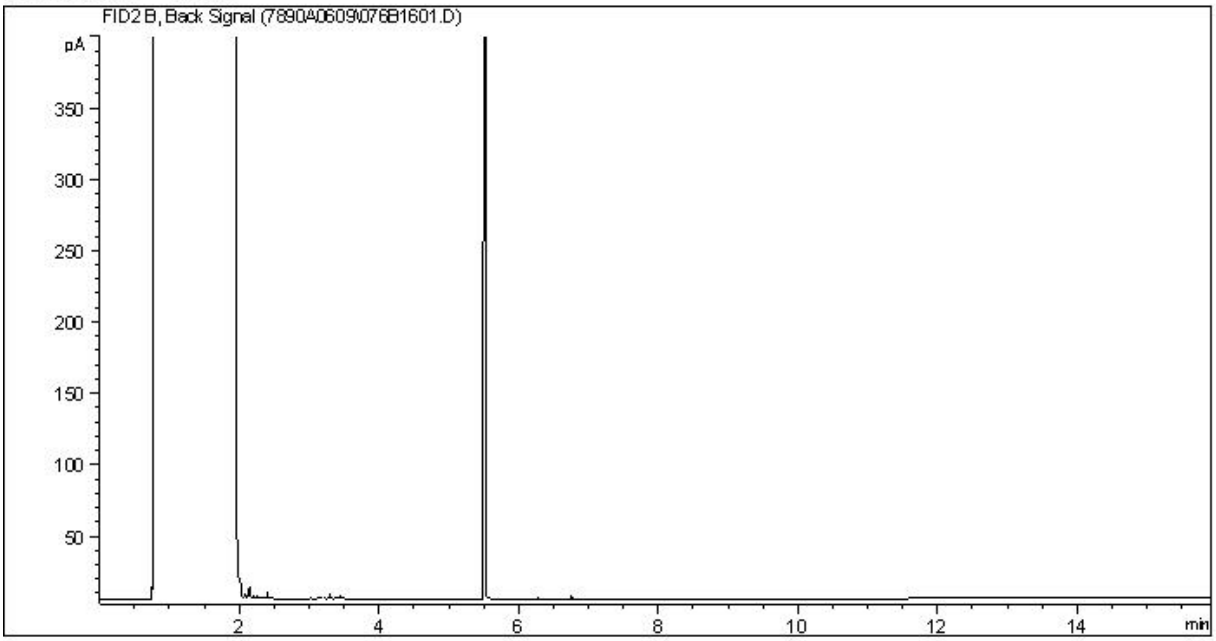
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6347

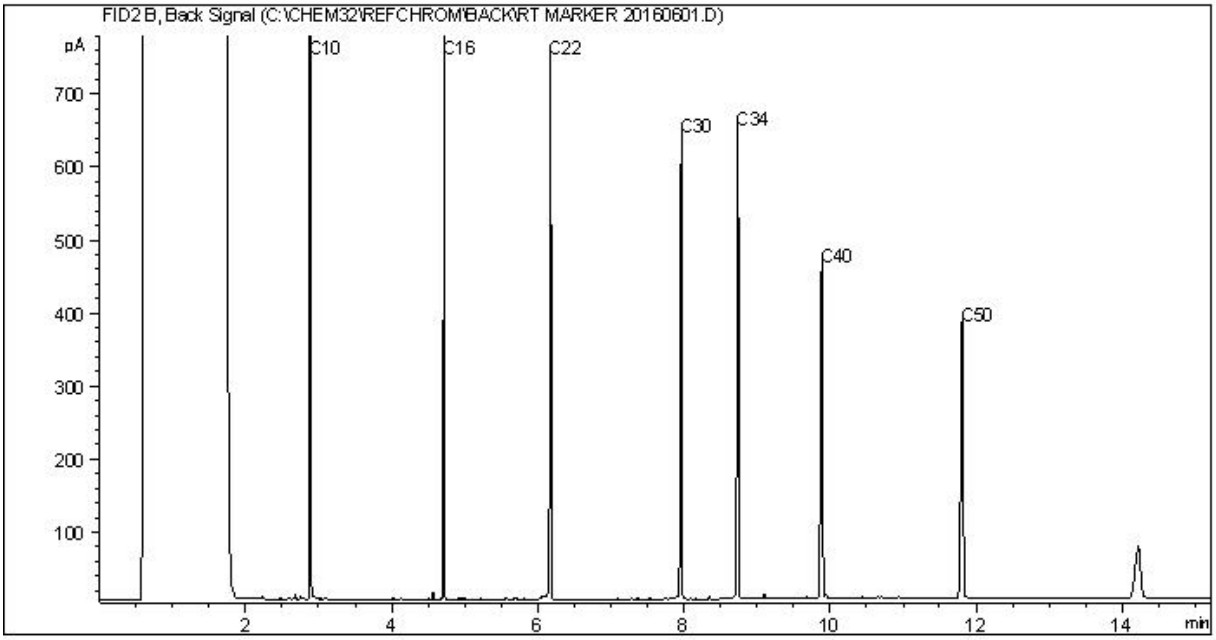
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-5B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

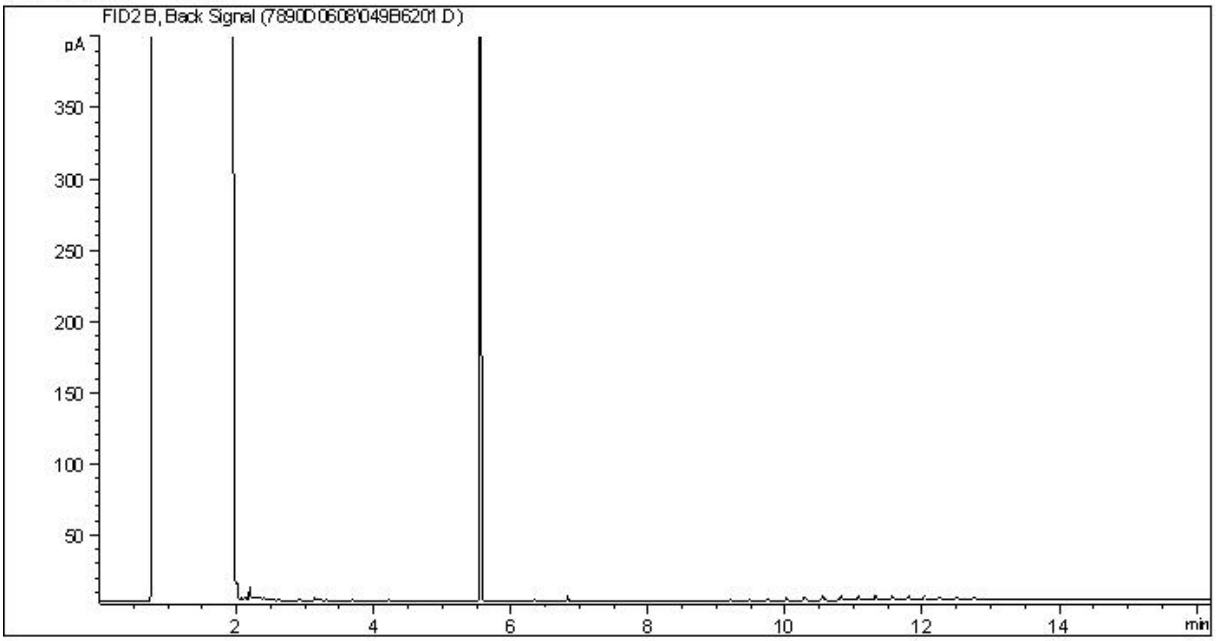
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6348

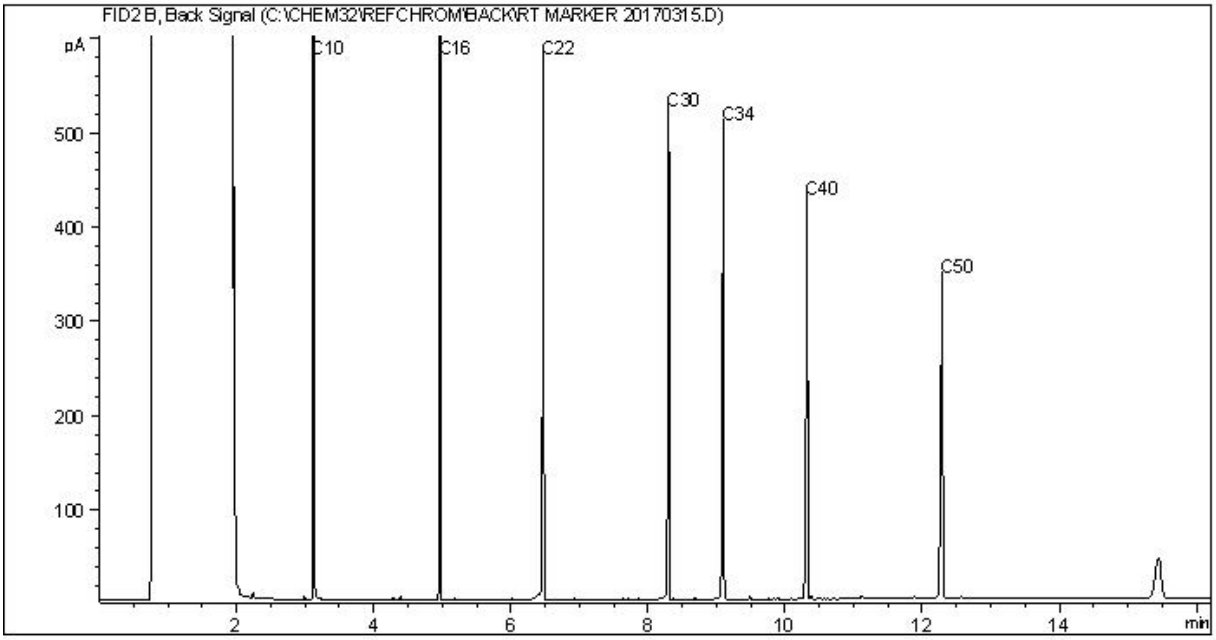
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-12A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

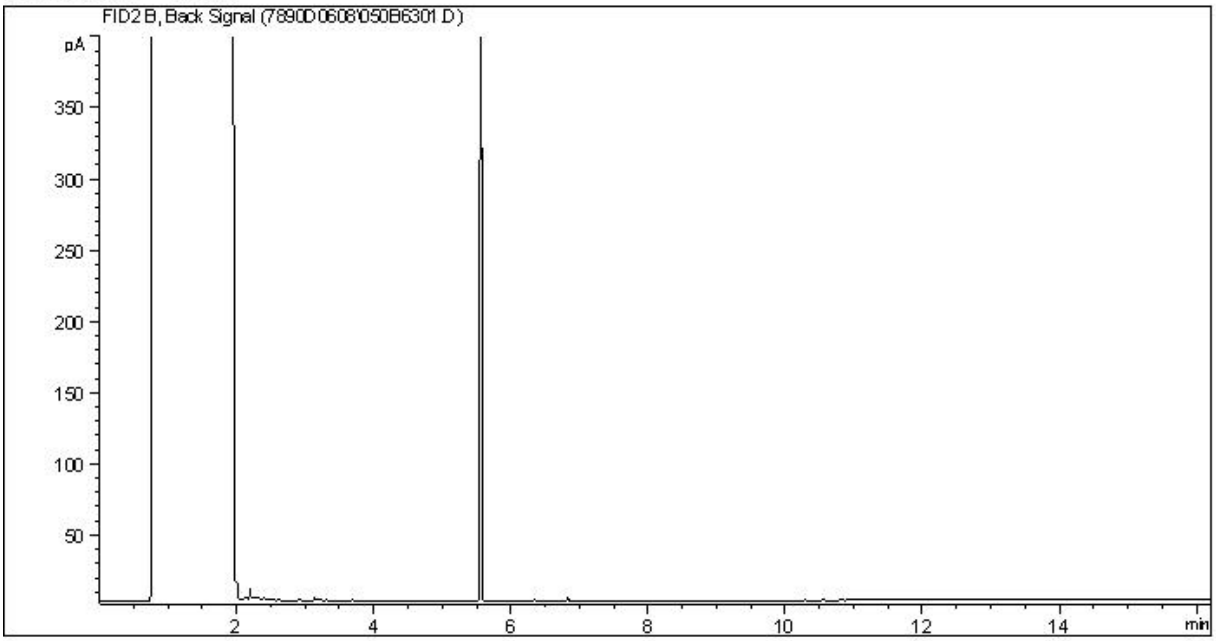
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6349

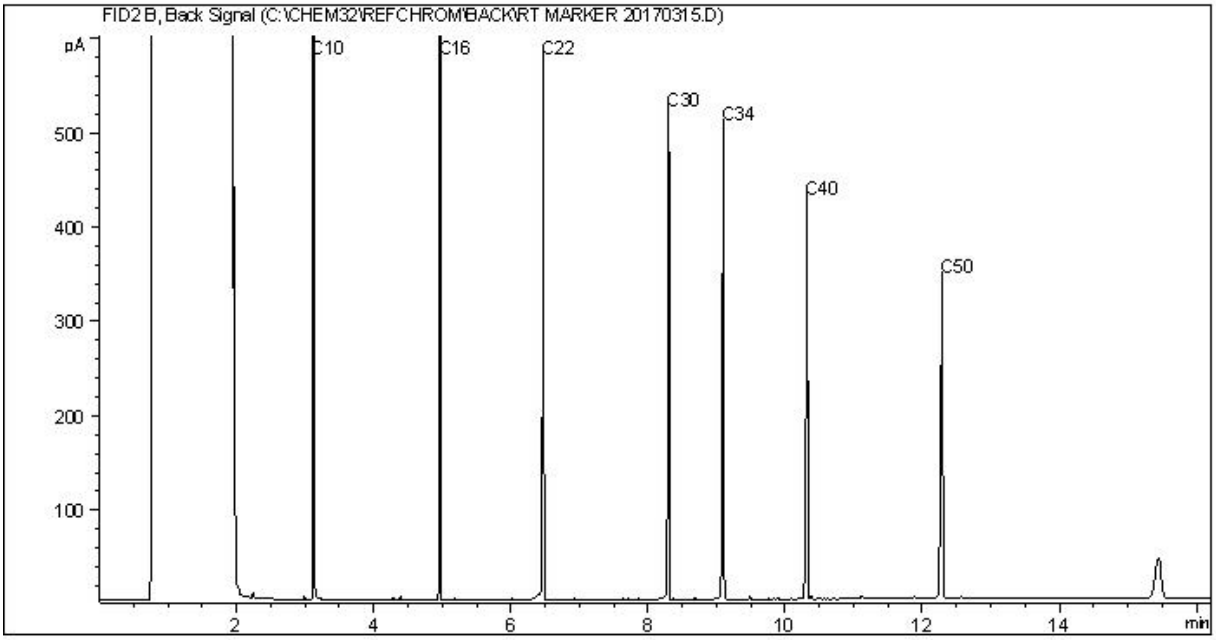
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-12B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

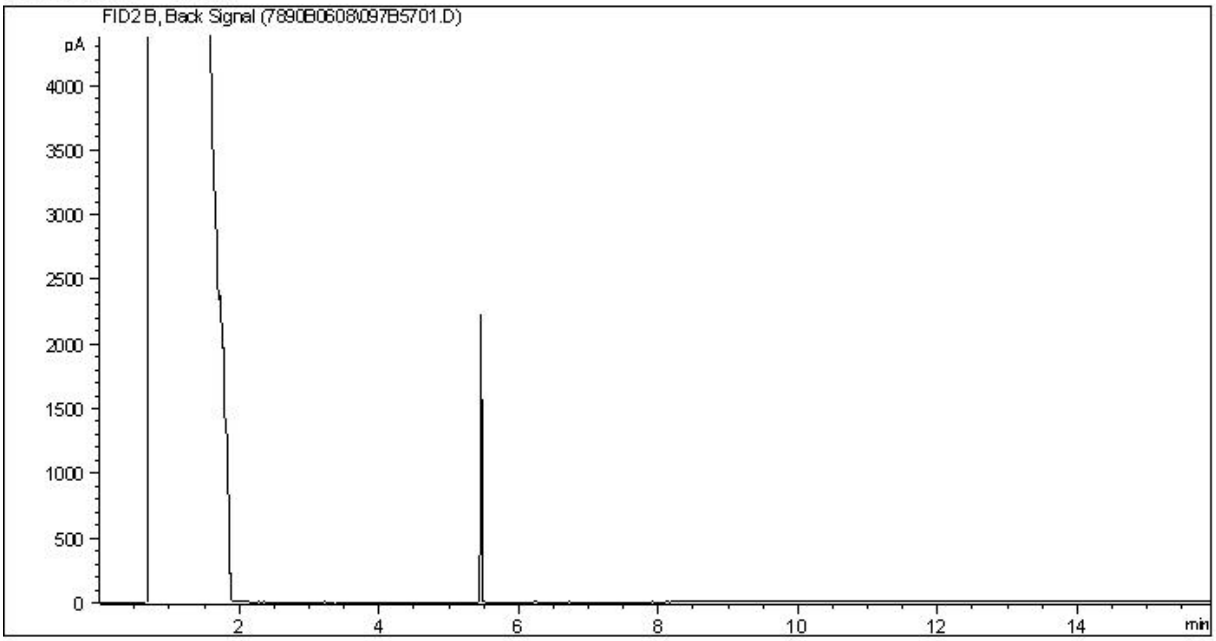
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6350

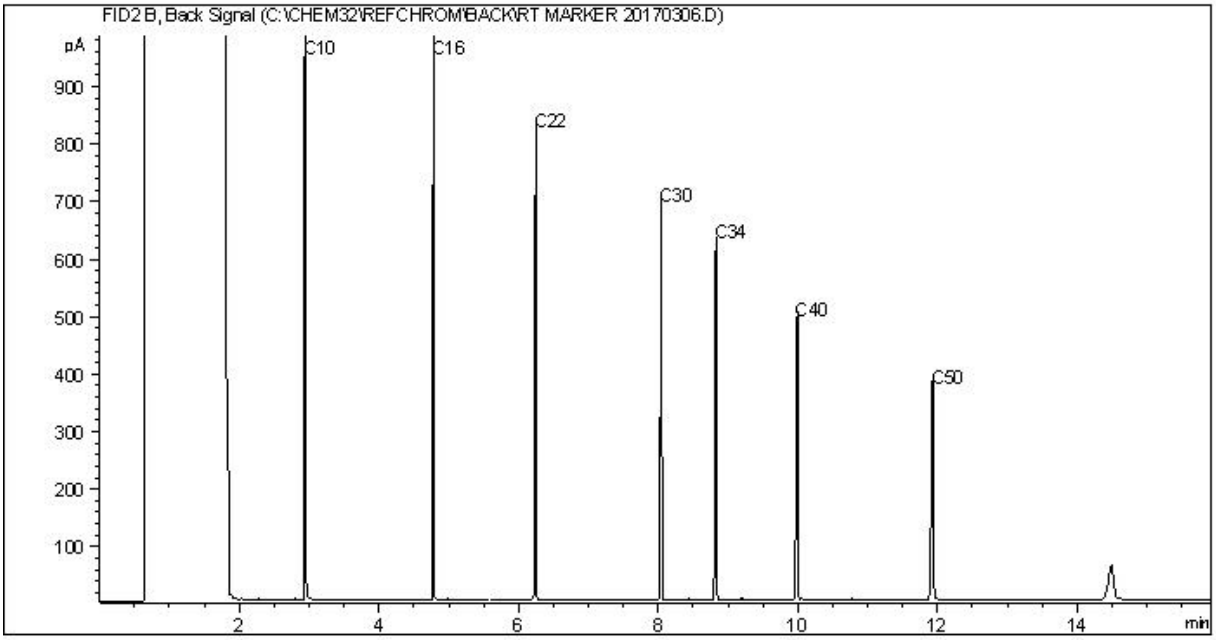
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-24A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



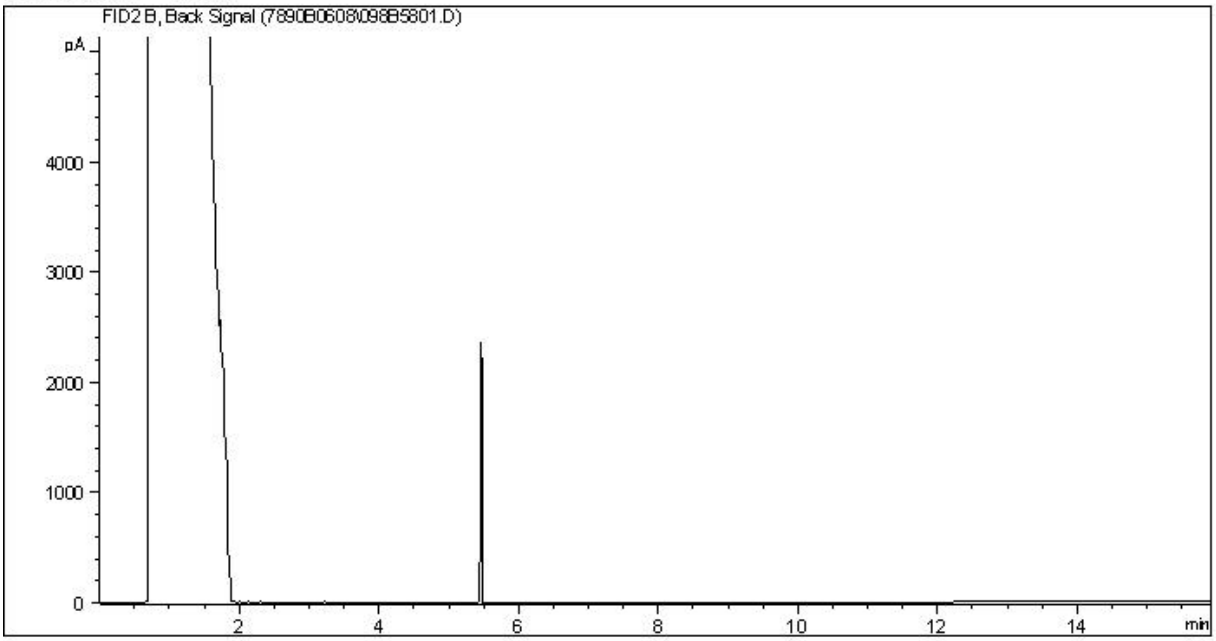
TYPICAL PRODUCT CARBON NUMBER RANGES

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

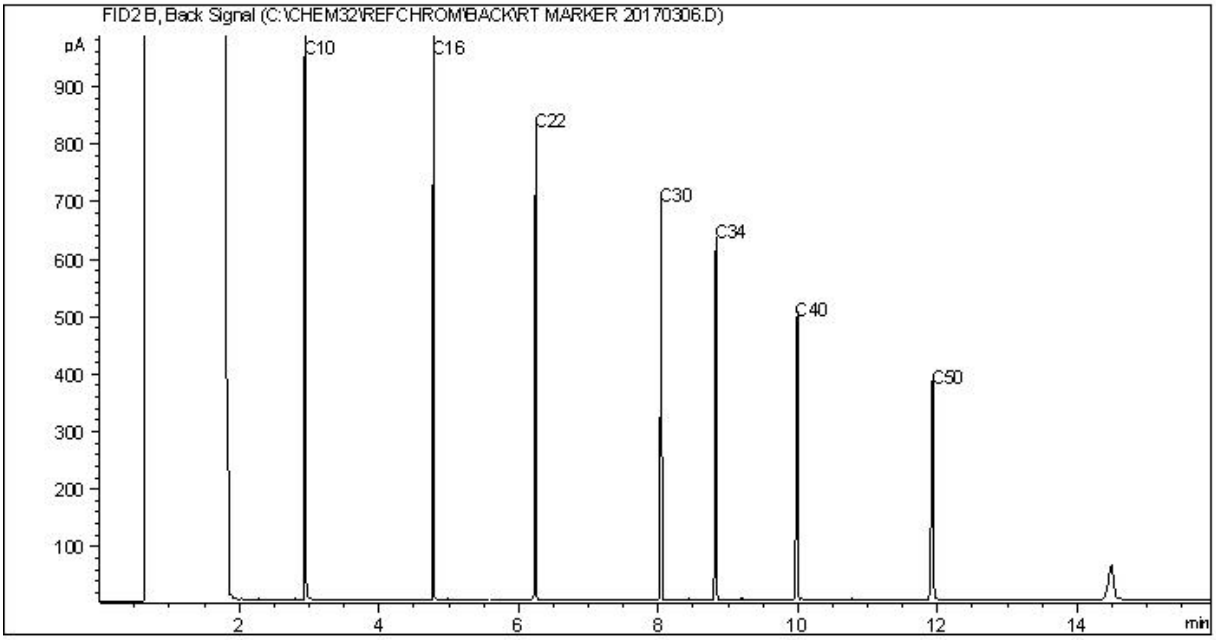
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



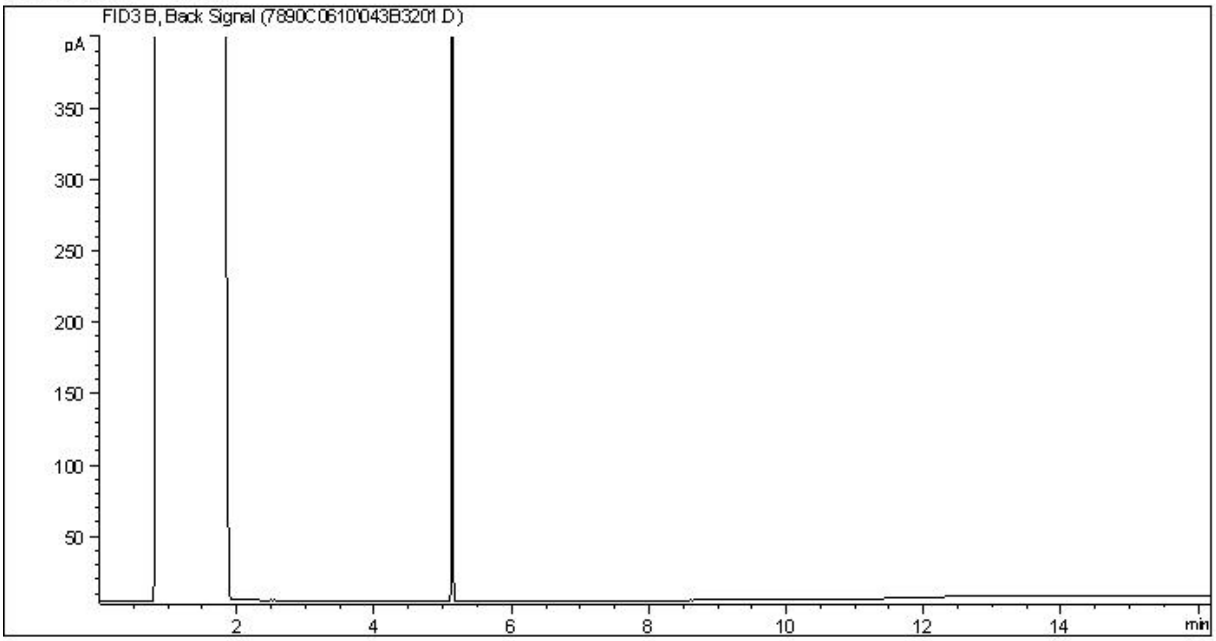
TYPICAL PRODUCT CARBON NUMBER RANGES

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

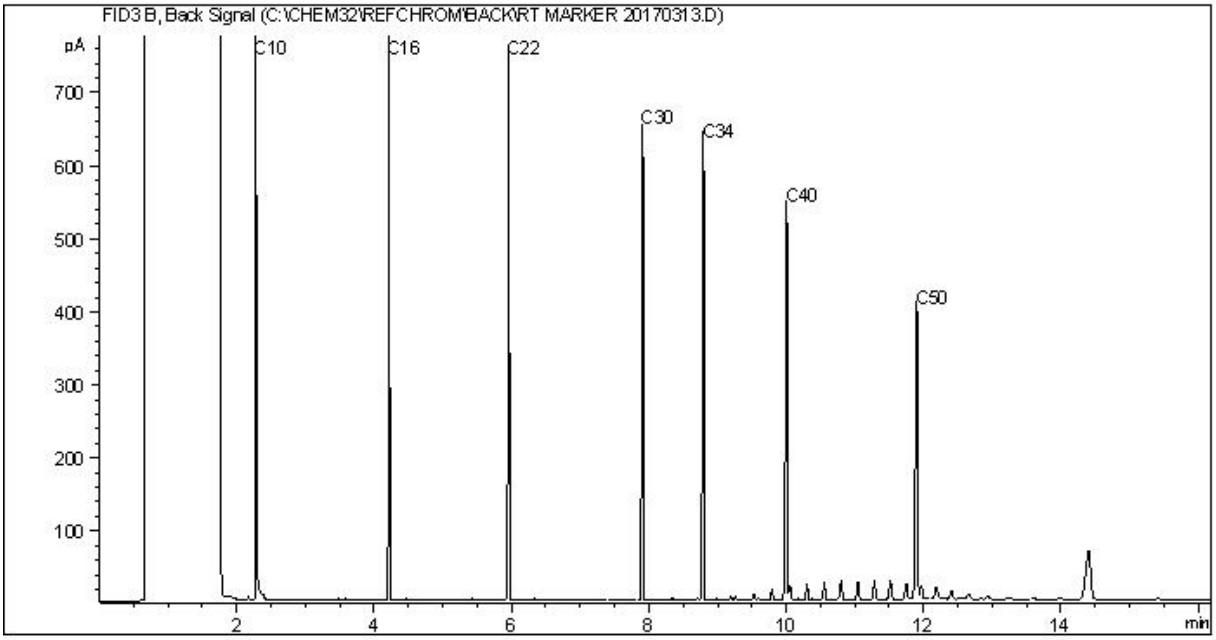
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

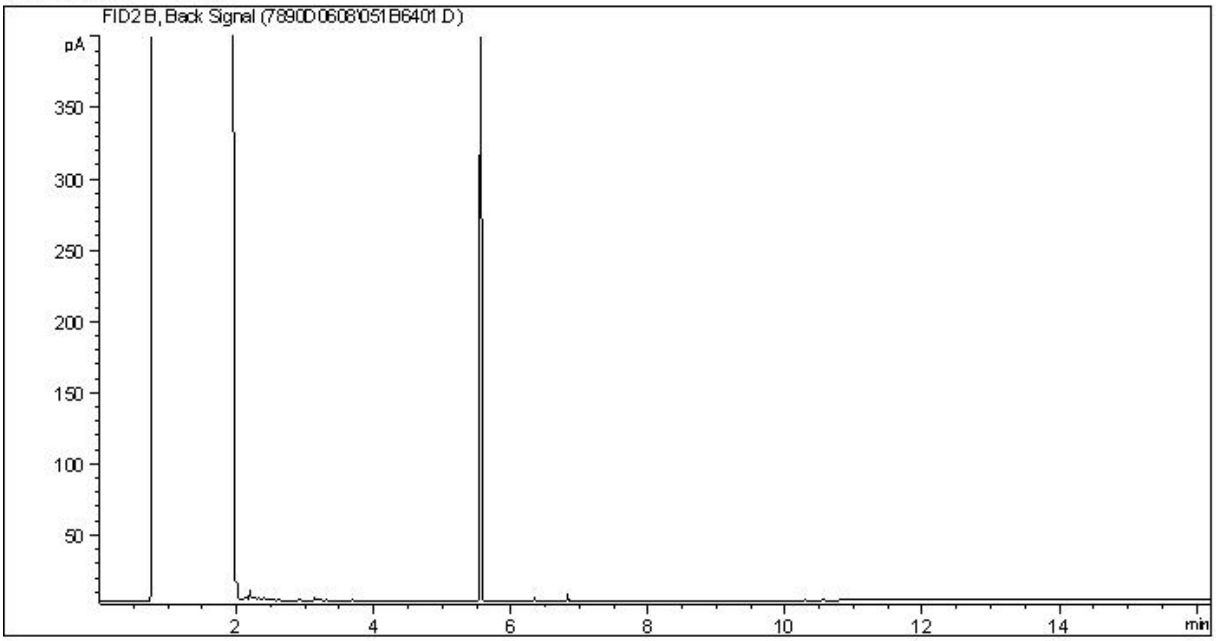
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6353

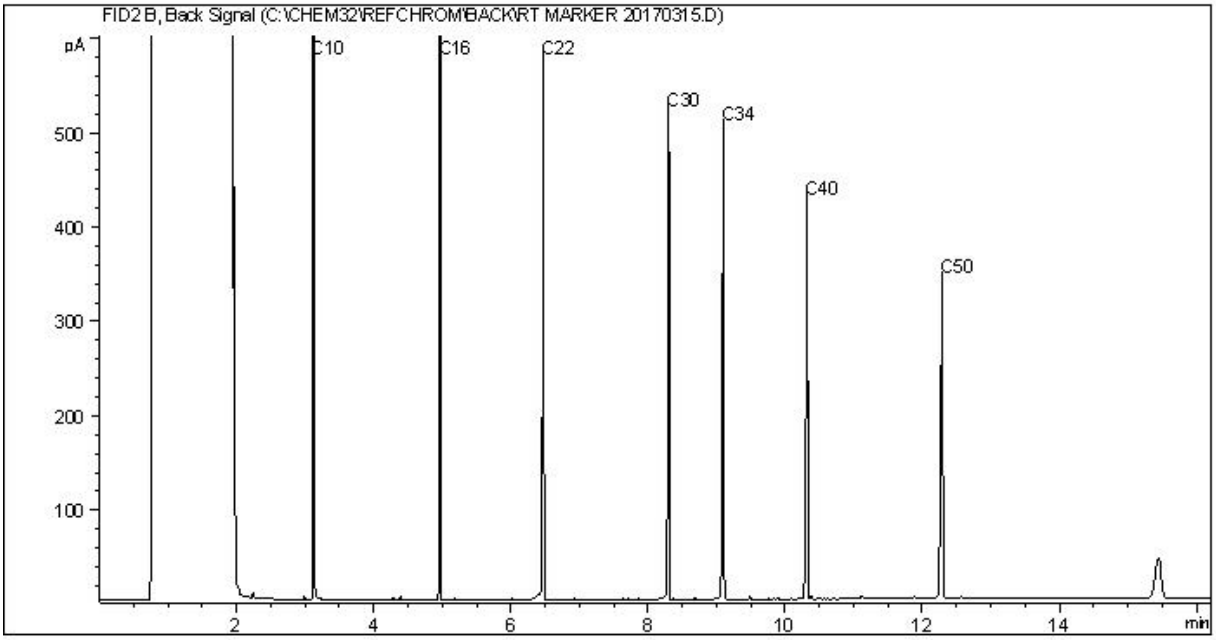
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-20A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



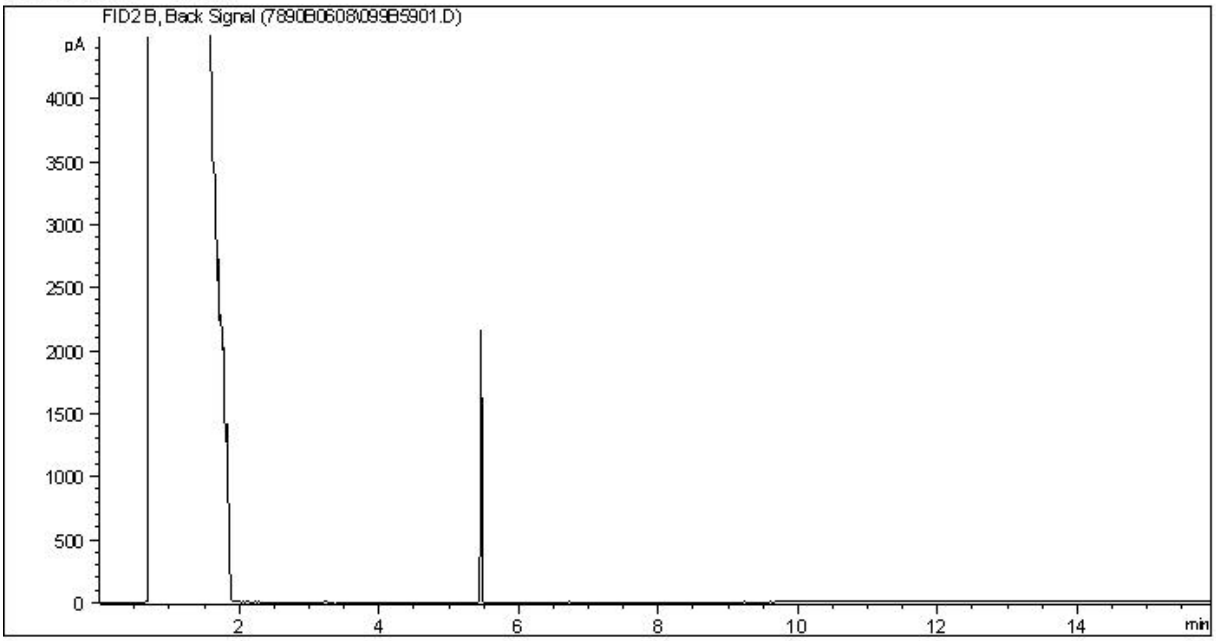
TYPICAL PRODUCT CARBON NUMBER RANGES

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

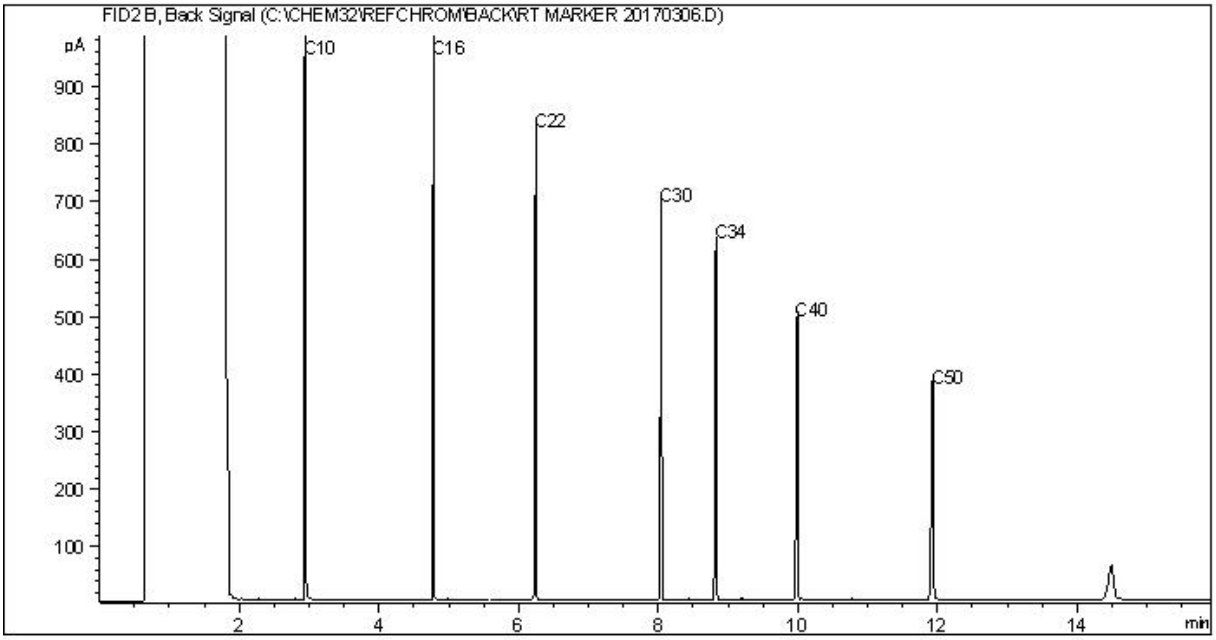
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

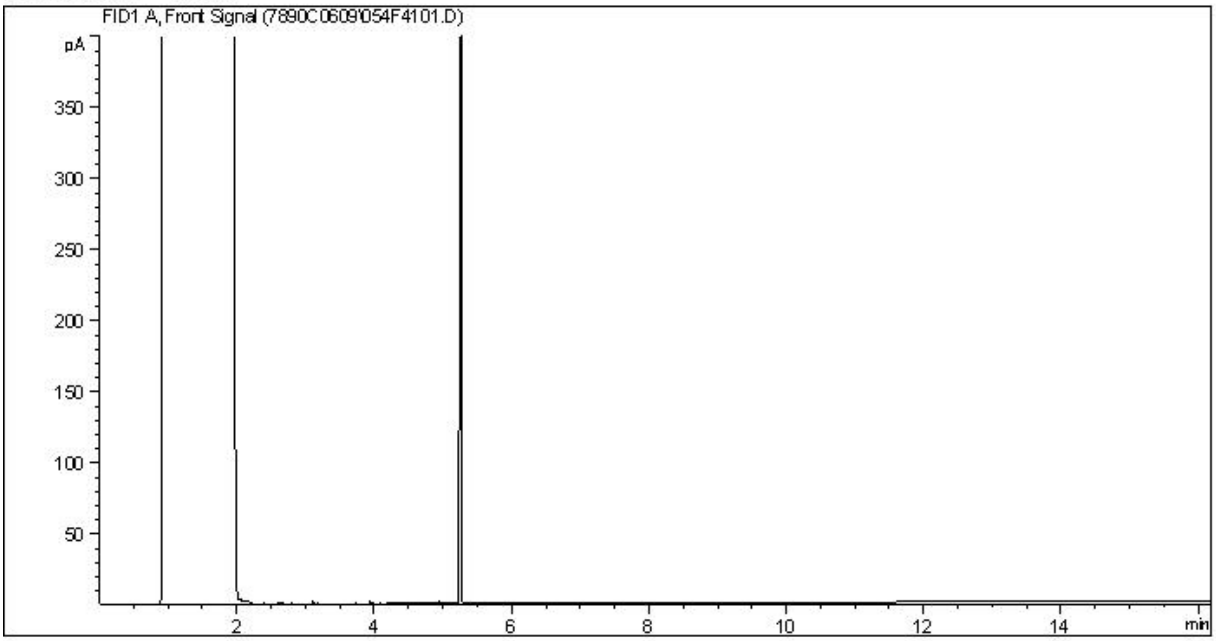
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6390

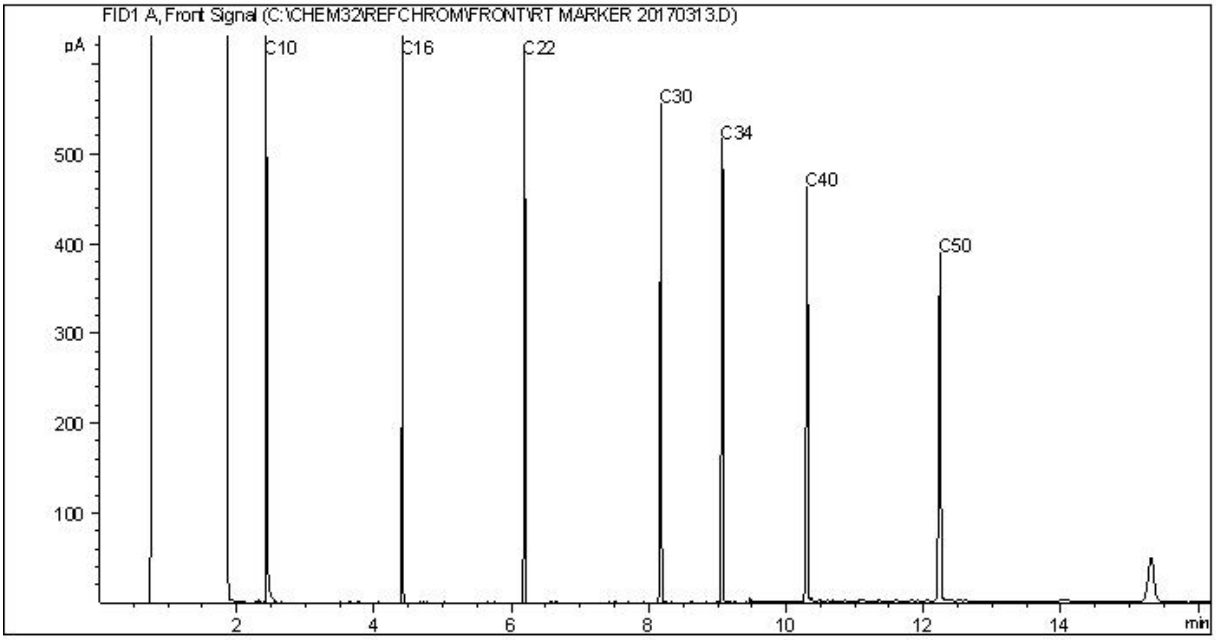
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-25A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



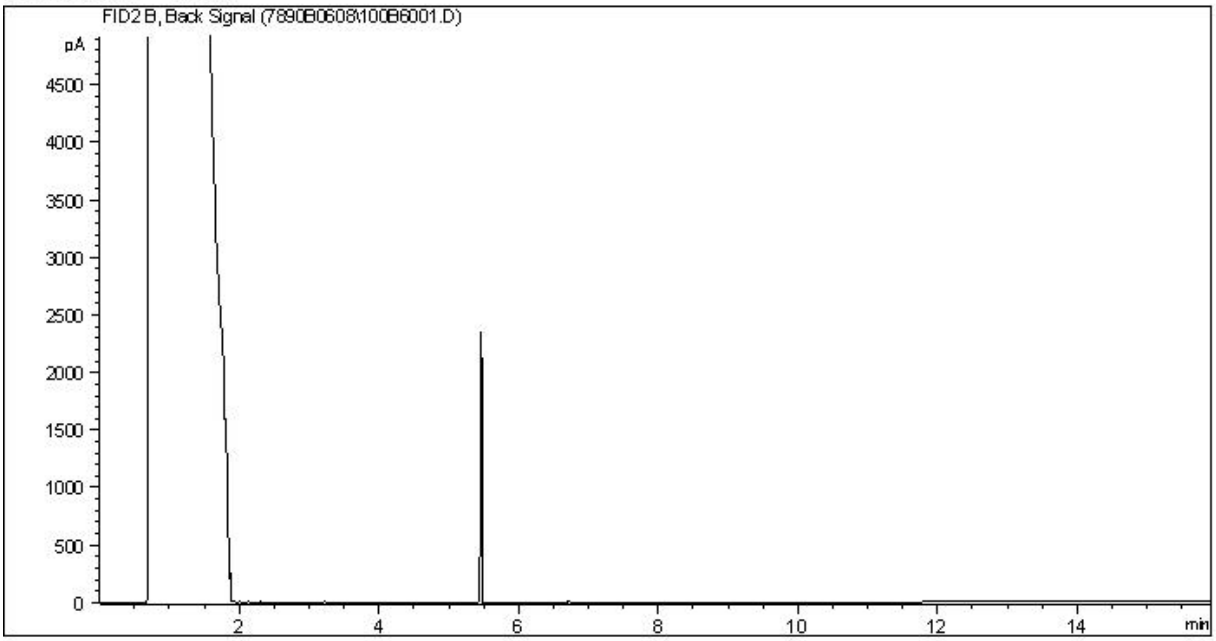
TYPICAL PRODUCT CARBON NUMBER RANGES

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

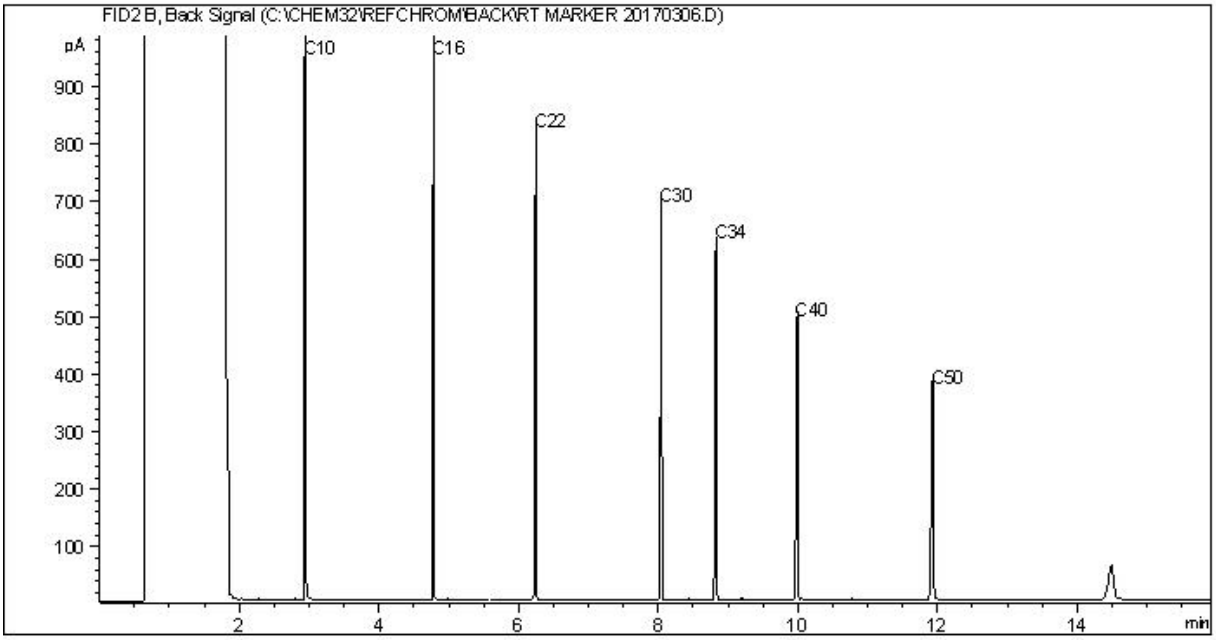
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

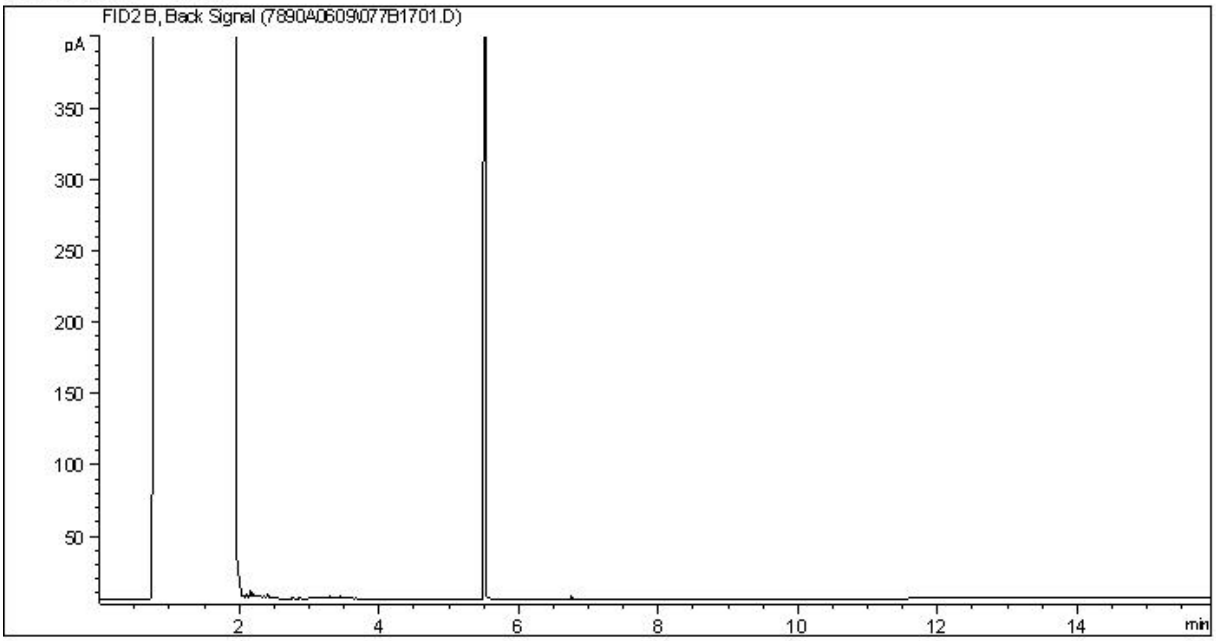
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6392

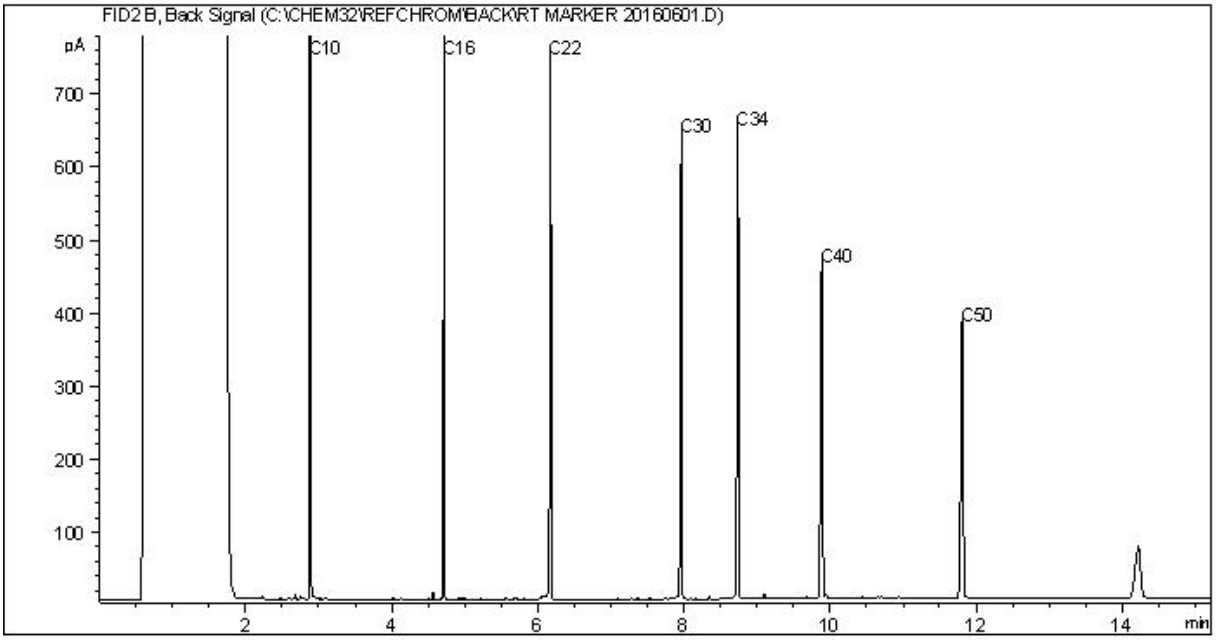
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-31A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
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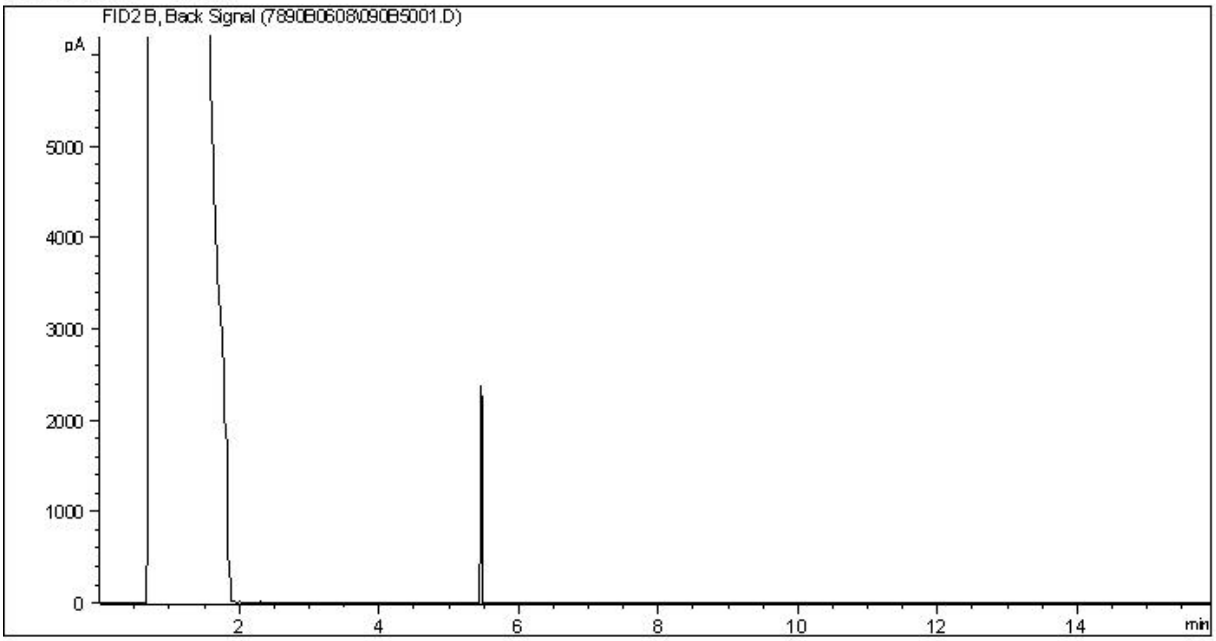
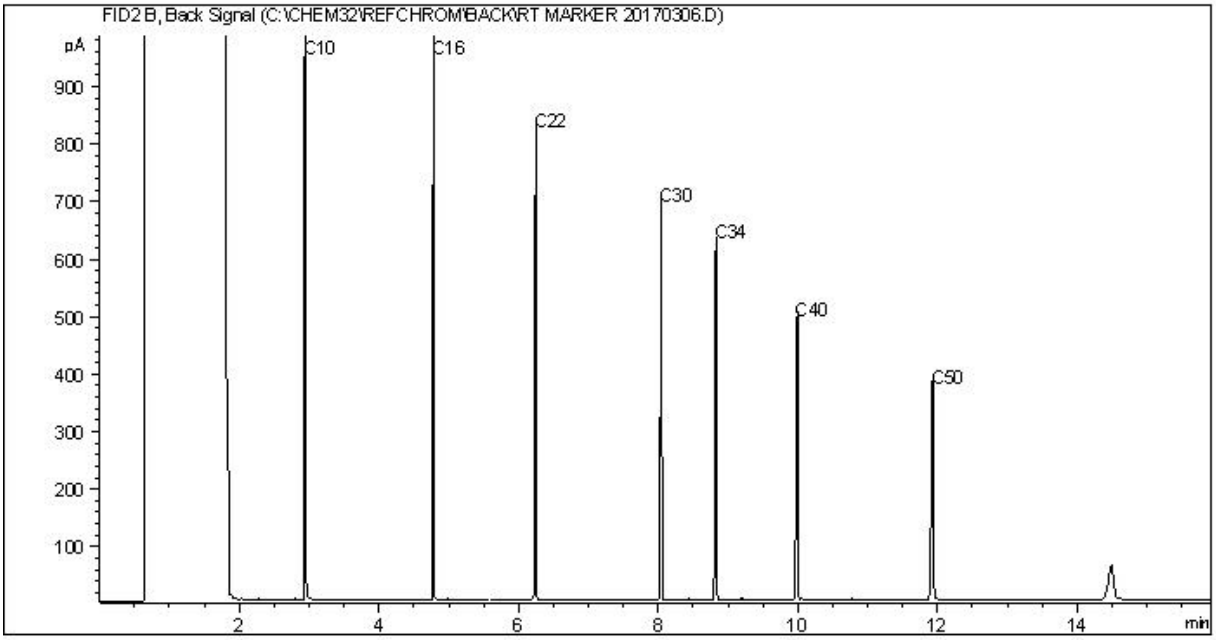
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
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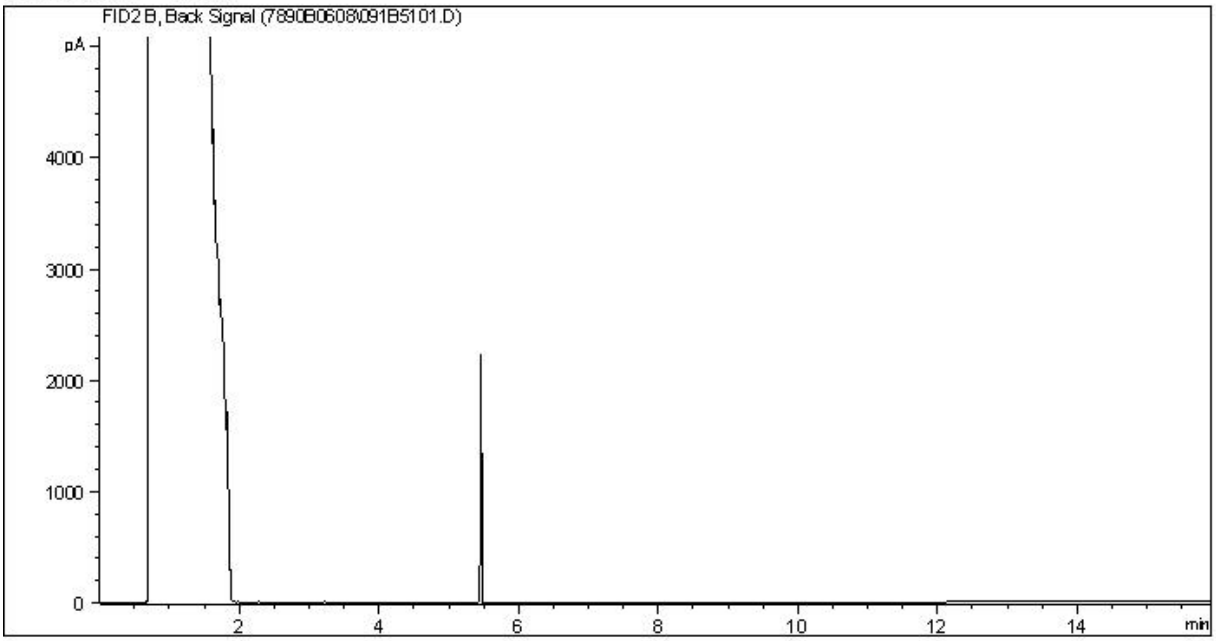
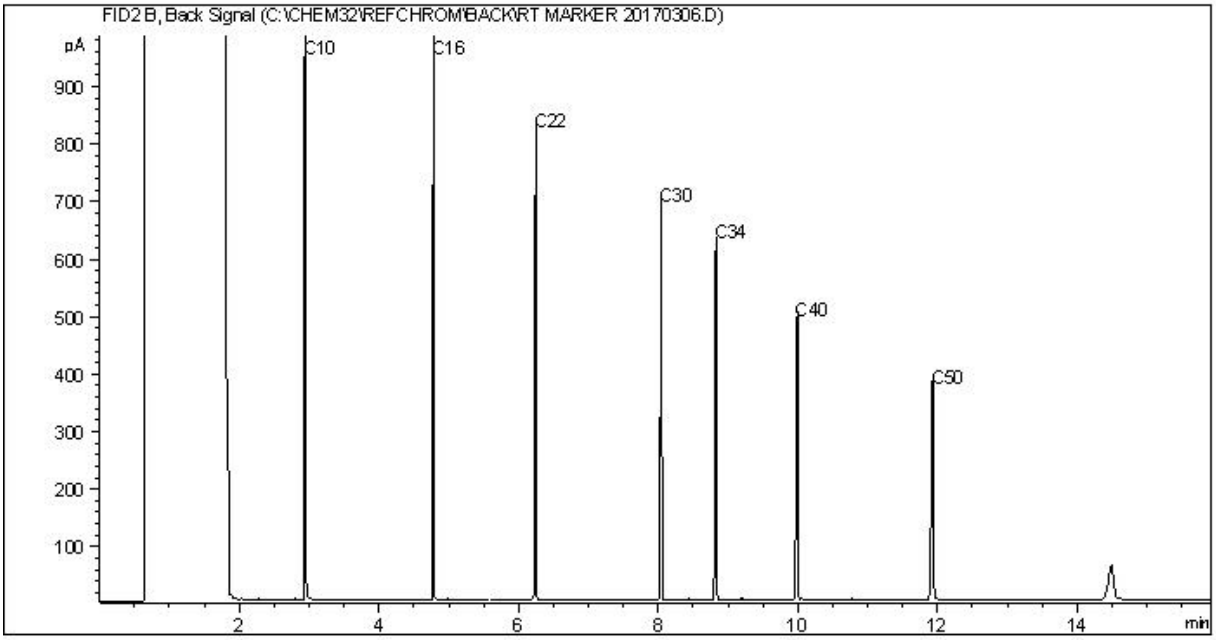
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

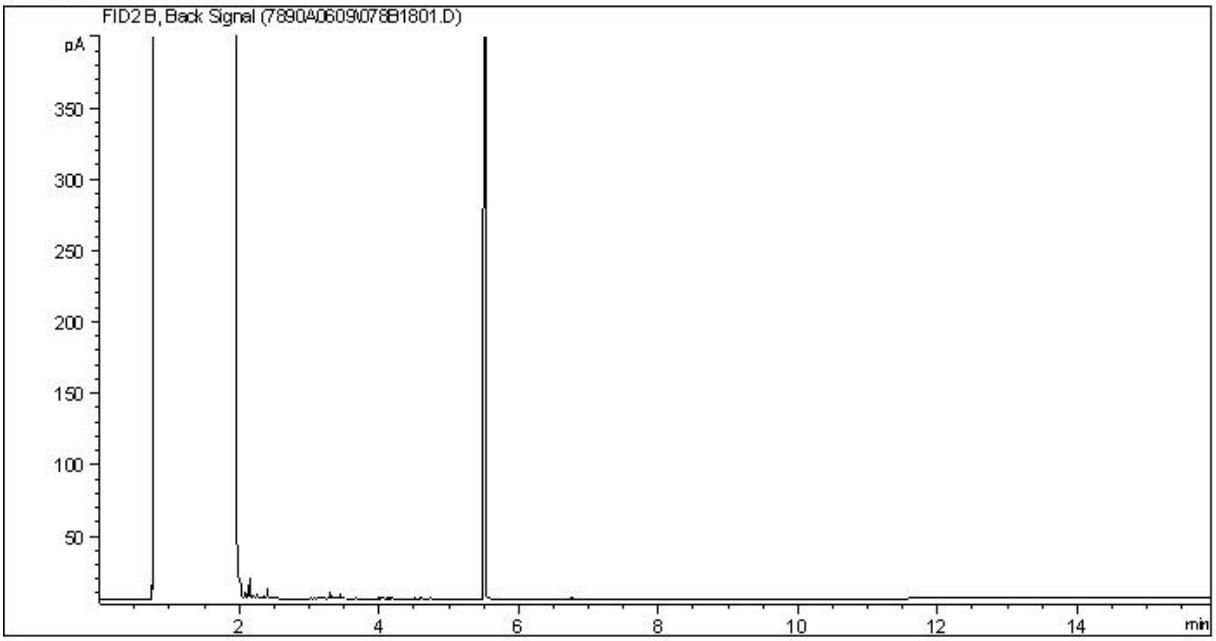
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6394

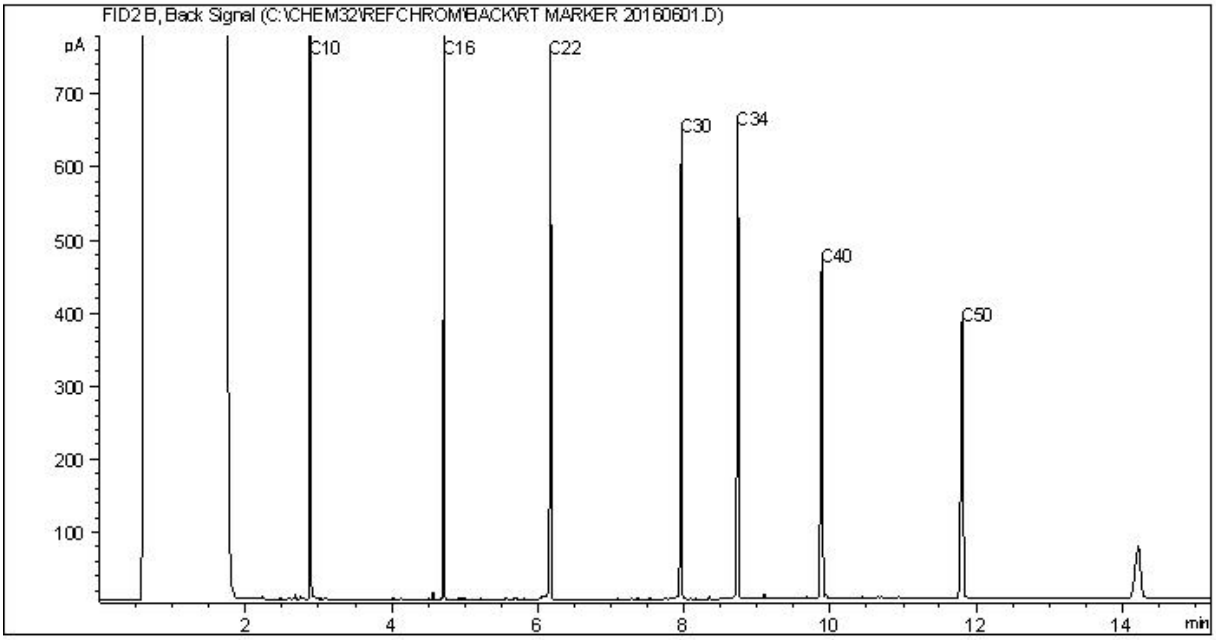
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-33B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

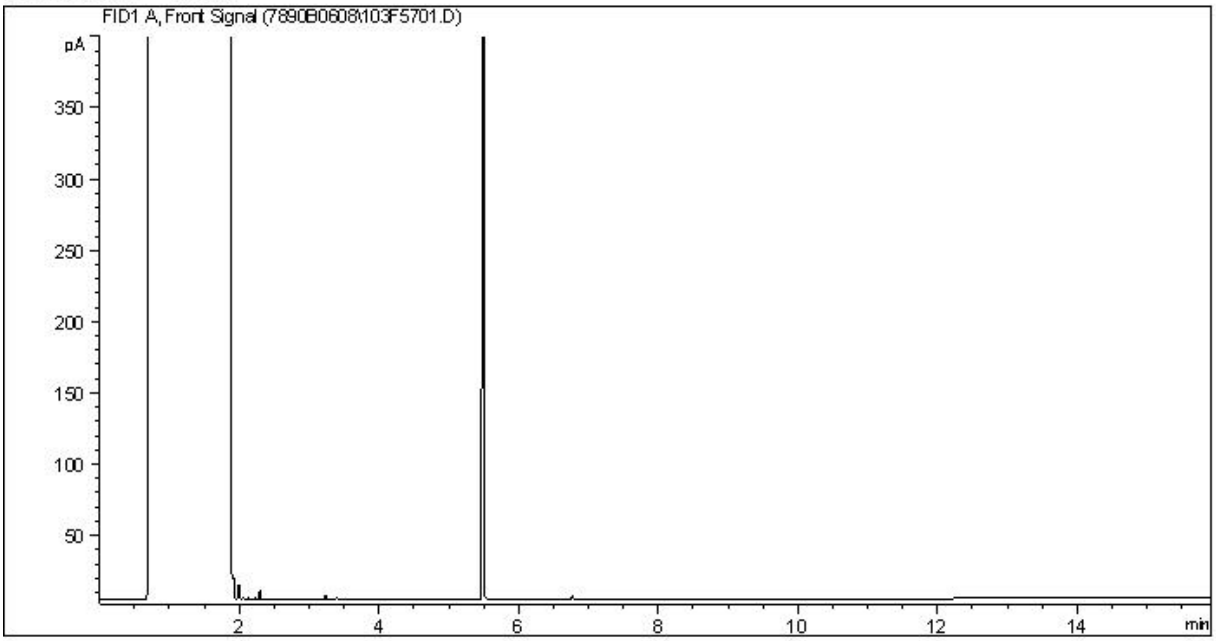
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6395

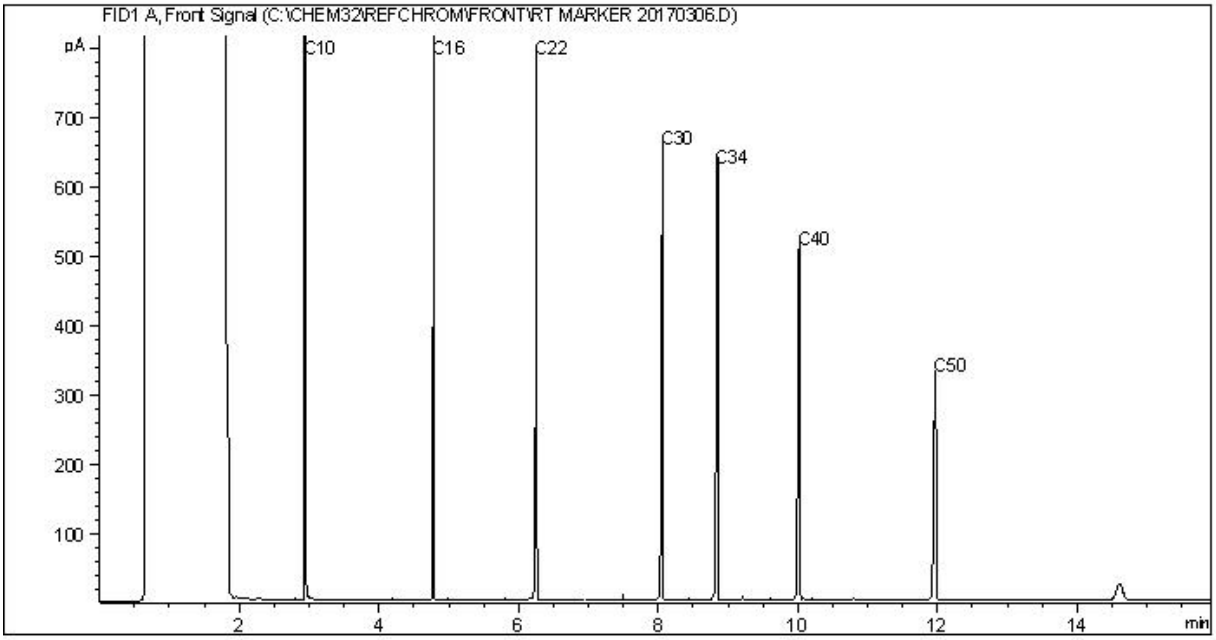
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-34A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

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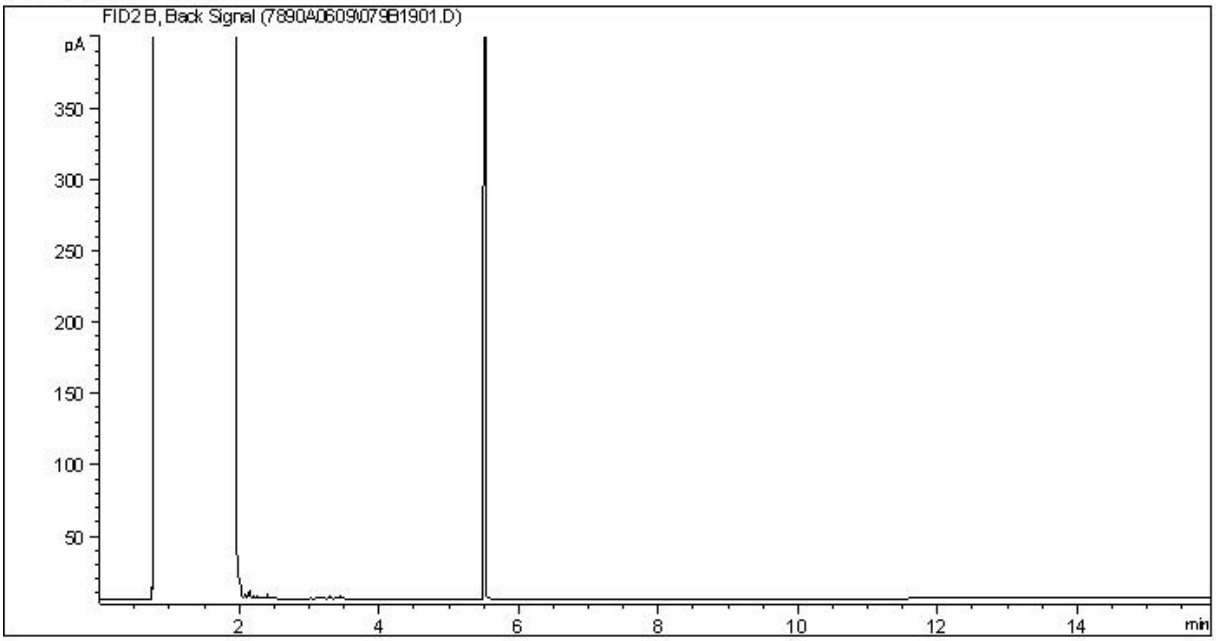
Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6396

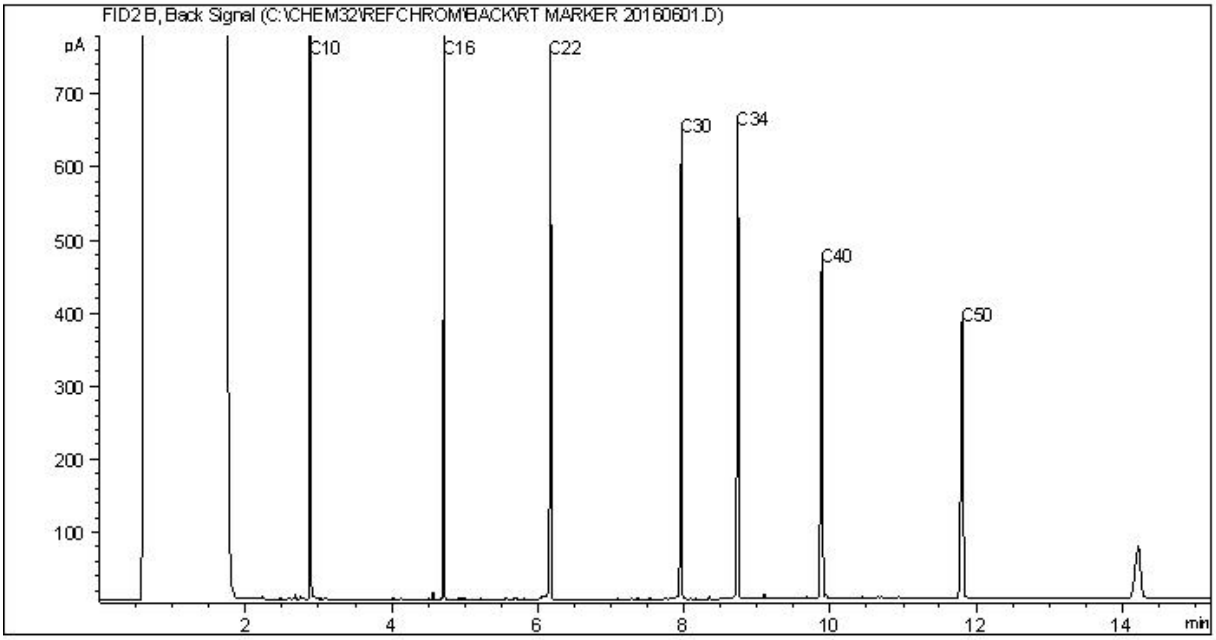
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-34B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



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Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
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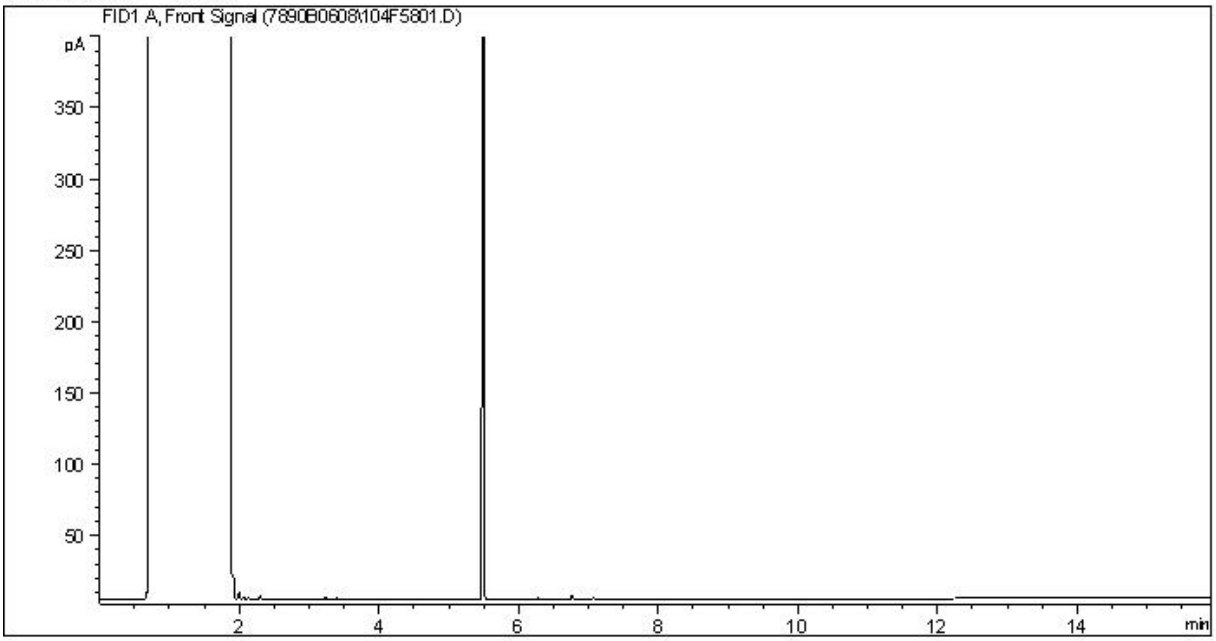
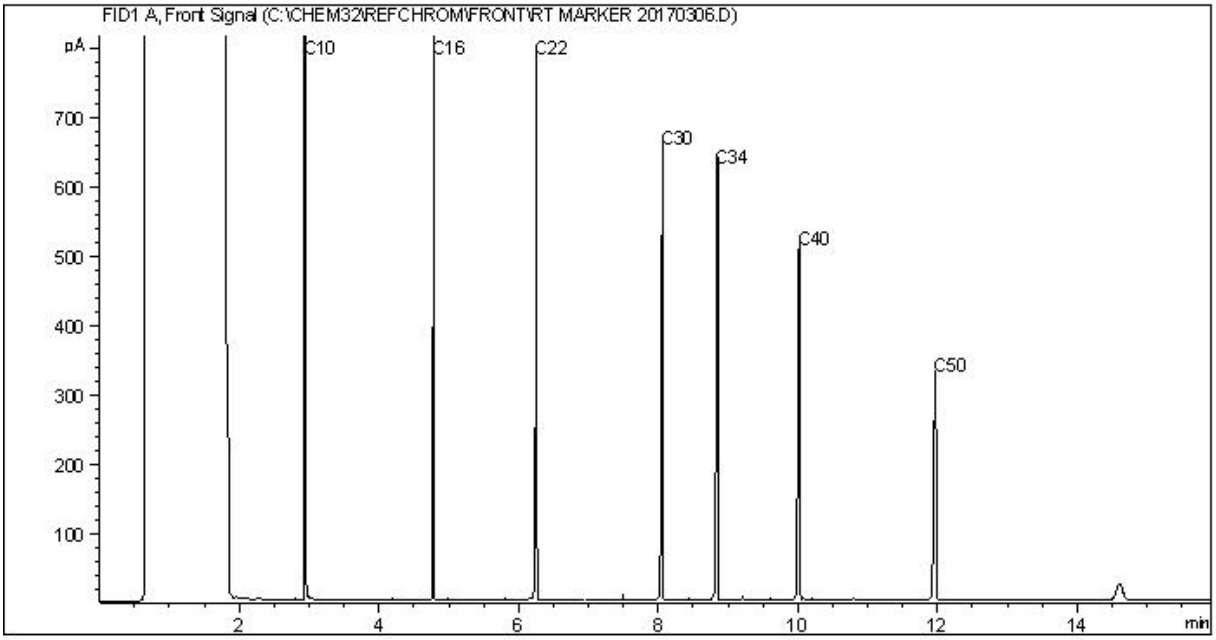
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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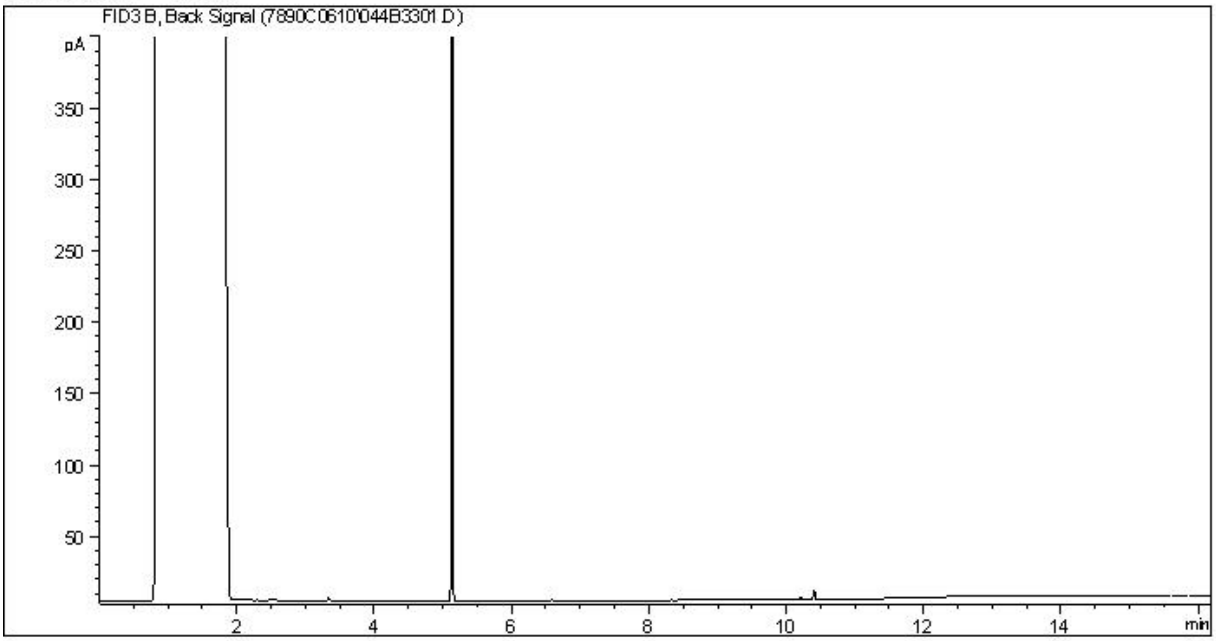
Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6398

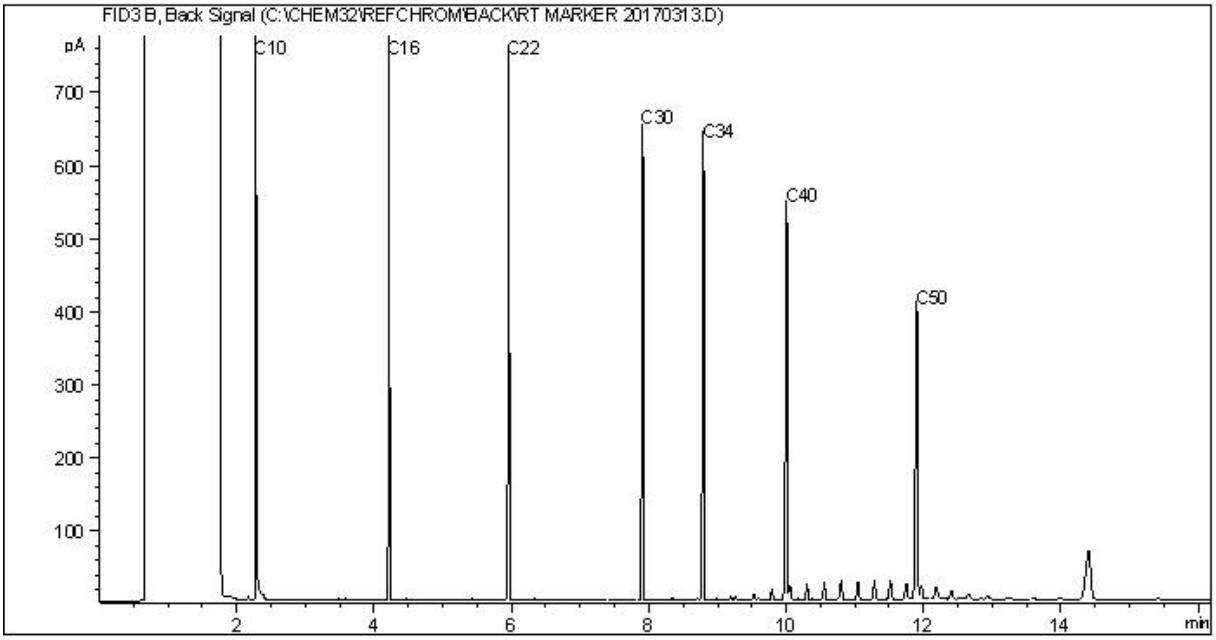
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-35A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



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Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
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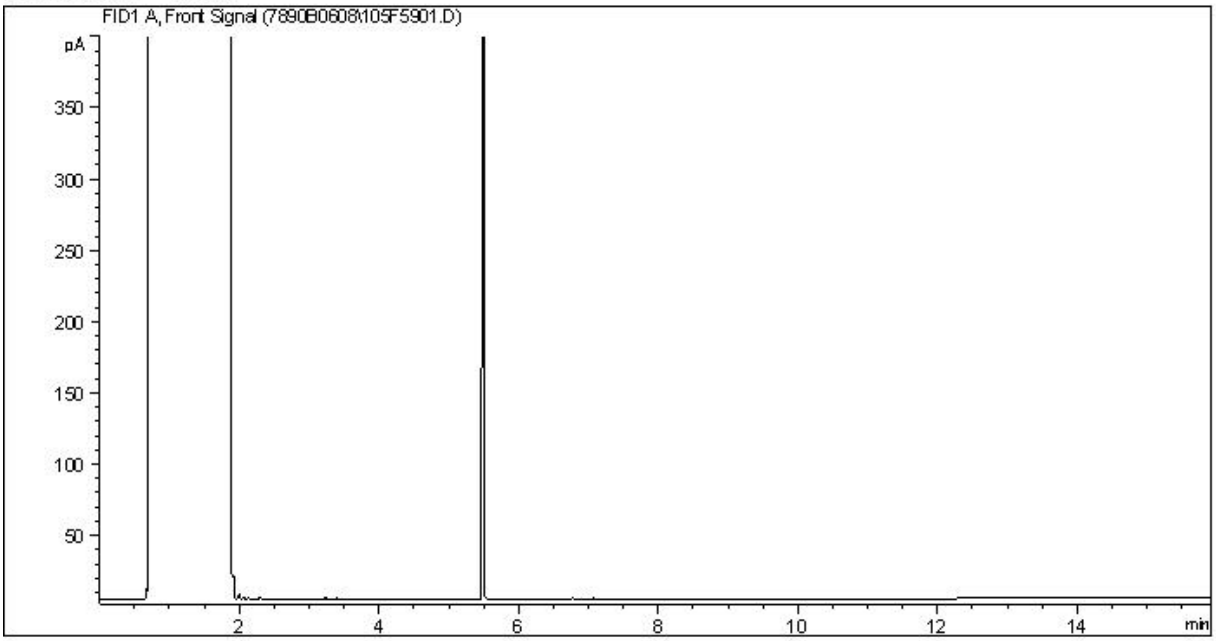
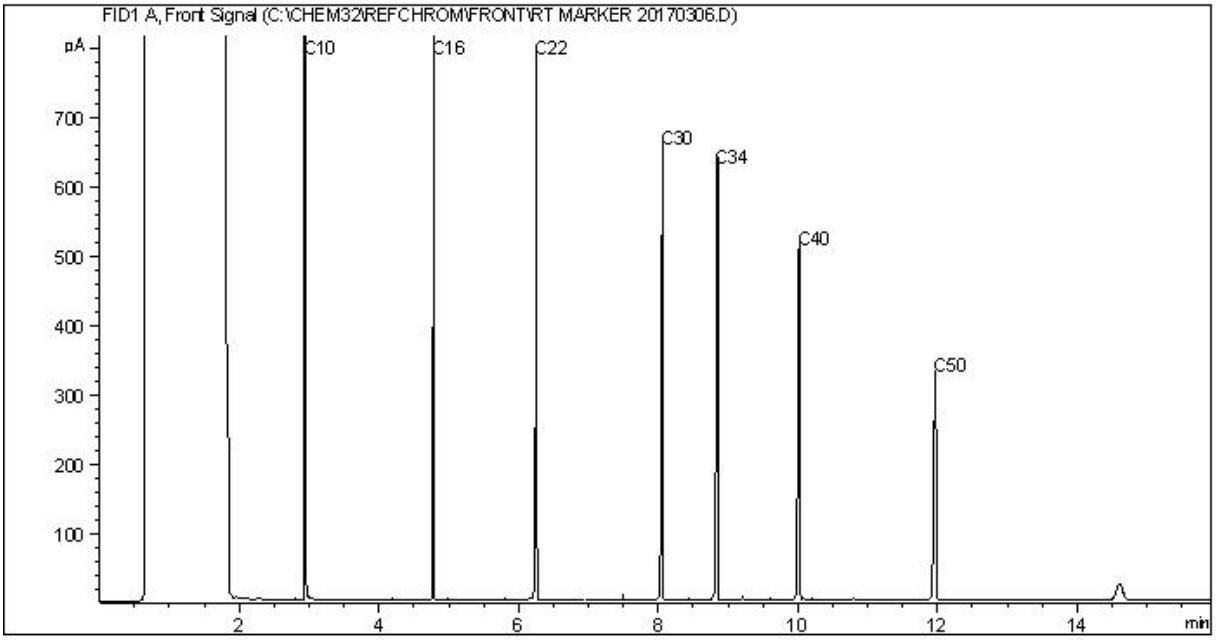
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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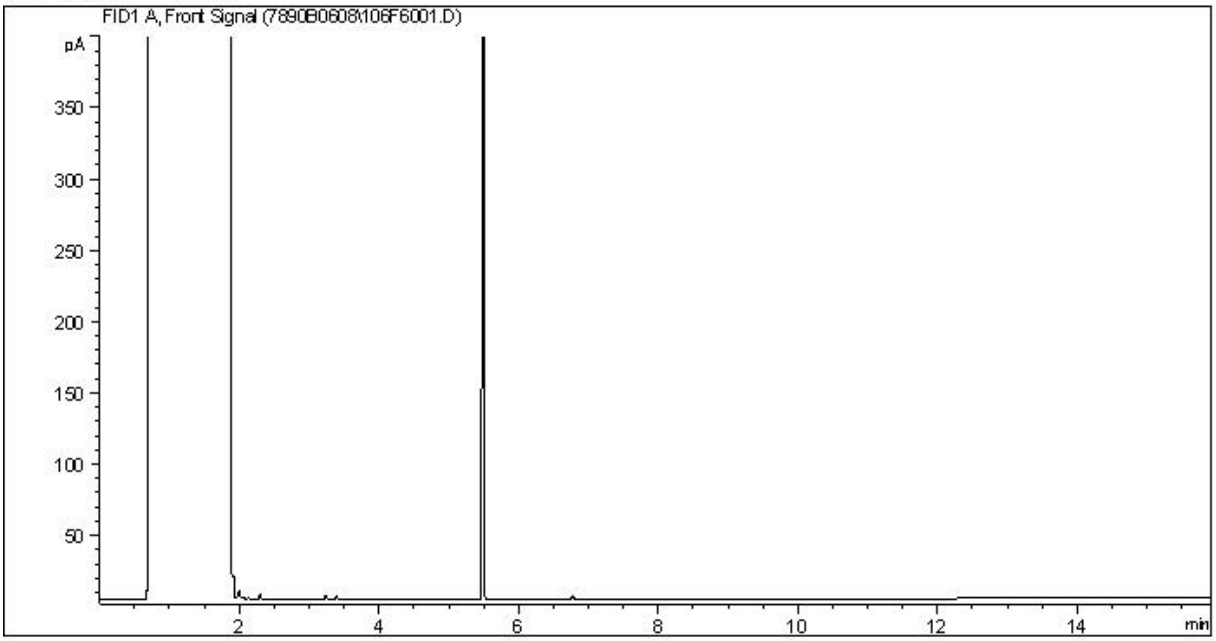
Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6453

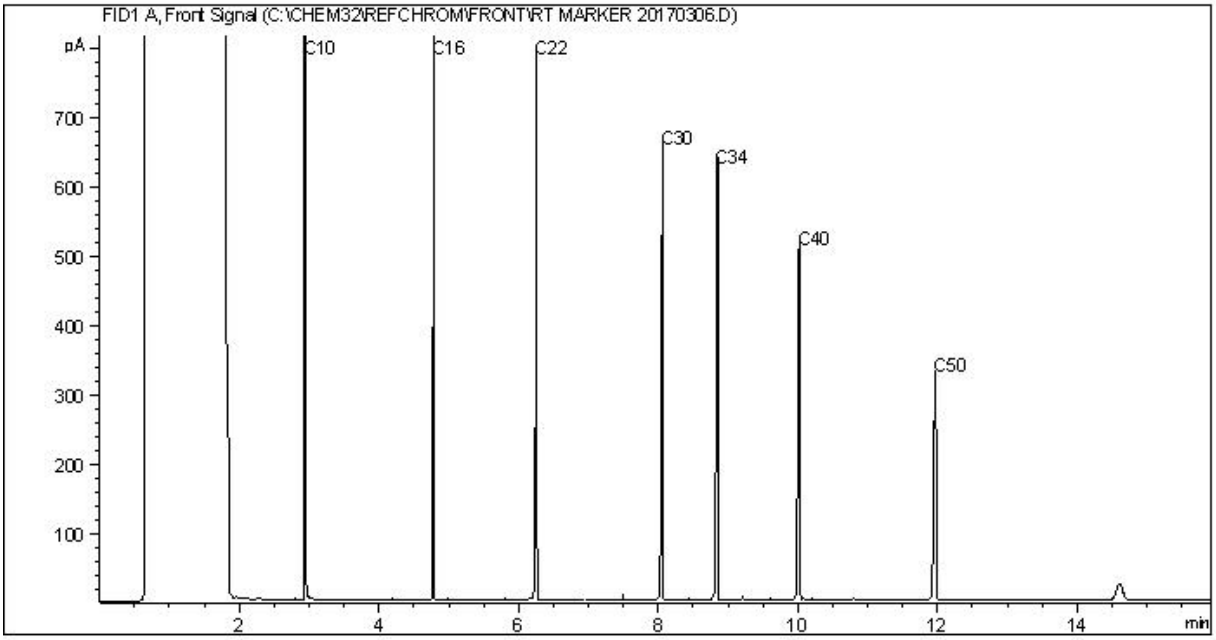
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-36A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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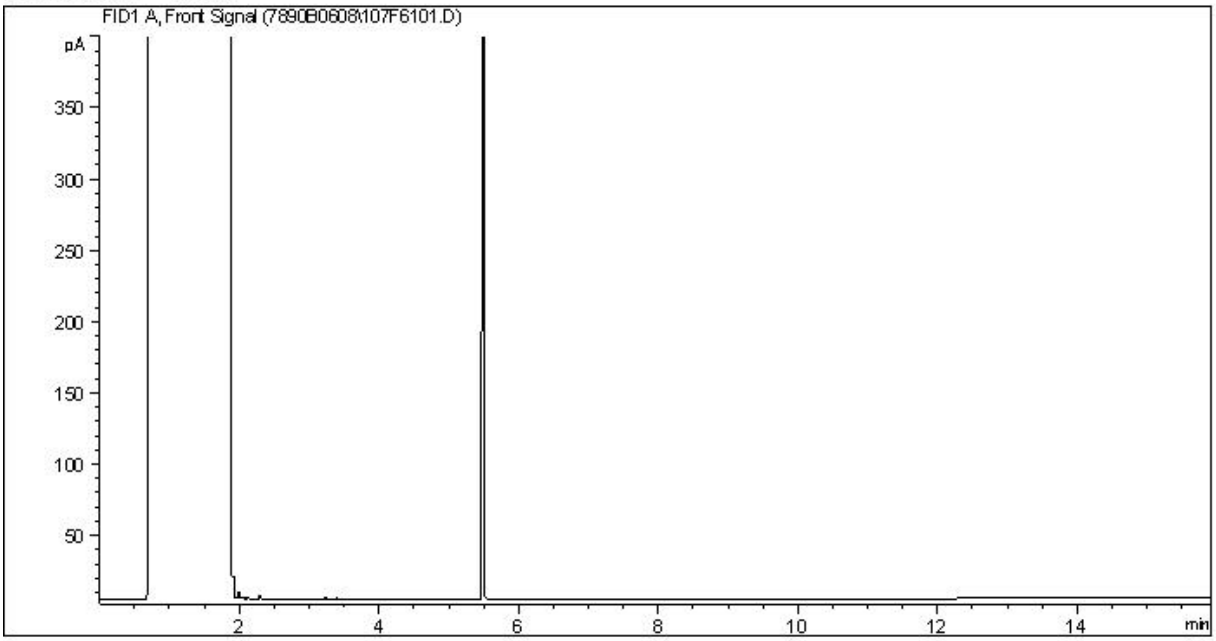
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

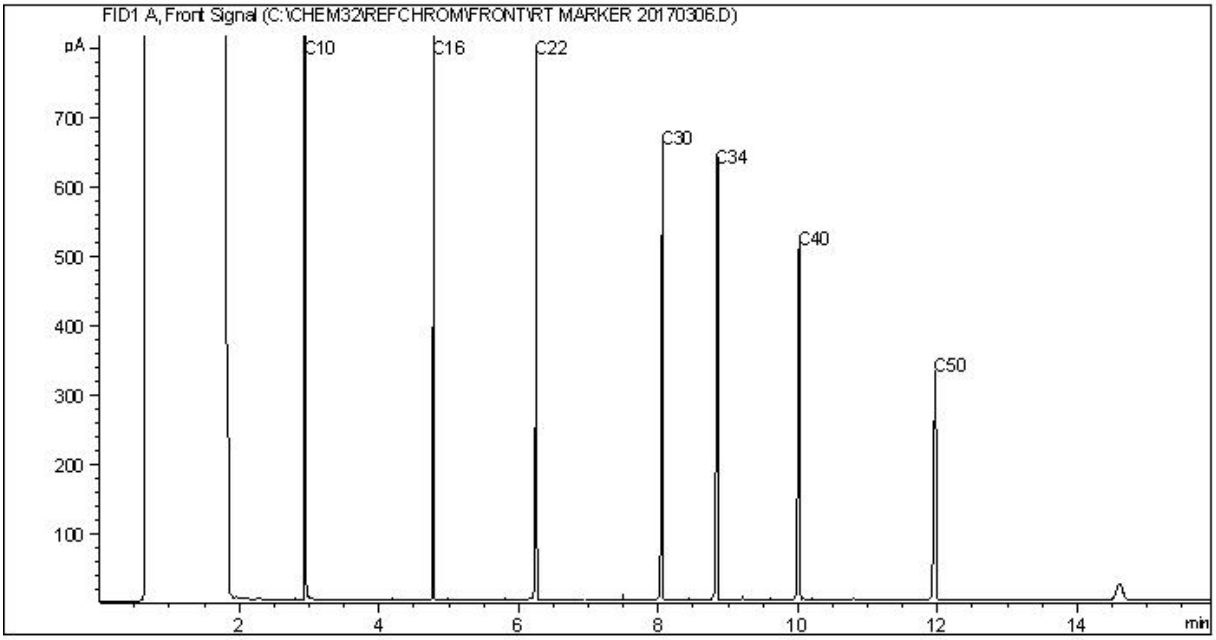
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
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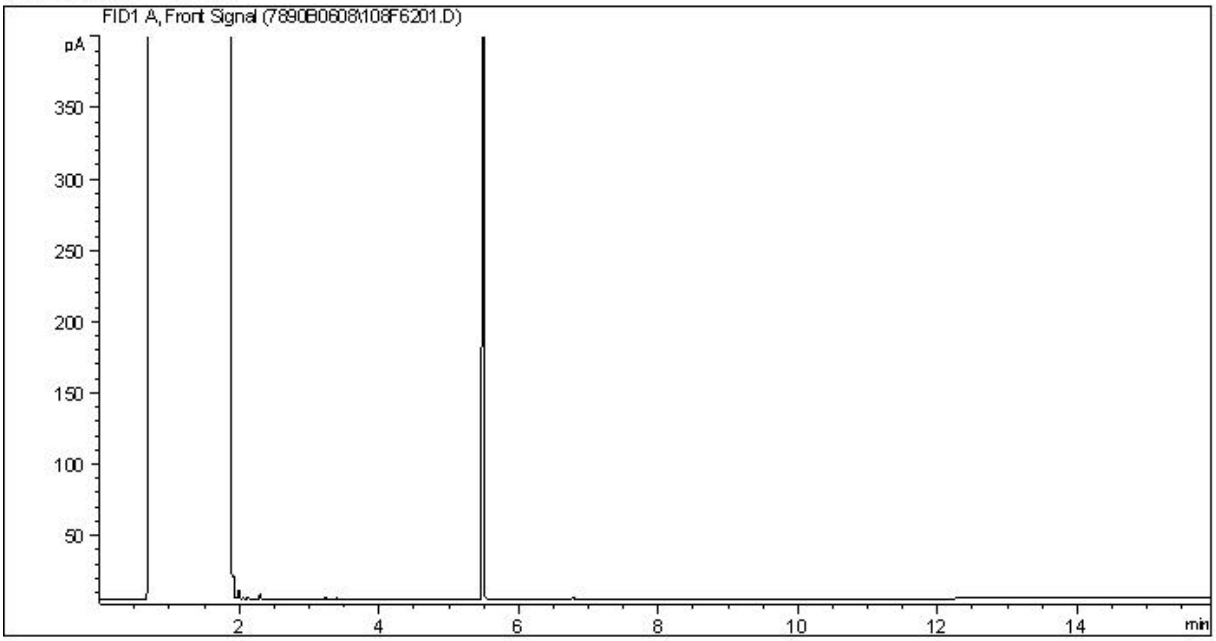
Maxxam Job #: B744752
Report Date: 2017/06/16
Maxxam Sample: RF6456

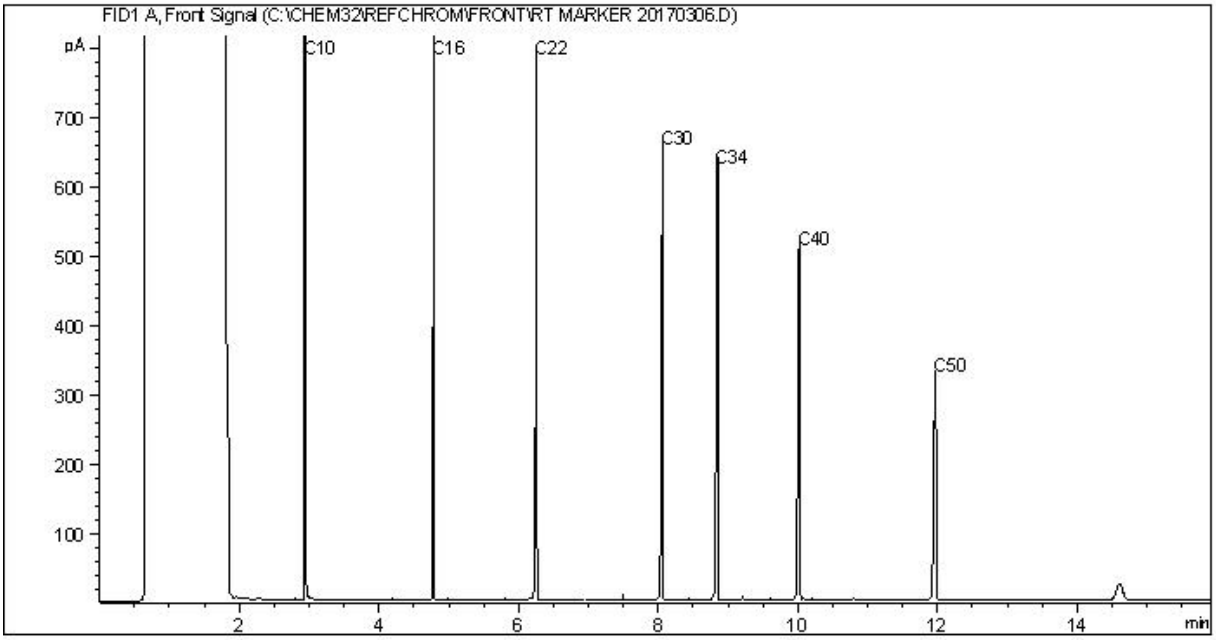
TETRA TECH CANADA INC.
Client Project #: 704-SWM.SWOP03652-01
Site Reference: RYLEY LANDFILL
Client ID: 17DUPLICATE4

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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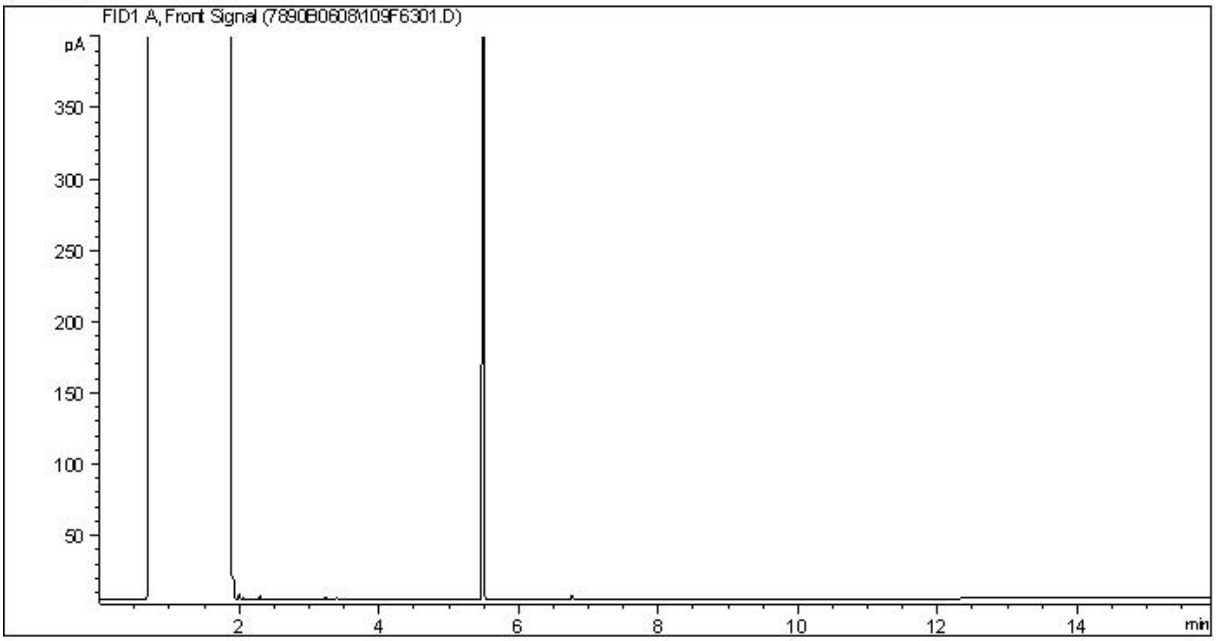
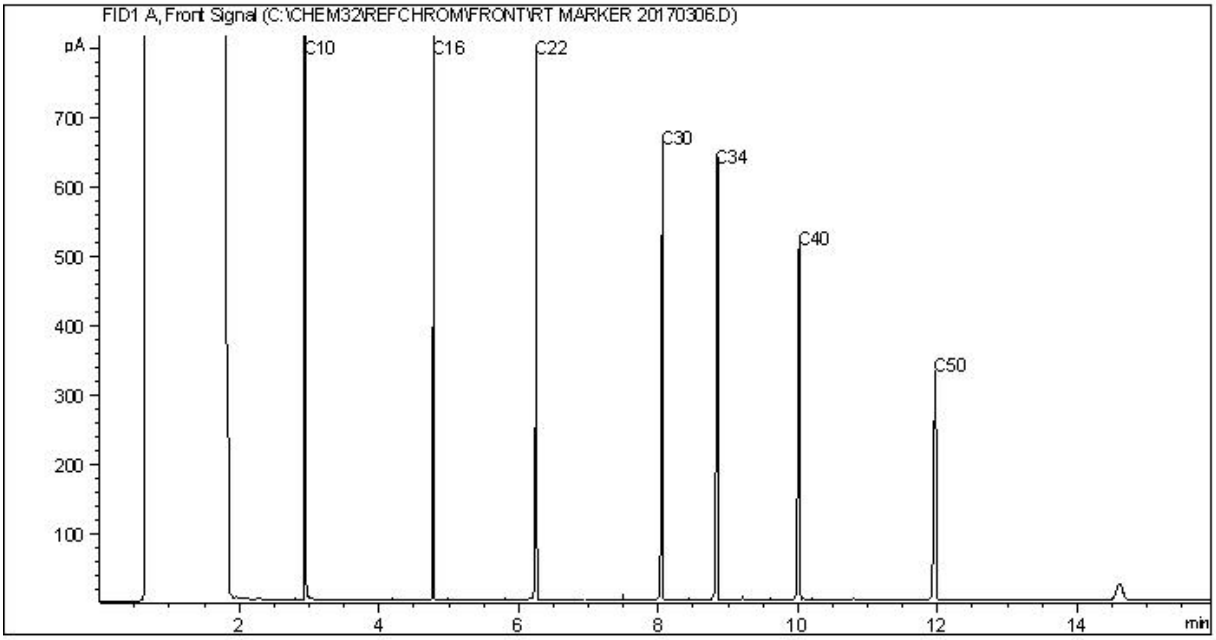
Instrument: 7890B



Carbon Range Distribution - Reference Chromatogram



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Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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Your P.O. #: 704-SWM.SWP03652-01
Your Project #: SWM.SWP03652-01
Site Location: RYLEY LANDFILL
Your C.O.C. #: m056732

Attention:MICHELE CRAWFORD

TETRA TECH CANADA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Report Date: 2017/06/16
Report #: R2398886
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B744968
Received: 2017/06/07, 15:35

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	4	N/A	2017/06/13	AB SOP-00005	SM 22 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	4	N/A	2017/06/10	AB SOP-00039	CCME CWS/EPA 8260C m
Cadmium - low level CCME - Dissolved	4	N/A	2017/06/14	AB WI-00065	Auto Calc
Chloride by Automated Colourimetry	4	N/A	2017/06/13	AB SOP-00020	SM 22 4500-Cl E m
Chemical Oxygen Demand	4	N/A	2017/06/09	AB SOP-00016	SM 22 5220D m
Carbon (DOC) (2)	4	N/A	2017/06/14	EENVSOP-00060	MMCW 119 1996 m
Conductivity @25C	4	N/A	2017/06/13	AB SOP-00005	SM 22 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (3)	4	2017/06/08	2017/06/09	AB SOP-00040 / AB SOP-00037	CCME PHC-CWS m
Hardness	4	N/A	2017/06/13	AB WI-00065	Auto Calc
Mercury - Low Level (Dissolved) (4)	4	2017/06/14	2017/06/14	EENVSOP-00031	EPA 1631E/245.1 R3 m
Elements by ICP - Dissolved (4)	4	N/A	2017/06/13	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICPMS - Dissolved (4)	4	N/A	2017/06/13	AB SOP-00043	EPA 200.8 R5.4 m
Ion Balance	4	N/A	2017/06/09	AB WI-00065	Auto Calc
Sum of cations, anions	4	N/A	2017/06/13	AB WI-00065	Auto Calc
Ammonia-N (Total) (1)	4	N/A	2017/06/12	AB SOP-00007	EPA 350.1 R2.0 m
Nitrate and Nitrite	4	N/A	2017/06/16	AB WI-00065	Auto Calc
Nitrate + Nitrite-N (calculated)	4	N/A	2017/06/16	AB WI-00065	Auto Calc
Nitrogen (Nitrite - Nitrate) by IC	4	N/A	2017/06/15	AB SOP-00023	SM 22 4110 B m
pH @25°C (5)	4	N/A	2017/06/13	AB SOP-00005	SM 22 4500 H+ B m
Sulphate by Automated Colourimetry	4	N/A	2017/06/13	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Calculated)	4	N/A	2017/06/13	AB WI-00065	Auto Calc
Total Kjeldahl Nitrogen	3	2017/06/13	2017/06/14	AB SOP-00008	EPA 351.1 R 1978 m
Total Kjeldahl Nitrogen	1	2017/06/14	2017/06/15	AB SOP-00008	EPA 351.1 R 1978 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All

Your P.O. #: 704-SWM.SWP03652-01
Your Project #: SWM.SWP03652-01
Site Location: RYLEY LANDFILL
Your C.O.C. #: m056732

Attention:MICHELE CRAWFORD

TETRA TECH CANADA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Report Date: 2017/06/16
Report #: R2398886
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B744968
Received: 2017/06/07, 15:35

data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

(1) This test was performed by Maxxam Calgary Environmental
(2) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: Whenever applicable, Dissolved >Total for any parameter that falls within method uncertainty for duplicates is likely equivalent. If RPD is >20% samples were reanalyzed and confirmed.
(3) Silica gel clean up employed.
(4) Dissolved > Total Imbalance: Whenever applicable, Dissolved >Total for any parameter that falls within method uncertainty for duplicates is likely equivalent. If RPD is >20% samples were reanalyzed and confirmed.
(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Maxxam endeavours to analyze samples as soon as possible after receipt.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ioana Stoica, Project Manager
Email: IStoica@maxxam.ca
Phone# (403)735-2227
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B744968
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: SWM.SWP03652-01
Site Location: RYLEY LANDFILL
Your P.O. #: 704-SWM.SWP03652-01
Sampler Initials: BS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		RF7901	RF7902	RF7903	RF7904		
Sampling Date		2017/06/07 13:45	2017/06/07 13:20	2017/06/07 13:05	2017/06/07 13:30		
COC Number		m056732	m056732	m056732	m056732		
	UNITS	MW-9	MW-10	MW-11	MW-14	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	8656902
Volatiles							
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8657695
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8657695
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8657695
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	8657695
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	8657695
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	8657695
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	8657695
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	8657695
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	98	101	100	99	N/A	8657695
4-Bromofluorobenzene (sur.)	%	99	98	99	98	N/A	8657695
D4-1,2-Dichloroethane (sur.)	%	104	102	105	105	N/A	8657695
O-TERPHENYL (sur.)	%	91	83	91	89	N/A	8656902

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

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Client Project #: SWM.SWP03652-01
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Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF7901		RF7902			RF7903		
Sampling Date		2017/06/07 13:45		2017/06/07 13:20			2017/06/07 13:05		
COC Number		m056732		m056732			m056732		
	UNITS	MW-9	RDL	MW-10	RDL	QC Batch	MW-11	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	75	N/A	46	N/A	8656524	110	N/A	8656524
Cation Sum	meq/L	62	N/A	44	N/A	8656524	110	N/A	8656524
Hardness (CaCO3)	mg/L	390	0.50	310	0.50	8656522	980	0.50	8656522
Ion Balance (% Difference)	%	10	N/A	2.0	N/A	8656523	0.26	N/A	8656523
Dissolved Nitrate (NO3)	mg/L	1.8	0.044	3.0	0.22	8656725	0.71	0.22	8656726
Nitrate plus Nitrite (N)	mg/L	0.43	0.010	0.68	0.050	8656727	0.16	0.050	8656727
Dissolved Nitrite (NO2)	mg/L	0.047	0.033	<0.16	0.16	8656725	<0.16	0.16	8656726
Calculated Total Dissolved Solids	mg/L	4700	10	3000	10	8656525	7500	10	8656525
Misc. Inorganics									
Conductivity	uS/cm	6400	1.0	4100	1.0	8661314	9100	1.0	8661314
pH	pH	7.88	N/A	8.11	N/A	8661297	7.88	N/A	8661297
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	0.053	0.020	0.021	0.020	8656521	0.029	0.020	8656521
Anions									
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	<0.50	0.50	8661313	<0.50	0.50	8661313
Alkalinity (Total as CaCO3)	mg/L	760	0.50	520	0.50	8661313	850	0.50	8661313
Bicarbonate (HCO3)	mg/L	920	0.50	630	0.50	8661313	1000	0.50	8661313
Carbonate (CO3)	mg/L	<0.50	0.50	<0.50	0.50	8661313	<0.50	0.50	8661313
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	0.50	8661313	<0.50	0.50	8661313
Dissolved Sulphate (SO4)	mg/L	2800 (1)	20	1600 (1)	10	8658038	4500 (1)	50	8658038
Dissolved Chloride (Cl)	mg/L	69	1.0	59	1.0	8658025	37 (2)	2.0	8658025
Nutrients									
Dissolved Nitrite (N)	mg/L	0.014	0.010	<0.050 (3)	0.050	8659213	<0.050 (2)	0.050	8659213
Dissolved Nitrate (N)	mg/L	0.41	0.010	0.68 (3)	0.050	8659213	0.16 (2)	0.050	8659213
Elements									
Dissolved Aluminum (Al)	mg/L	0.0038	0.0030	<0.0030	0.0030	8662080	<0.0030	0.0030	8662080
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	<0.00060	0.00060	8662080	<0.00060	0.00060	8662080

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to matrix interference.
(3) Detection limits raised due to sample matrix.

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Maxxam Job #: B744968
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TETRA TECH CANADA INC.
Client Project #: SWM.SWP03652-01
Site Location: RYLEY LANDFILL
Your P.O. #: 704-SWM.SWP03652-01
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF7901		RF7902			RF7903		
Sampling Date		2017/06/07 13:45		2017/06/07 13:20			2017/06/07 13:05		
COC Number		m056732		m056732			m056732		
	UNITS	MW-9	RDL	MW-10	RDL	QC Batch	MW-11	RDL	QC Batch
Dissolved Arsenic (As)	mg/L	0.00093	0.00020	0.00042	0.00020	8662080	0.0011	0.00020	8662080
Dissolved Barium (Ba)	mg/L	0.046	0.010	0.023	0.010	8662300	<0.10	0.10	8662300
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8662080	<0.0010	0.0010	8662080
Dissolved Boron (B)	mg/L	0.28	0.020	0.13	0.020	8662300	<0.20	0.20	8662300
Dissolved Calcium (Ca)	mg/L	79	0.30	71	0.30	8662300	200	3.0	8662300
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	0.0018	0.0010	8662080	<0.0010	0.0010	8662080
Dissolved Cobalt (Co)	mg/L	0.0016	0.00030	0.00045	0.00030	8662080	<0.00030	0.00030	8662080
Dissolved Copper (Cu)	mg/L	0.0042	0.00020	0.0033	0.00020	8662080	0.0025	0.00020	8662080
Dissolved Iron (Fe)	mg/L	<0.060	0.060	<0.060	0.060	8662300	<0.60	0.60	8662300
Dissolved Lead (Pb)	mg/L	0.00030	0.00020	<0.00020	0.00020	8662080	<0.00020	0.00020	8662080
Dissolved Lithium (Li)	mg/L	0.21	0.020	0.24	0.020	8662300	0.60	0.20	8662300
Dissolved Magnesium (Mg)	mg/L	46	0.20	32	0.20	8662300	120	2.0	8662300
Dissolved Manganese (Mn)	mg/L	0.37	0.0040	0.076	0.0040	8662300	<0.040	0.040	8662300
Dissolved Molybdenum (Mo)	mg/L	0.072	0.00020	0.0022	0.00020	8662080	0.0011	0.00020	8662080
Dissolved Nickel (Ni)	mg/L	0.013	0.00050	0.033	0.00050	8662080	0.0055	0.00050	8662080
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	<0.10	0.10	8662300	<1.0	1.0	8662300
Dissolved Potassium (K)	mg/L	12	0.30	4.2	0.30	8662300	8.0	3.0	8662300
Dissolved Selenium (Se)	mg/L	0.0021	0.00020	0.00053	0.00020	8662080	0.00079	0.00020	8662080
Dissolved Silicon (Si)	mg/L	4.3	0.10	4.8	0.10	8662300	4.8	1.0	8662300
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	<0.00010	0.00010	8662080	<0.00010	0.00010	8662080
Dissolved Sodium (Na)	mg/L	1200 (1)	5.0	870 (1)	5.0	8662300	2100	5.0	8662300
Dissolved Strontium (Sr)	mg/L	1.3	0.020	1.0	0.020	8662300	3.8	0.20	8662300
Dissolved Sulphur (S)	mg/L	730 (1)	2.0	530 (1)	2.0	8662300	1500	2.0	8662300
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	<0.00020	0.00020	8662080	<0.00020	0.00020	8662080
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8662080	<0.0010	0.0010	8662080
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8662080	<0.0010	0.0010	8662080
Dissolved Uranium (U)	mg/L	0.0056	0.00010	0.0086	0.00010	8662080	0.030	0.00010	8662080
Dissolved Vanadium (V)	mg/L	0.0089	0.0010	<0.0010	0.0010	8662080	<0.0010	0.0010	8662080
Dissolved Zinc (Zn)	mg/L	0.0094	0.0030	<0.0030	0.0030	8662080	0.0044	0.0030	8662080

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Client Project #: SWM.SWP03652-01
Site Location: RYLEY LANDFILL
Your P.O. #: 704-SWM.SWP03652-01
Sampler Initials: BS

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF7904		
Sampling Date		2017/06/07 13:30		
COC Number		m056732		
	UNITS	MW-14	RDL	QC Batch
Calculated Parameters				
Anion Sum	meq/L	60	N/A	8656524
Cation Sum	meq/L	60	N/A	8656524
Hardness (CaCO3)	mg/L	1400	0.50	8656522
Ion Balance (% Difference)	%	0.14	N/A	8656523
Dissolved Nitrate (NO3)	mg/L	7.8	0.22	8656726
Nitrate plus Nitrite (N)	mg/L	1.8	0.050	8656727
Dissolved Nitrite (NO2)	mg/L	0.29	0.16	8656726
Calculated Total Dissolved Solids	mg/L	3700	10	8656525
Misc. Inorganics				
Conductivity	uS/cm	4700	1.0	8661314
pH	pH	7.90	N/A	8661297
Low Level Elements				
Dissolved Cadmium (Cd)	ug/L	0.029	0.020	8656521
Anions				
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8661313
Alkalinity (Total as CaCO3)	mg/L	990	0.50	8661313
Bicarbonate (HCO3)	mg/L	1200	0.50	8661313
Carbonate (CO3)	mg/L	<0.50	0.50	8661313
Hydroxide (OH)	mg/L	<0.50	0.50	8661313
Dissolved Sulphate (SO4)	mg/L	1900 (1)	20	8658038
Dissolved Chloride (Cl)	mg/L	1.5	1.0	8658025
Nutrients				
Dissolved Nitrite (N)	mg/L	0.090 (2)	0.050	8659213
Dissolved Nitrate (N)	mg/L	1.8 (2)	0.050	8659213
Elements				
Dissolved Aluminum (Al)	mg/L	<0.0030	0.0030	8662080
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	8662080

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Detection limits raised due to sample matrix.

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ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		RF7904		
Sampling Date		2017/06/07 13:30		
COC Number		m056732		
	UNITS	MW-14	RDL	QC Batch
Dissolved Arsenic (As)	mg/L	0.00054	0.00020	8662080
Dissolved Barium (Ba)	mg/L	0.040	0.010	8662300
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	8662080
Dissolved Boron (B)	mg/L	0.14	0.020	8662300
Dissolved Calcium (Ca)	mg/L	230	0.30	8662300
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	8662080
Dissolved Cobalt (Co)	mg/L	0.0018	0.00030	8662080
Dissolved Copper (Cu)	mg/L	0.00084	0.00020	8662080
Dissolved Iron (Fe)	mg/L	<0.060	0.060	8662300
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	8662080
Dissolved Lithium (Li)	mg/L	0.38	0.020	8662300
Dissolved Magnesium (Mg)	mg/L	200	0.20	8662300
Dissolved Manganese (Mn)	mg/L	0.57	0.0040	8662300
Dissolved Molybdenum (Mo)	mg/L	0.00059	0.00020	8662080
Dissolved Nickel (Ni)	mg/L	0.0031	0.00050	8662080
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	8662300
Dissolved Potassium (K)	mg/L	25	0.30	8662300
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	8662080
Dissolved Silicon (Si)	mg/L	6.9	0.10	8662300
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	8662080
Dissolved Sodium (Na)	mg/L	730 (1)	5.0	8662300
Dissolved Strontium (Sr)	mg/L	3.6	0.020	8662300
Dissolved Sulphur (S)	mg/L	660 (1)	2.0	8662300
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	8662080
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	8662080
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	8662080
Dissolved Uranium (U)	mg/L	0.00075	0.00010	8662080
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	8662080
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	8662080

RDL = Reportable Detection Limit

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

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Sampler Initials: BS

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		RF7901		RF7902		RF7903			RF7904		
Sampling Date		2017/06/07 13:45		2017/06/07 13:20		2017/06/07 13:05			2017/06/07 13:30		
COC Number		m056732		m056732		m056732			m056732		
	UNITS	MW-9	RDL	MW-10	RDL	MW-11	RDL	QC Batch	MW-14	RDL	QC Batch
Demand Parameters											
Total Chemical Oxygen Demand	mg/L	110	5.0	24	5.0	84	5.0	8658063	25	5.0	8658063
Misc. Inorganics											
Dissolved Organic Carbon (C)	mg/L	23 (1)	1.0	8.0	0.50	31 (1)	1.0	8663561	8.2	0.50	8663561
Nutrients											
Total Ammonia (N)	mg/L	0.23	0.015	0.052	0.015	0.086	0.015	8660478	0.20	0.015	8660403
Total Total Kjeldahl Nitrogen	mg/L	2.4 (1)	0.25	0.49	0.050	1.5	0.050	8661983	0.80	0.050	8663887

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

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		RF7901	RF7902	RF7903	RF7904		
Sampling Date		2017/06/07 13:45	2017/06/07 13:20	2017/06/07 13:05	2017/06/07 13:30		
COC Number		m056732	m056732	m056732	m056732		
	UNITS	MW-9	MW-10	MW-11	MW-14	RDL	QC Batch
Low Level Elements							
Dissolved Mercury (Hg)	ug/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8662718
RDL = Reportable Detection Limit							

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GENERAL COMMENTS

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

Package 1	7.3°C

Sample RF7901 [MW-9] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF7902 [MW-10] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF7903 [MW-11] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample RF7904 [MW-14] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8656902	KK5	Matrix Spike	O-TERPHENYL (sur.)	2017/06/09		91	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09		114	%	60 - 130
8656902	KK5	Spiked Blank	O-TERPHENYL (sur.)	2017/06/09		91	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09		114	%	70 - 130
8656902	KK5	Method Blank	O-TERPHENYL (sur.)	2017/06/09		90	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/06/09	<0.10		mg/L	
8656902	KK5	RPD	F2 (C10-C16 Hydrocarbons)	2017/06/09	NC		%	30
8657695	HG3	Matrix Spike [RF7902-07]	1,4-Difluorobenzene (sur.)	2017/06/10		99	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/10		98	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/10		104	%	70 - 130
			Benzene	2017/06/10		96	%	70 - 130
			Toluene	2017/06/10		89	%	70 - 130
			Ethylbenzene	2017/06/10		95	%	70 - 130
			m & p-Xylene	2017/06/10		93	%	70 - 130
			o-Xylene	2017/06/10		94	%	70 - 130
			F1 (C6-C10)	2017/06/10		78	%	70 - 130
8657695	HG3	Spiked Blank	1,4-Difluorobenzene (sur.)	2017/06/10		101	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/10		98	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/10		101	%	70 - 130
			Benzene	2017/06/10		97	%	70 - 130
			Toluene	2017/06/10		91	%	70 - 130
			Ethylbenzene	2017/06/10		96	%	70 - 130
			m & p-Xylene	2017/06/10		97	%	70 - 130
			o-Xylene	2017/06/10		96	%	70 - 130
			F1 (C6-C10)	2017/06/10		102	%	70 - 130
8657695	HG3	Method Blank	1,4-Difluorobenzene (sur.)	2017/06/10		100	%	70 - 130
			4-Bromofluorobenzene (sur.)	2017/06/10		99	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2017/06/10		101	%	70 - 130
			Benzene	2017/06/10	<0.00040		mg/L	
			Toluene	2017/06/10	<0.00040		mg/L	
			Ethylbenzene	2017/06/10	<0.00040		mg/L	
			m & p-Xylene	2017/06/10	<0.00080		mg/L	
			o-Xylene	2017/06/10	<0.00040		mg/L	
			Xylenes (Total)	2017/06/10	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2017/06/10	<0.10		mg/L	
			F1 (C6-C10)	2017/06/10	<0.10		mg/L	
8657695	HG3	RPD [RF7901-07]	Benzene	2017/06/10	NC		%	30
			Toluene	2017/06/10	NC		%	30
			Ethylbenzene	2017/06/10	NC		%	30
			m & p-Xylene	2017/06/10	NC		%	30
			o-Xylene	2017/06/10	NC		%	30
			Xylenes (Total)	2017/06/10	NC		%	30
			F1 (C6-C10) - BTEX	2017/06/10	NC		%	30
			F1 (C6-C10)	2017/06/10	NC		%	30
8658025	CH7	Matrix Spike	Dissolved Chloride (Cl)	2017/06/13		108	%	80 - 120
8658025	CH7	Spiked Blank	Dissolved Chloride (Cl)	2017/06/13		102	%	80 - 120
8658025	CH7	Method Blank	Dissolved Chloride (Cl)	2017/06/13	<1.0		mg/L	
8658025	CH7	RPD	Dissolved Chloride (Cl)	2017/06/13	2.5		%	20
8658038	CH7	Matrix Spike	Dissolved Sulphate (SO4)	2017/06/13		NC	%	80 - 120
8658038	CH7	Spiked Blank	Dissolved Sulphate (SO4)	2017/06/13		109	%	80 - 120
8658038	CH7	Method Blank	Dissolved Sulphate (SO4)	2017/06/13	<1.0		mg/L	

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Maxxam Job #: B744968
Report Date: 2017/06/16

TETRA TECH CANADA INC.
Client Project #: SWM.SWP03652-01
Site Location: RYLEY LANDFILL
Your P.O. #: 704-SWM.SWP03652-01
Sampler Initials: BS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8658038	CH7	RPD	Dissolved Sulphate (SO4)	2017/06/13	0.12		%	20
8658063	MRD	Matrix Spike	Total Chemical Oxygen Demand	2017/06/09		102	%	80 - 120
8658063	MRD	Spiked Blank	Total Chemical Oxygen Demand	2017/06/09		101	%	80 - 120
8658063	MRD	Method Blank	Total Chemical Oxygen Demand	2017/06/09	<5.0		mg/L	
8658063	MRD	RPD	Total Chemical Oxygen Demand	2017/06/09	8.8		%	20
8659213	LMD	Matrix Spike	Dissolved Nitrite (N)	2017/06/15		104	%	80 - 120
			Dissolved Nitrate (N)	2017/06/15		104	%	80 - 120
8659213	LMD	Spiked Blank	Dissolved Nitrite (N)	2017/06/15		98	%	80 - 120
			Dissolved Nitrate (N)	2017/06/15		99	%	80 - 120
8659213	LMD	Method Blank	Dissolved Nitrite (N)	2017/06/15	<0.010		mg/L	
			Dissolved Nitrate (N)	2017/06/15	<0.010		mg/L	
8659213	LMD	RPD	Dissolved Nitrite (N)	2017/06/15	NC		%	20
			Dissolved Nitrate (N)	2017/06/15	NC		%	20
8660403	JLD	Matrix Spike	Total Ammonia (N)	2017/06/12		102	%	80 - 120
8660403	JLD	Spiked Blank	Total Ammonia (N)	2017/06/12		101	%	80 - 120
8660403	JLD	Method Blank	Total Ammonia (N)	2017/06/12	<0.015		mg/L	
8660403	JLD	RPD	Total Ammonia (N)	2017/06/12	2.0		%	20
8660478	JLD	Matrix Spike	Total Ammonia (N)	2017/06/12		108	%	80 - 120
8660478	JLD	Spiked Blank	Total Ammonia (N)	2017/06/12		104	%	80 - 120
8660478	JLD	Method Blank	Total Ammonia (N)	2017/06/12	<0.015		mg/L	
8660478	JLD	RPD	Total Ammonia (N)	2017/06/12	0.58		%	20
8661297	MA4	Spiked Blank	pH	2017/06/13		100	%	97 - 103
8661297	MA4	RPD	pH	2017/06/13	0.22		%	N/A
8661313	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2017/06/13		100	%	80 - 120
8661313	MA4	Method Blank	Alkalinity (PP as CaCO3)	2017/06/13	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2017/06/13	<0.50		mg/L	
			Bicarbonate (HCO3)	2017/06/13	<0.50		mg/L	
			Carbonate (CO3)	2017/06/13	<0.50		mg/L	
			Hydroxide (OH)	2017/06/13	<0.50		mg/L	
8661313	MA4	RPD	Alkalinity (PP as CaCO3)	2017/06/13	NC		%	20
			Alkalinity (Total as CaCO3)	2017/06/13	5.3		%	20
			Bicarbonate (HCO3)	2017/06/13	5.3		%	20
			Carbonate (CO3)	2017/06/13	NC		%	20
			Hydroxide (OH)	2017/06/13	NC		%	20
8661314	MA4	Spiked Blank	Conductivity	2017/06/13		101	%	90 - 110
8661314	MA4	Method Blank	Conductivity	2017/06/13	<1.0		uS/cm	
8661314	MA4	RPD	Conductivity	2017/06/13	0		%	10
8661983	AF6	Matrix Spike	Total Total Kjeldahl Nitrogen	2017/06/14		90	%	80 - 120
8661983	AF6	QC Standard	Total Total Kjeldahl Nitrogen	2017/06/14		98	%	80 - 120
8661983	AF6	Spiked Blank	Total Total Kjeldahl Nitrogen	2017/06/14		106	%	80 - 120
8661983	AF6	Method Blank	Total Total Kjeldahl Nitrogen	2017/06/14	<0.050		mg/L	
8661983	AF6	RPD	Total Total Kjeldahl Nitrogen	2017/06/14	11		%	20
8662080	APY	Matrix Spike	Dissolved Aluminum (Al)	2017/06/13		96	%	80 - 120
			Dissolved Antimony (Sb)	2017/06/13		108	%	80 - 120
			Dissolved Arsenic (As)	2017/06/13		99	%	80 - 120
			Dissolved Beryllium (Be)	2017/06/13		95	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/13		97	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/13		93	%	80 - 120
			Dissolved Copper (Cu)	2017/06/13		90	%	80 - 120
			Dissolved Lead (Pb)	2017/06/13		95	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/06/13		109	%	80 - 120

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TETRA TECH CANADA INC.
Client Project #: SWM.SWP03652-01
Site Location: RYLEY LANDFILL
Your P.O. #: 704-SWM.SWP03652-01
Sampler Initials: BS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Nickel (Ni)	2017/06/13		90	%	80 - 120
			Dissolved Selenium (Se)	2017/06/13		106	%	80 - 120
			Dissolved Silver (Ag)	2017/06/13		99	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/13		98	%	80 - 120
			Dissolved Tin (Sn)	2017/06/13		108	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/13		99	%	80 - 120
			Dissolved Uranium (U)	2017/06/13		NC	%	80 - 120
			Dissolved Vanadium (V)	2017/06/13		99	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/13		93	%	80 - 120
8662080	APY	Spiked Blank	Dissolved Aluminum (Al)	2017/06/13		97	%	80 - 120
			Dissolved Antimony (Sb)	2017/06/13		101	%	80 - 120
			Dissolved Arsenic (As)	2017/06/13		96	%	80 - 120
			Dissolved Beryllium (Be)	2017/06/13		90	%	80 - 120
			Dissolved Chromium (Cr)	2017/06/13		97	%	80 - 120
			Dissolved Cobalt (Co)	2017/06/13		95	%	80 - 120
			Dissolved Copper (Cu)	2017/06/13		96	%	80 - 120
			Dissolved Lead (Pb)	2017/06/13		100	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/06/13		100	%	80 - 120
			Dissolved Nickel (Ni)	2017/06/13		95	%	80 - 120
			Dissolved Selenium (Se)	2017/06/13		103	%	80 - 120
			Dissolved Silver (Ag)	2017/06/13		102	%	80 - 120
			Dissolved Thallium (Tl)	2017/06/13		104	%	80 - 120
			Dissolved Tin (Sn)	2017/06/13		102	%	80 - 120
			Dissolved Titanium (Ti)	2017/06/13		99	%	80 - 120
			Dissolved Uranium (U)	2017/06/13		99	%	80 - 120
			Dissolved Vanadium (V)	2017/06/13		98	%	80 - 120
			Dissolved Zinc (Zn)	2017/06/13		99	%	80 - 120
8662080	APY	Method Blank	Dissolved Aluminum (Al)	2017/06/13	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2017/06/13	<0.00060		mg/L	
			Dissolved Arsenic (As)	2017/06/13	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2017/06/13	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2017/06/13	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2017/06/13	<0.00030		mg/L	
			Dissolved Copper (Cu)	2017/06/13	<0.00020		mg/L	
			Dissolved Lead (Pb)	2017/06/13	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2017/06/13	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2017/06/13	<0.00050		mg/L	
			Dissolved Selenium (Se)	2017/06/13	<0.00020		mg/L	
			Dissolved Silver (Ag)	2017/06/13	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2017/06/13	<0.00020		mg/L	
			Dissolved Tin (Sn)	2017/06/13	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2017/06/13	<0.0010		mg/L	
			Dissolved Uranium (U)	2017/06/13	<0.00010		mg/L	
			Dissolved Vanadium (V)	2017/06/13	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2017/06/13	<0.0030		mg/L	
8662080	APY	RPD	Dissolved Aluminum (Al)	2017/06/13	8.6		%	20
			Dissolved Antimony (Sb)	2017/06/13	NC		%	20
			Dissolved Arsenic (As)	2017/06/13	6.6		%	20
			Dissolved Beryllium (Be)	2017/06/13	NC		%	20
			Dissolved Chromium (Cr)	2017/06/13	NC		%	20
			Dissolved Cobalt (Co)	2017/06/13	4.8		%	20

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TETRA TECH CANADA INC.
Client Project #: SWM.SWP03652-01
Site Location: RYLEY LANDFILL
Your P.O. #: 704-SWM.SWP03652-01
Sampler Initials: BS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Copper (Cu)	2017/06/13	15		%	20
			Dissolved Lead (Pb)	2017/06/13	NC		%	20
			Dissolved Molybdenum (Mo)	2017/06/13	0.68		%	20
			Dissolved Nickel (Ni)	2017/06/13	0.51		%	20
			Dissolved Selenium (Se)	2017/06/13	3.4		%	20
			Dissolved Silver (Ag)	2017/06/13	NC		%	20
			Dissolved Thallium (Tl)	2017/06/13	NC		%	20
			Dissolved Tin (Sn)	2017/06/13	NC		%	20
			Dissolved Titanium (Ti)	2017/06/13	NC		%	20
			Dissolved Uranium (U)	2017/06/13	0.52		%	20
			Dissolved Vanadium (V)	2017/06/13	NC		%	20
			Dissolved Zinc (Zn)	2017/06/13	14		%	20
8662300	CJ5	Matrix Spike	Dissolved Barium (Ba)	2017/06/13		97	%	80 - 120
			Dissolved Boron (B)	2017/06/13		105	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/13		94	%	80 - 120
			Dissolved Iron (Fe)	2017/06/13		100	%	80 - 120
			Dissolved Lithium (Li)	2017/06/13		95	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/13		100	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/13		99	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/13		102	%	80 - 120
			Dissolved Potassium (K)	2017/06/13		100	%	80 - 120
			Dissolved Silicon (Si)	2017/06/13		90	%	80 - 120
			Dissolved Sodium (Na)	2017/06/13		96	%	80 - 120
			Dissolved Strontium (Sr)	2017/06/13		95	%	80 - 120
8662300	CJ5	Spiked Blank	Dissolved Barium (Ba)	2017/06/13		97	%	80 - 120
			Dissolved Boron (B)	2017/06/13		102	%	80 - 120
			Dissolved Calcium (Ca)	2017/06/13		99	%	80 - 120
			Dissolved Iron (Fe)	2017/06/13		102	%	80 - 120
			Dissolved Lithium (Li)	2017/06/13		95	%	80 - 120
			Dissolved Magnesium (Mg)	2017/06/13		99	%	80 - 120
			Dissolved Manganese (Mn)	2017/06/13		98	%	80 - 120
			Dissolved Phosphorus (P)	2017/06/13		100	%	80 - 120
			Dissolved Potassium (K)	2017/06/13		100	%	80 - 120
			Dissolved Silicon (Si)	2017/06/13		101	%	80 - 120
			Dissolved Sodium (Na)	2017/06/13		97	%	80 - 120
			Dissolved Strontium (Sr)	2017/06/13		95	%	80 - 120
8662300	CJ5	Method Blank	Dissolved Barium (Ba)	2017/06/13	<0.010		mg/L	
			Dissolved Boron (B)	2017/06/13	<0.020		mg/L	
			Dissolved Calcium (Ca)	2017/06/13	<0.30		mg/L	
			Dissolved Iron (Fe)	2017/06/13	<0.060		mg/L	
			Dissolved Lithium (Li)	2017/06/13	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2017/06/13	<0.20		mg/L	
			Dissolved Manganese (Mn)	2017/06/13	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2017/06/13	<0.10		mg/L	
			Dissolved Potassium (K)	2017/06/13	<0.30		mg/L	
			Dissolved Silicon (Si)	2017/06/13	<0.10		mg/L	
			Dissolved Sodium (Na)	2017/06/13	<0.50		mg/L	
			Dissolved Strontium (Sr)	2017/06/13	<0.020		mg/L	
			Dissolved Sulphur (S)	2017/06/13	<0.20		mg/L	
8662300	CJ5	RPD	Dissolved Barium (Ba)	2017/06/13	0.45		%	20
			Dissolved Boron (B)	2017/06/13	NC		%	20

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TETRA TECH CANADA INC.
Client Project #: SWM.SWP03652-01
Site Location: RYLEY LANDFILL
Your P.O. #: 704-SWM.SWP03652-01
Sampler Initials: BS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Calcium (Ca)	2017/06/13	0.27		%	20
			Dissolved Iron (Fe)	2017/06/13	NC		%	20
			Dissolved Lithium (Li)	2017/06/13	NC		%	20
			Dissolved Magnesium (Mg)	2017/06/13	0.23		%	20
			Dissolved Manganese (Mn)	2017/06/13	1.8		%	20
			Dissolved Phosphorus (P)	2017/06/13	NC		%	20
			Dissolved Potassium (K)	2017/06/13	0.97		%	20
			Dissolved Silicon (Si)	2017/06/13	0.023		%	20
			Dissolved Sodium (Na)	2017/06/13	0.78		%	20
			Dissolved Strontium (Sr)	2017/06/13	0.46		%	20
			Dissolved Sulphur (S)	2017/06/13	2.1		%	20
8662718	NP4	Matrix Spike	Dissolved Mercury (Hg)	2017/06/14		103	%	85 - 115
8662718	NP4	QC Standard	Dissolved Mercury (Hg)	2017/06/14		106	%	85 - 115
8662718	NP4	Spiked Blank	Dissolved Mercury (Hg)	2017/06/14		105	%	85 - 115
8662718	NP4	Method Blank	Dissolved Mercury (Hg)	2017/06/14	<0.0020		ug/L	
8662718	NP4	RPD	Dissolved Mercury (Hg)	2017/06/14	NC		%	20
8663561	YY	Matrix Spike	Dissolved Organic Carbon (C)	2017/06/14		102	%	80 - 120
8663561	YY	Spiked Blank	Dissolved Organic Carbon (C)	2017/06/14		103	%	80 - 120
8663561	YY	Method Blank	Dissolved Organic Carbon (C)	2017/06/14	<0.50		mg/L	
8663561	YY	RPD	Dissolved Organic Carbon (C)	2017/06/14	13		%	20
8663887	AF6	Matrix Spike	Total Total Kjeldahl Nitrogen	2017/06/15		96	%	80 - 120
8663887	AF6	QC Standard	Total Total Kjeldahl Nitrogen	2017/06/15		94	%	80 - 120
8663887	AF6	Spiked Blank	Total Total Kjeldahl Nitrogen	2017/06/15		106	%	80 - 120
8663887	AF6	Method Blank	Total Total Kjeldahl Nitrogen	2017/06/15	<0.050		mg/L	
8663887	AF6	RPD	Total Total Kjeldahl Nitrogen	2017/06/15	0.31		%	20
			Total Total Kjeldahl Nitrogen	2017/06/15	0.19		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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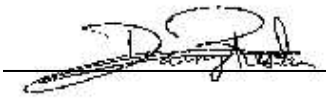
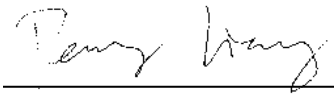
VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

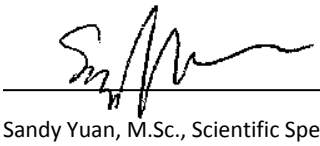


Daniel Reslan, cCT, QP, Organics Supervisor

Justin Geisel, B.Sc., Organics Supervisor



Harry (Peng) Liang, Senior Analyst



Sandy Yuan, M.Sc., Scientific Specialist

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

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

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0354

CHAIN OF CUSTODY RECORD M 056732

Page 1 of 1

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company: Tetra Tech	Company:	Quotation #: B60546	☒ 5 - 7 Days Regular (Most analyses)
Contact Name: Michele Crawford	Contact Name:	P.O. #/ AFE#: 704-SWM.SWOP03652-01	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 14940 123 Ave Edmonton, AB	Address:	Project #: SWM.SWOP03652-01	Rush TAT (Surcharges will be applied)
Phone: 780.451.2121	Phone:	Site Location: Ryley Landfill	☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Email: Michele.crawford@tetratech.com	Email:	Site #:	Date Required:
Copies: Brent.Schmidt@tetratech.com	Copies:	Sampled By: BS	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓				
Seal Intact			Temp	8	10	4
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☐	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals ☒ Tot ☐ Diss	Mercury ☒ Total ☐ Dissolved	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	Ammonia as N (total)	TKN + COD	Carbon (DOC)	HOLD - DO NOT ANALYZE
1	MW-9		2017/06/07	1345	water	9		X		X	X	X					X	X	X	
2	MW-10		↓	1320	↓	9		X		X	X	X					X	X	X	
3	MW-11			1305		9		X		X	X	X					X	X	X	
4	MW-14		↓	1330	↓	9		X		X	X	X					X	X	X	
5																				
6																				
7																				
8																				
9																				
10																				
	Please indicate Filtered, Preserved or Both (F, P, F/P)							P			F/P	F/P					P	P	F/P	

Regulatory Criteria

☐ AT1
☐ CCME
☐ Drinking Water
☐ D50 (Drilling Waste)
☐ Saskatchewan
☐ Other:

Special Instructions

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Brent Schmidt	2017/06/07	15:15	JOSH KNOSP	2017/06/07	15:35	B744968

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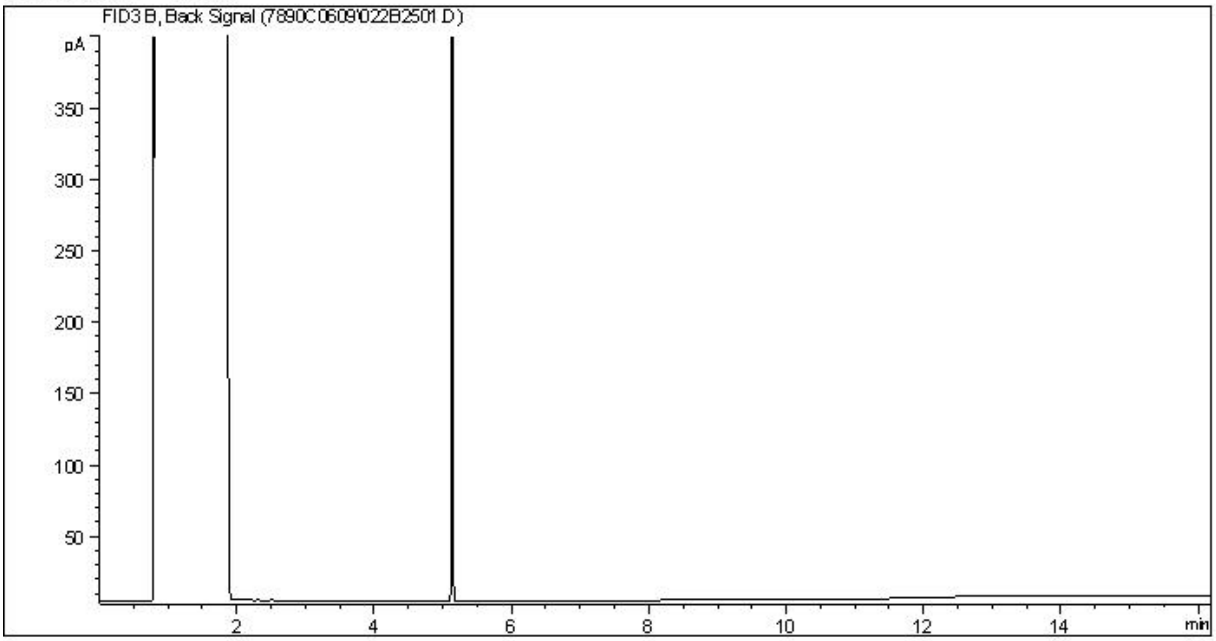
AB FCD-00331/7

Maxxam Job #: B744968
Report Date: 2017/06/16
Maxxam Sample: RF7901

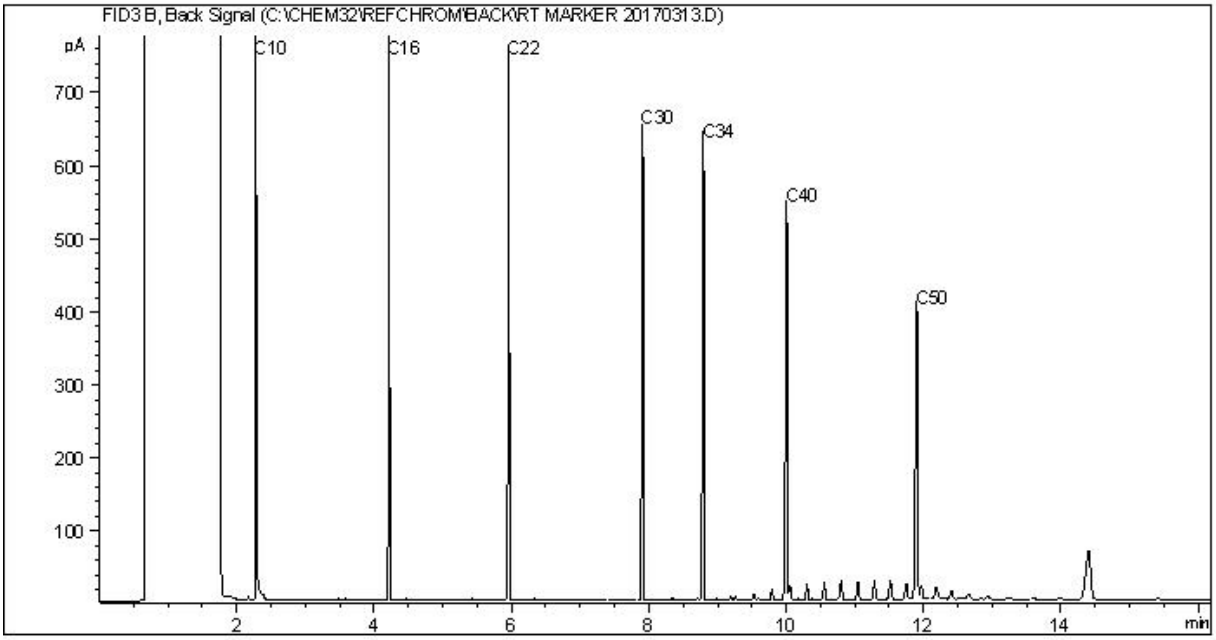
TETRA TECH CANADA INC.
Client Project #: SWM.SWP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-9

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

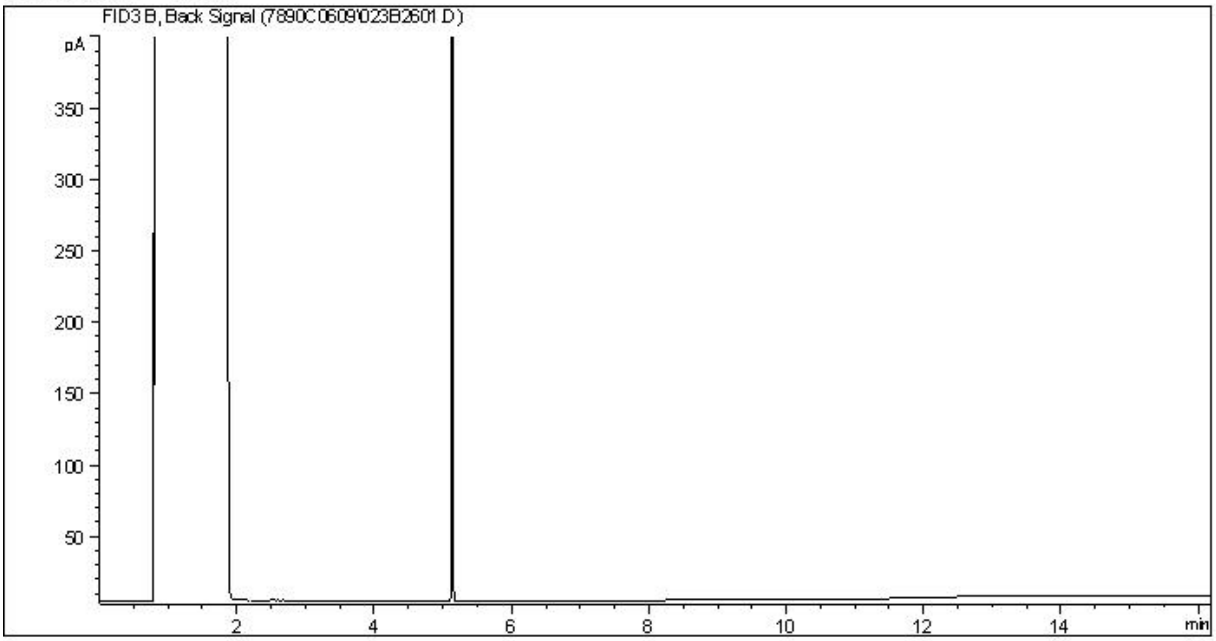
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744968
Report Date: 2017/06/16
Maxxam Sample: RF7902

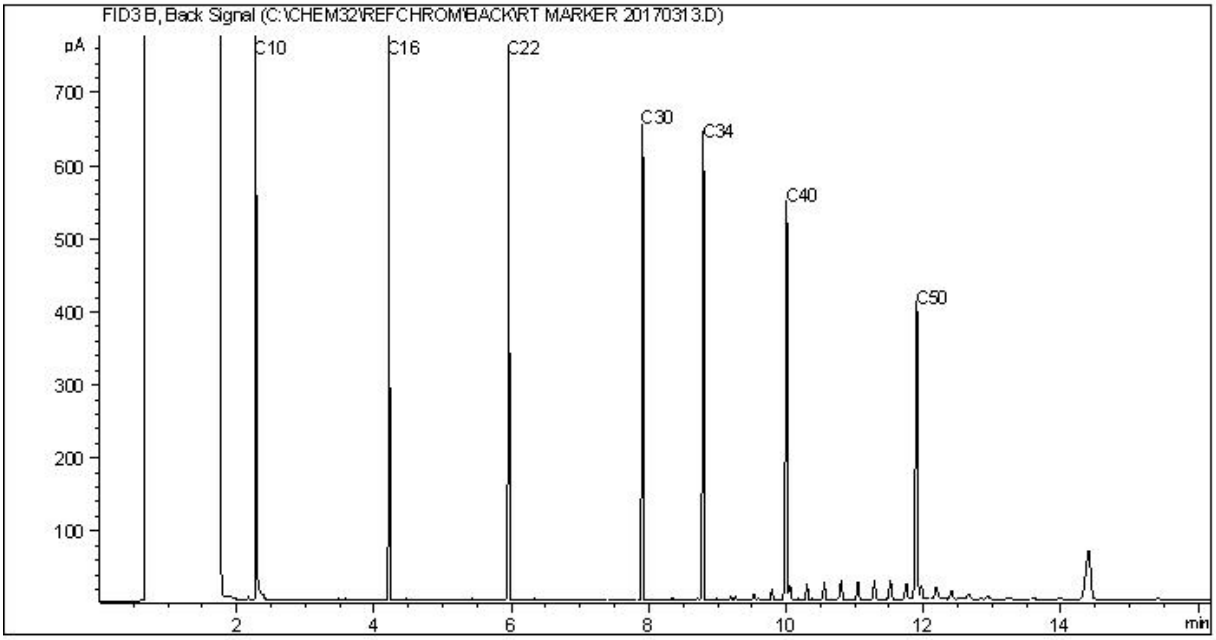
TETRA TECH CANADA INC.
Client Project #: SWM.SWP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-10

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

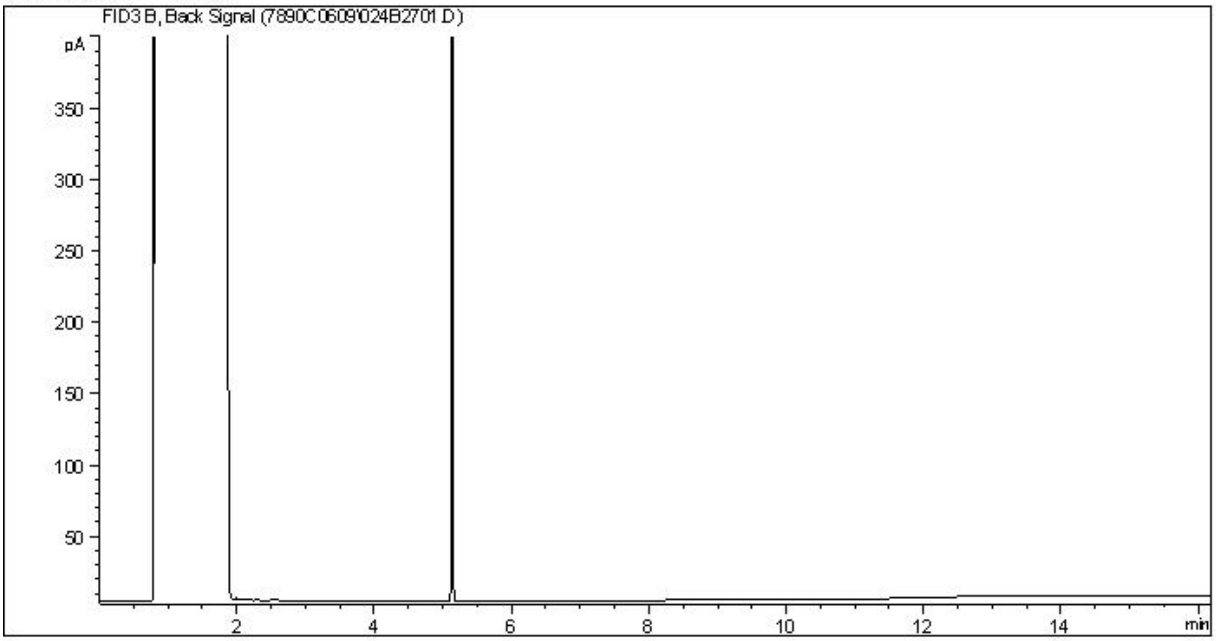
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744968
Report Date: 2017/06/16
Maxxam Sample: RF7903

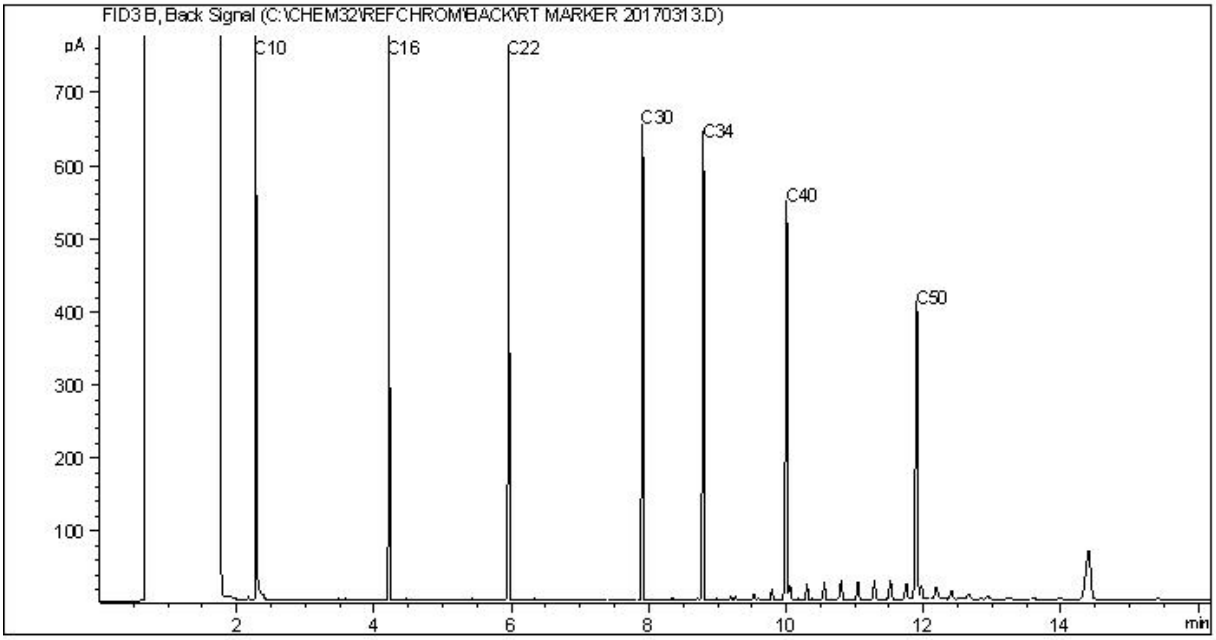
TETRA TECH CANADA INC.
Client Project #: SWM.SWP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-11

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

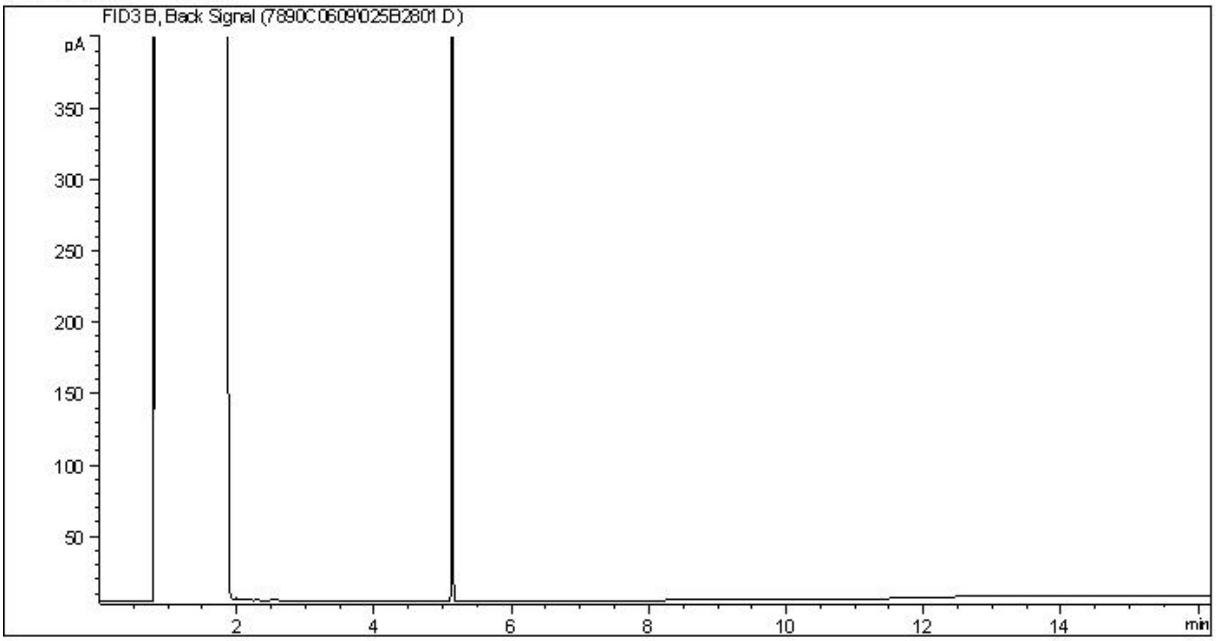
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B744968
Report Date: 2017/06/16
Maxxam Sample: RF7904

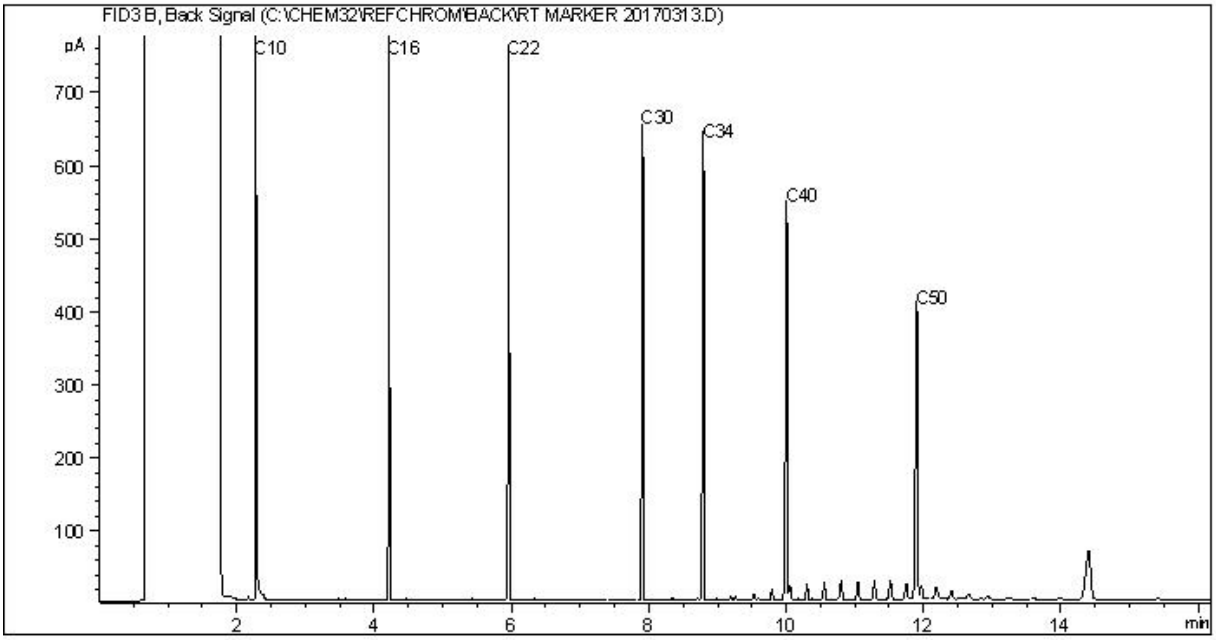
TETRA TECH CANADA INC.
Client Project #: SWM.SWP03652-01
Site Reference: RYLEY LANDFILL
Client ID: MW-14

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Ioana Stoica

From: Schmidt, Brent <Brent.Schmidt@tetratech.com>
Sent: June-08-17 3:14 PM
To: Ioana Stoica; Crawford, Michele
Subject: RE: TetraTech submission- M056731

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Ioana

My mistake. Please analyze all those samples as well for the same parameters. Sorry about that.

Brent Schmidt, B.Sc., Geol.I.T. | Hydrogeologist
Tetra Tech Canada | **Environment and Water Practice**

Business **587.460.3614** | Mobile **780.777.6000** | Fax **780.454.5688**
brent.schmidt@tetratech.com

From: Ioana Stoica [mailto:IStoica@maxxam.ca]
Sent: Thursday, June 08, 2017 3:12 PM
To: Crawford, Michele <Michele.Crawford@tetratech.com>; Schmidt, Brent <Brent.Schmidt@tetratech.com>
Subject: TetraTech submission- M056731

Hello Michele and Brent,

Can you please confirm if samples 5-10 for the submission listed below require analyses or just HOLD?

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CHAIN OF CUSTODY RECORD

M056731

Page 1 of 2

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company: Tetra Tech	Company:	Quotation #: B60546	[X] 5 - 7 Days Regular (Most analyses)
Contact Name: Michele Crawford	Contact Name:	P.O. #/ AFE#: EM.SWM03011-05.003	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 14940 123 Ave Edmonton, AB	Address:	Project #: EM.SWM03011-05.003	Rush TAT (Surcharges will be applied): [ ] Same Day [ ] 2 Days [ ] 1 Day [ ] 3-4 Days
Phone: 780.451.2121	Phone:	Site Location: Ryley Landfill	Date Required:
Email: Michele.Crawford@tetratech.com	Email:	Site #:	Rush Confirmation #:
Copies: Brent.Schmidt@tetratech.com	Copies:	Sampled By: RS	

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓				
Seal Intact		✓	Temp	4	5	9
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present		✓				
Seal Intact		✓	Temp	8	9	7
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present		✓				
Seal Intact		✓	Temp	4	11	9
Cooling Media	✓					

Depot Reception

Analysis Requested

Regulatory Criteria

[ ] AT1
[ ] CCME
[ ] Drinking Water
[ ] D50 (Drilling Waste)
[ ] Saskatchewan
[ ] Other:

Special Instructions

16MW09A, 16MW11A, 16MW11D } not Filtered or Preserved

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 [ ] VOC [ ]	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals [X] Diss [X] Tot	Mercury [X] Dissolved [X] Total	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	Ammonia-N (total)	TKN + COD	(carbon (DOC)	HOLD - DO NOT ANALYZE
1	16MW04		2017/06/07	9:00	water	9		X		X	X X	X					X	X	X	
2	16MW08A			1000		9		X		X	X X	X					X	X	X	
3	16MW08B			1020		9		X		X	X X	X					X	X	X	
4	16MW09A			1110		8		X		X	X X	X					X	X	X	
5	16MW09B			815		9														
6	16MW09C			835		9														
7	~~16MW08B~~ 16MW11A			1135		9														
8	16MW11B			1200		9														
9	16MW11C			1215		9														
10	16MW11D		↓	1230	↓	9														
	Please indicate Filtered, Preserved or Both (F, P, F/P)							P			F/P F/P						P	P	F/P	

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Brent Schmidt	2017/06/07	1535	JOSH KOWALSKY	2017/06/09	15:35	

Thank you,
IOANA STOICA, B.Sc, M.Sc
Senior Project Manager –Alberta
istoica@maxxam.ca
Office 403 735 2227
Toll free 800 386 7247 / Fax 403 735 2240

My regular office hours are:
Monday – Friday : 07:30AM - 04:00PM

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SUMMER HOURS START SUNDAY MAY 14, 2017
Sample Reception Hours: Mon-Fri 8am-8pm, Sat/Sun 9am-5pm
Office Hours: Mon-Fri 8am-5pm
NOTE: We will be CLOSED on Monday May 22 for Victoria Day.

For urgent customer service inquiries after hours, please contact our on call project managers at **403 651 2436 for Calgary** and **780 722 8050 for Edmonton.**

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CHAIN OF CUSTODY RECORD

355
M056731

Page 1 of 2

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company: Tetra Tech	Company:	Quotation #: B60546	[X] 5 - 7 Days Regular (Most analyses)
Contact Name: Michele Crawford	Contact Name:	P.O. #/ AFE#: ENV.SWM03011-05.003	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 14940 123 Ave Edmonton, AB	Address:	Project #: ENV.SWM03011-05.003	Rush TAT (Surcharges will be applied): [ ] Same Day [ ] 2 Days [ ] 1 Day [ ] 3-4 Days
Phone: 780.451.2121	Phone:	Site Location: Ryley Landfill	Date Required:
Email: Michele.Crawford@tetratech.com	Email:	Site #:	Rush Confirmation #:
Copies: Brent.Schmidt@tetratech.com	Copies:	Sampled By: RS	

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		-				
Seal Intact		-	Temp	4	5	9
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present		-				
Seal Intact		✓	Temp	8	9	7
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present		-				
Seal Intact		✓	Temp	4	11	9
Cooling Media	✓					

Depot Reception

Analysis Requested

#	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☐	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals ☒ Diss ☐ Tot	Mercury ☒ Dissolved ☐ Total	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	Ammonia-N (total)	TKN + COD	(carbon (DOC)	HOLD - DO NOT ANALYZE
1	16MW04		2017/06/07	9:00	water	9		X		X	X	X					X	X	X	
2	16MW08A			1000		9		X		X	X	X					X	X	X	
3	16MW08B			1020		9		X		X	X	X					X	X	X	
4	16MW09A			1110		8		X		X	X	X					X	X	X	
5	16MW09B			815		9														
6	16MW09C			835		9														
7	~~16MW11D~~ 16MW11A			1135		9														
8	16MW11B			1200		9														
9	16MW11C			1215		9														
10	16MW11D		↓	1230	↓	9														
	Please indicate Filtered, Preserved or Both (F, P, F/P)							P			F/P	F/P					P	P	F/P	

Regulatory Criteria

- [ ] AT1
- [ ] CCME
- [ ] Drinking Water
- [ ] D50 (Drilling Waste)
- [ ] Saskatchewan
- [ ] Other:

Special Instructions

16MW09A, 16MW11A, 16MW11D } not Filtered or Preserved

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Brent Schmidt	2017/06/07	1535	JOSH KNISBURY	2017/06/07	15:35	B745326

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AB FCD-00331/7

355

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Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
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CHAIN OF CUSTODY RECORD

M 013274

Report Information

Company: SAME
Contact:
Phone: AS
Email: PAGE 1
Sampled by:

Comments

Analysis Requested

Same as CoC

Project/LSD

Special Instructions

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☐	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals Tot ☐ Diss ☒	Mercury Total ☐ Dissolved ☐	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	Ammonia-N (total)	TKN + COD	Carbon (DOC)	HOLD - DO NOT ANALYZE
11	~~16MW13~~ 16MW13		2017/06/07	920	water	9		X		X	X	X					X	X	X	
12	16MW14			940		9		X		X	X	X					X	X	X	
13	16MW16			1045		9		X		X	X	X					X	X	X	
14	16MW18			1250		9		X		X	X	X					X	X	X	
15	175 Duplicate 1		↓		↓	9		X		X	X	X					X	X	X	
16																				
17																				
18																				
19																				
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24																				
25																				
26																				
27																				
28																				
29																				
30																				

Please indicate Filtered, Preserved or Both (F, P, F/P) →

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Brent Schmidt	2017/06/07	1535	Josh Kwasbury	2017/06/07	15:35	B745326

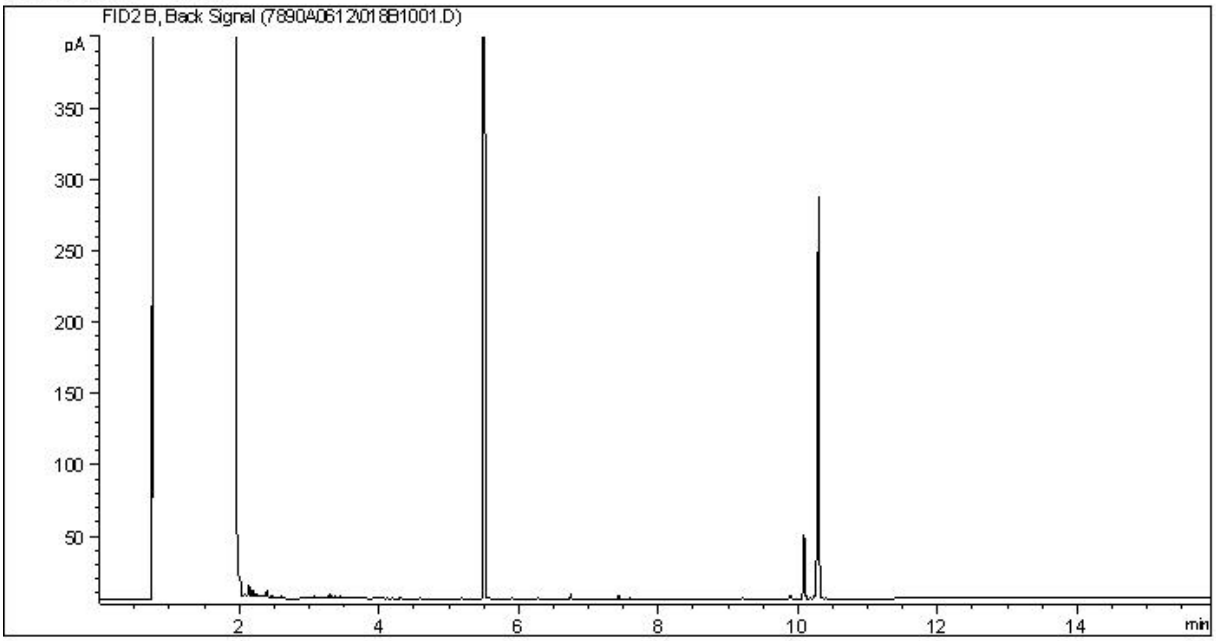
AB FCD-00331/6

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0000

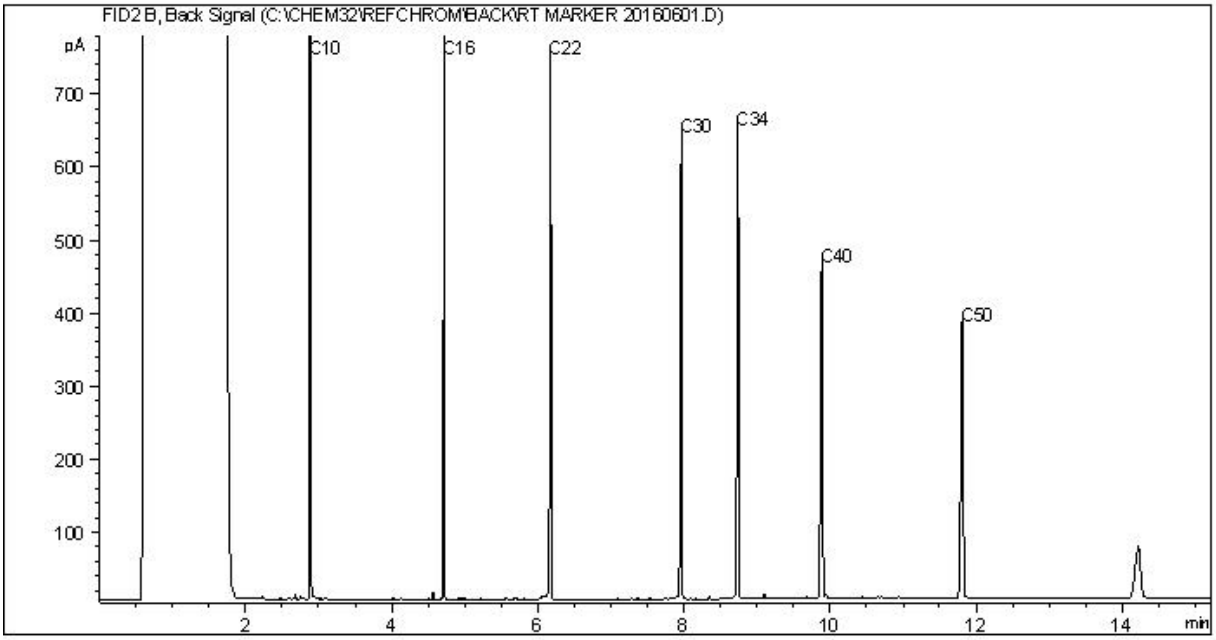
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW04

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

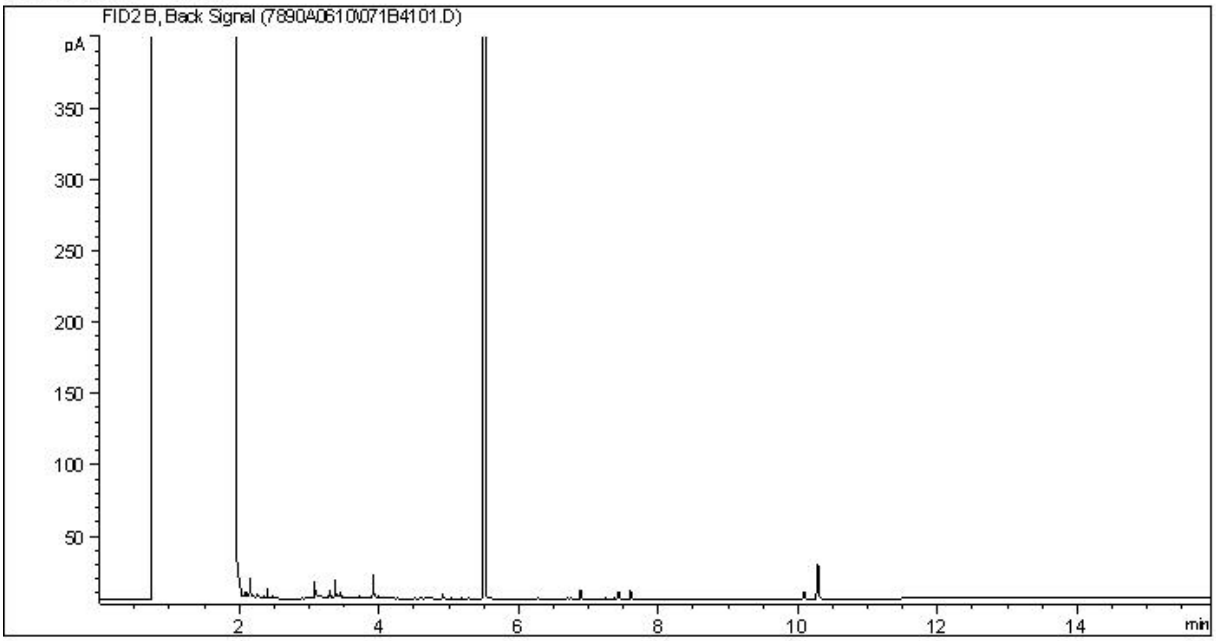
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0000 Lab-Dup

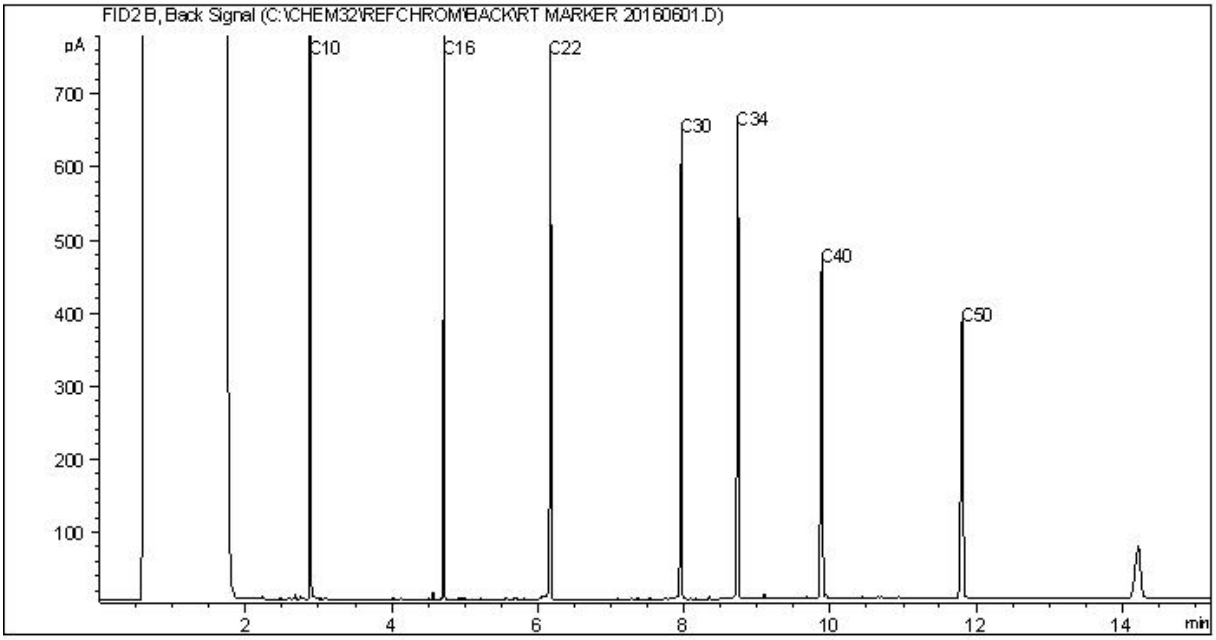
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW04

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

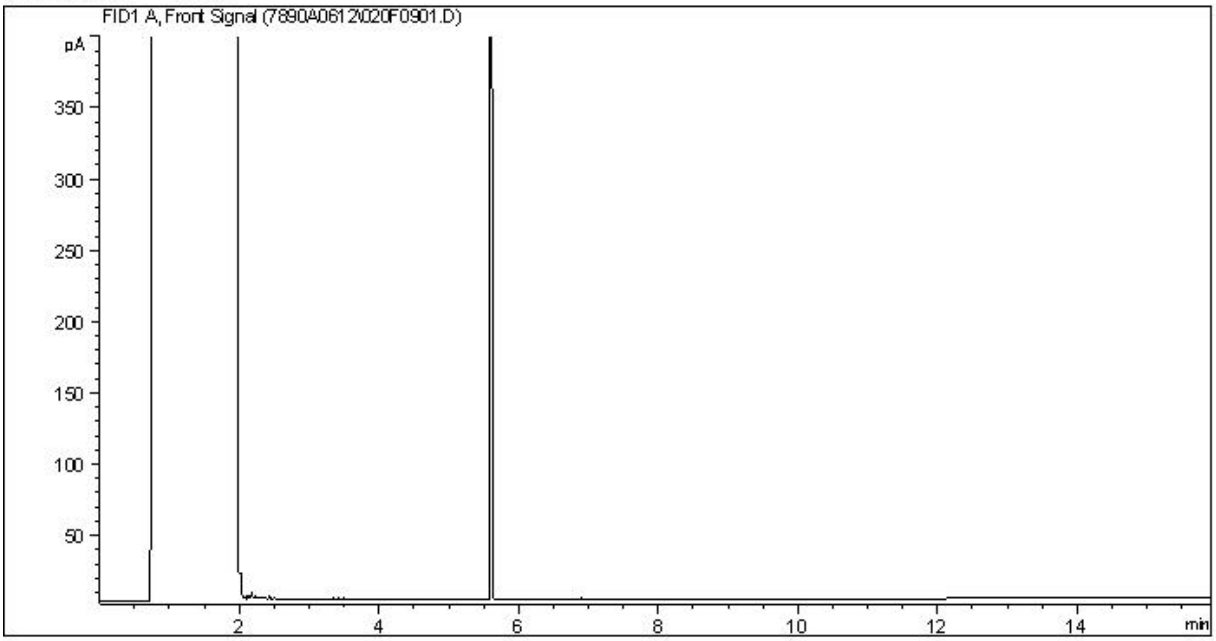
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0001

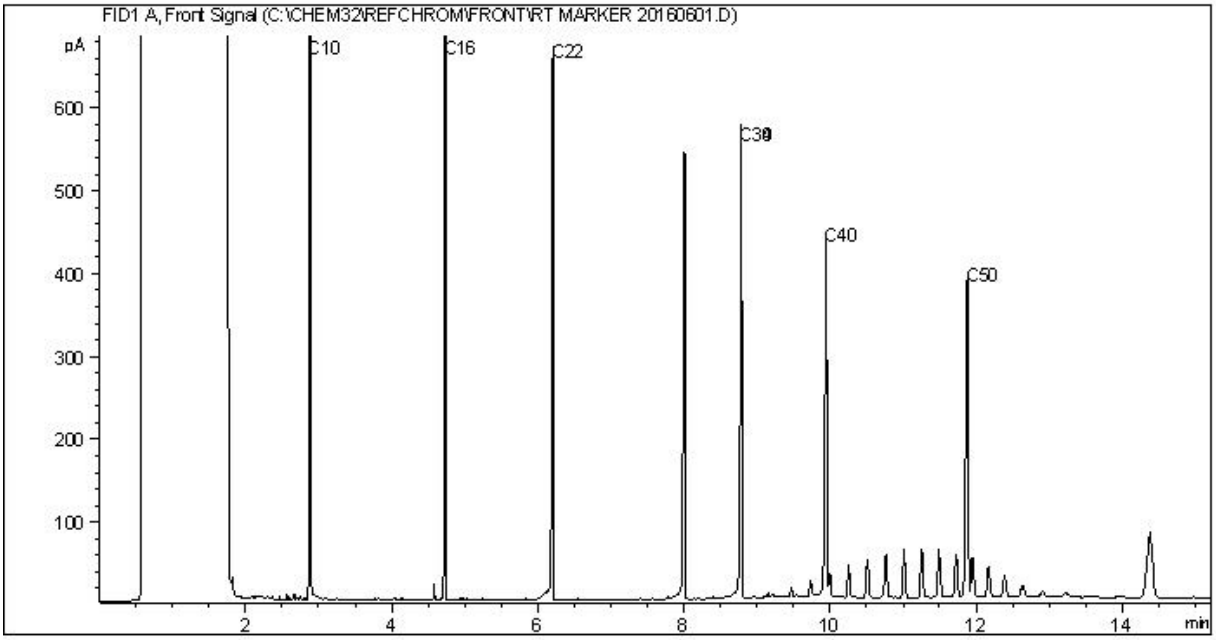
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW08A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

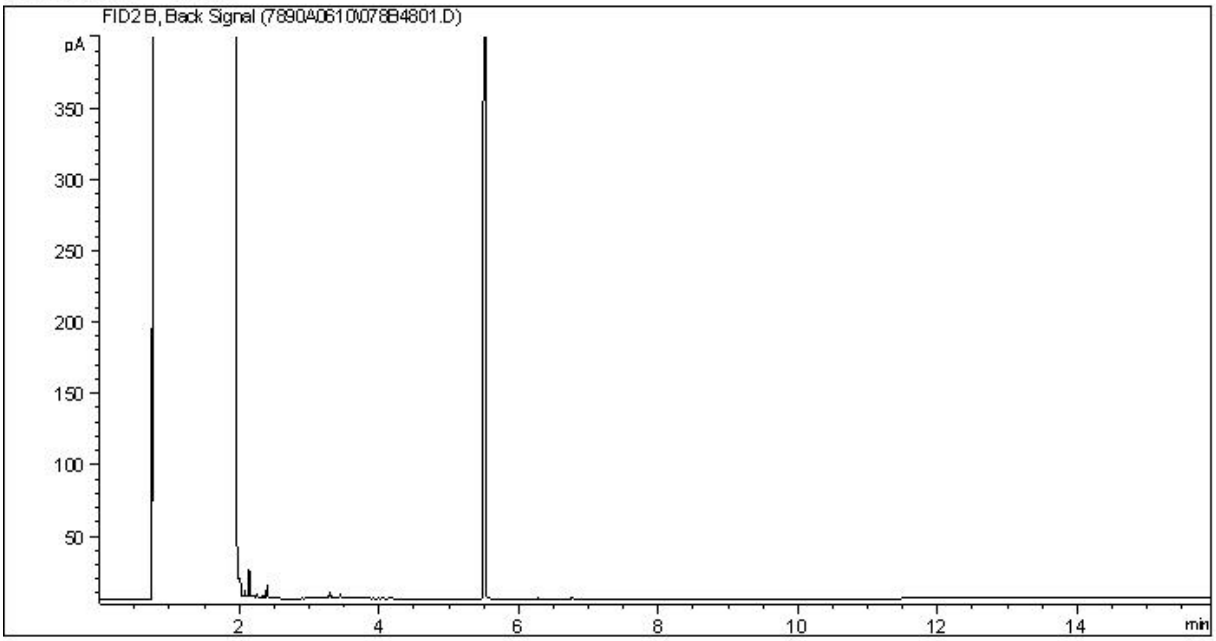
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0002

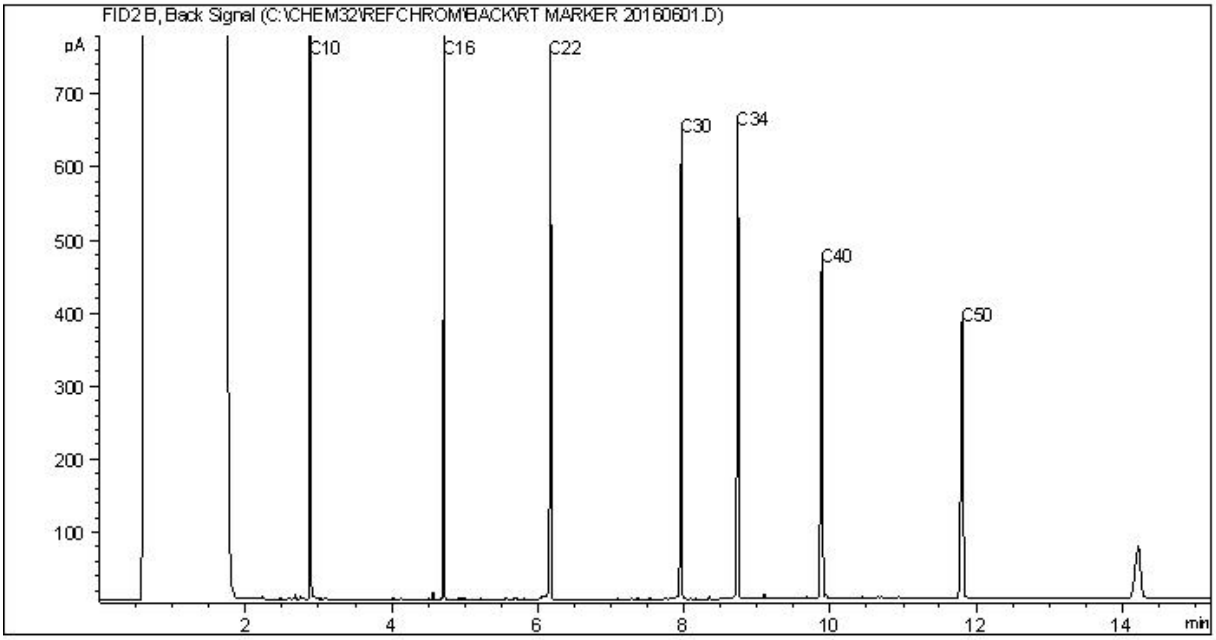
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW08B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

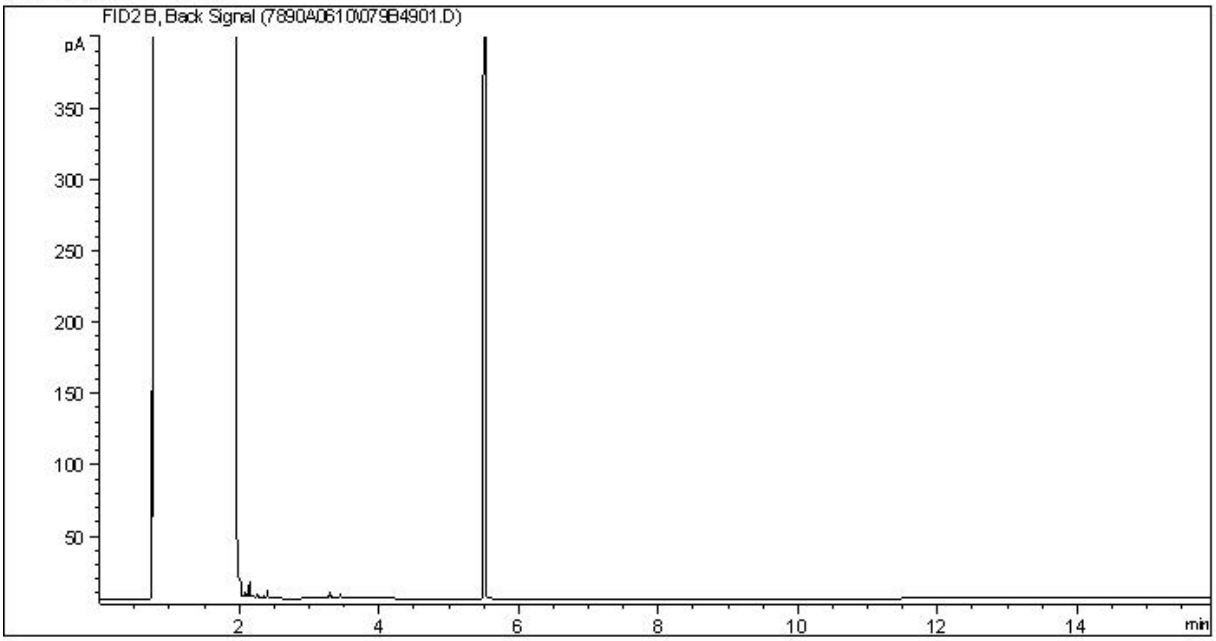
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0003

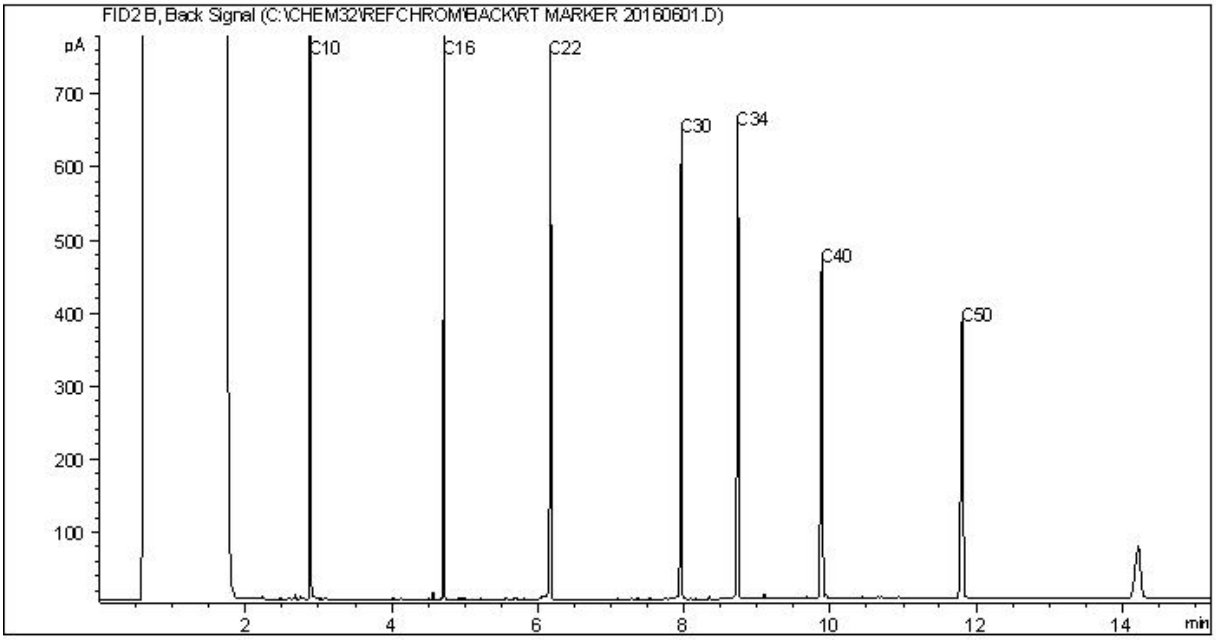
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW09A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

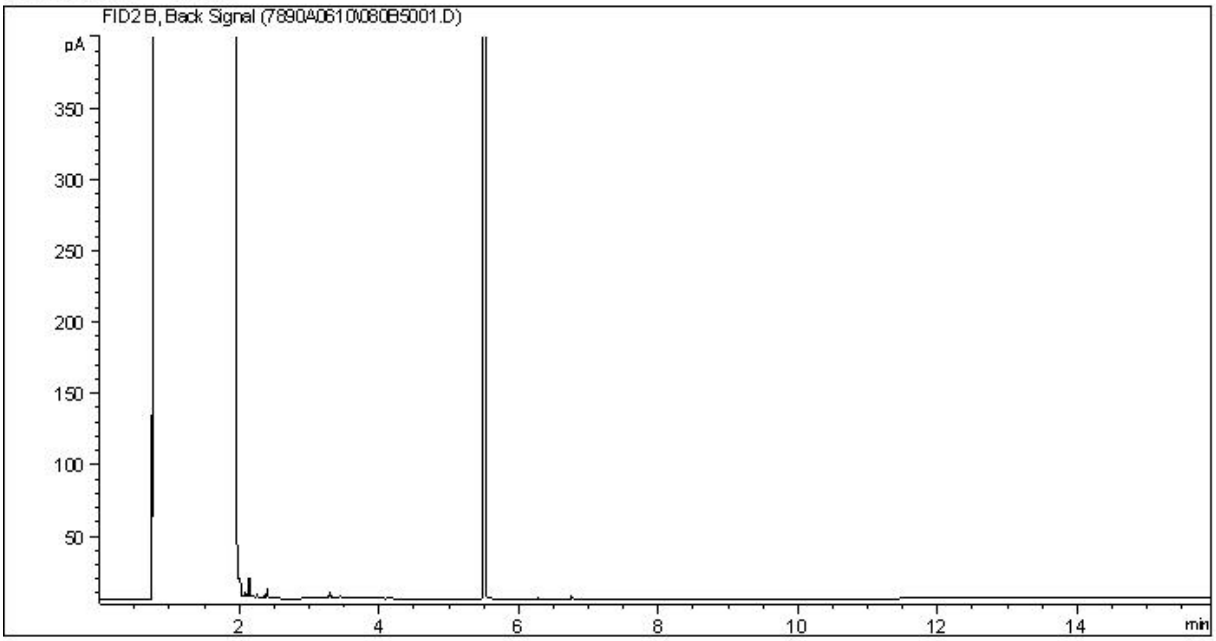
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0004

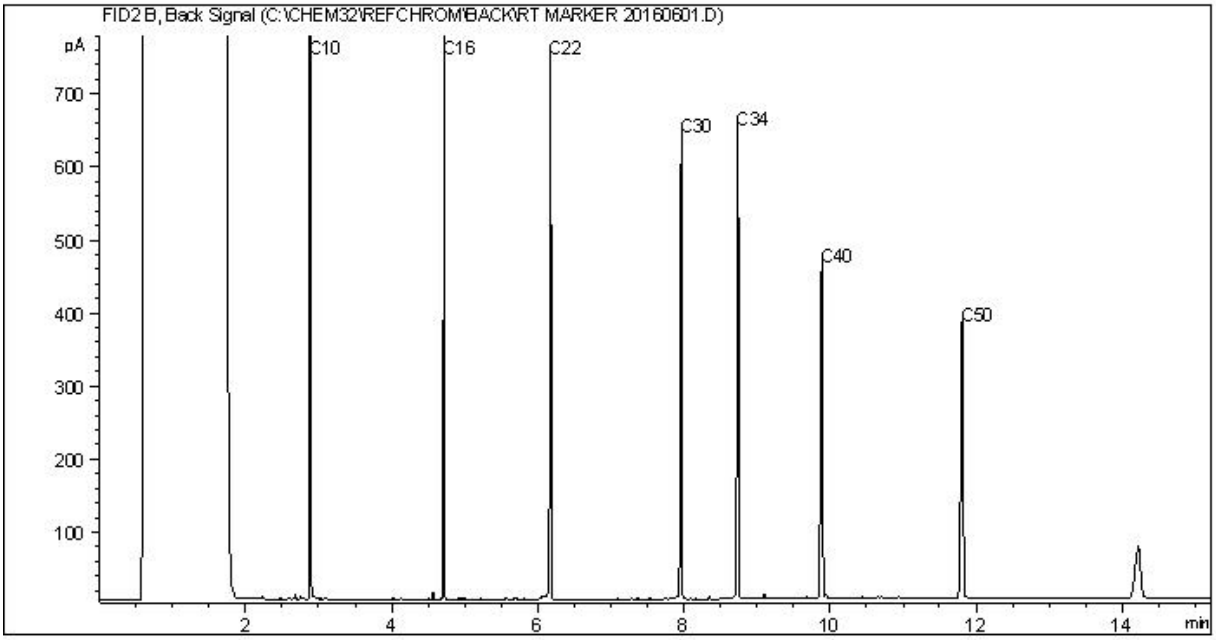
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW09B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

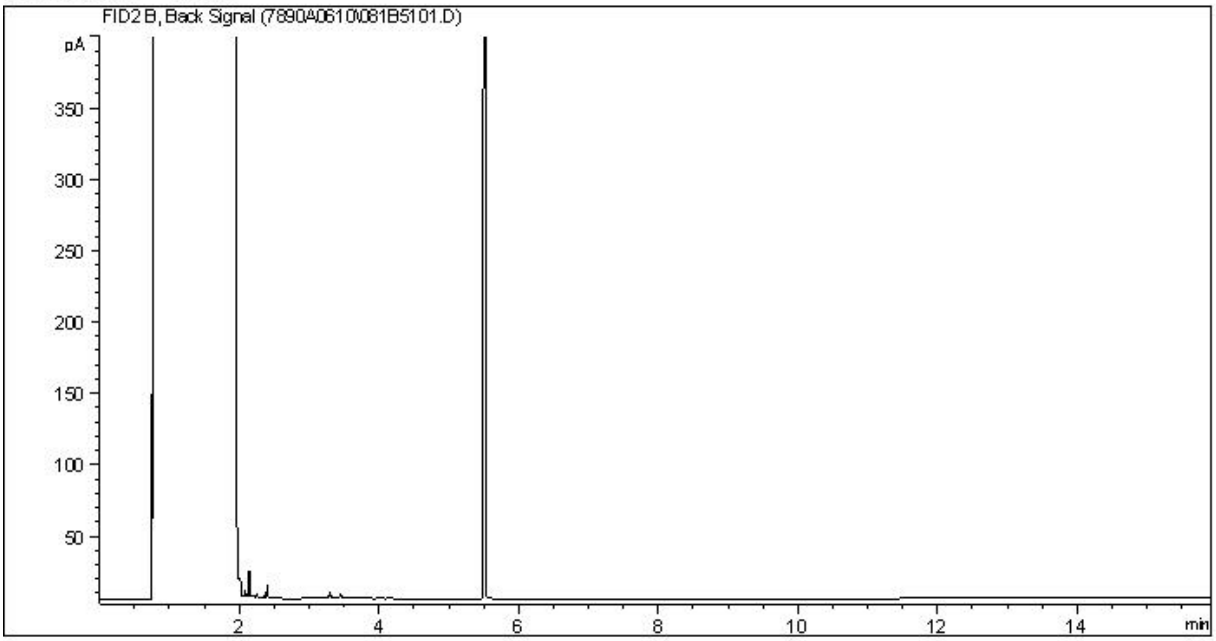
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0005

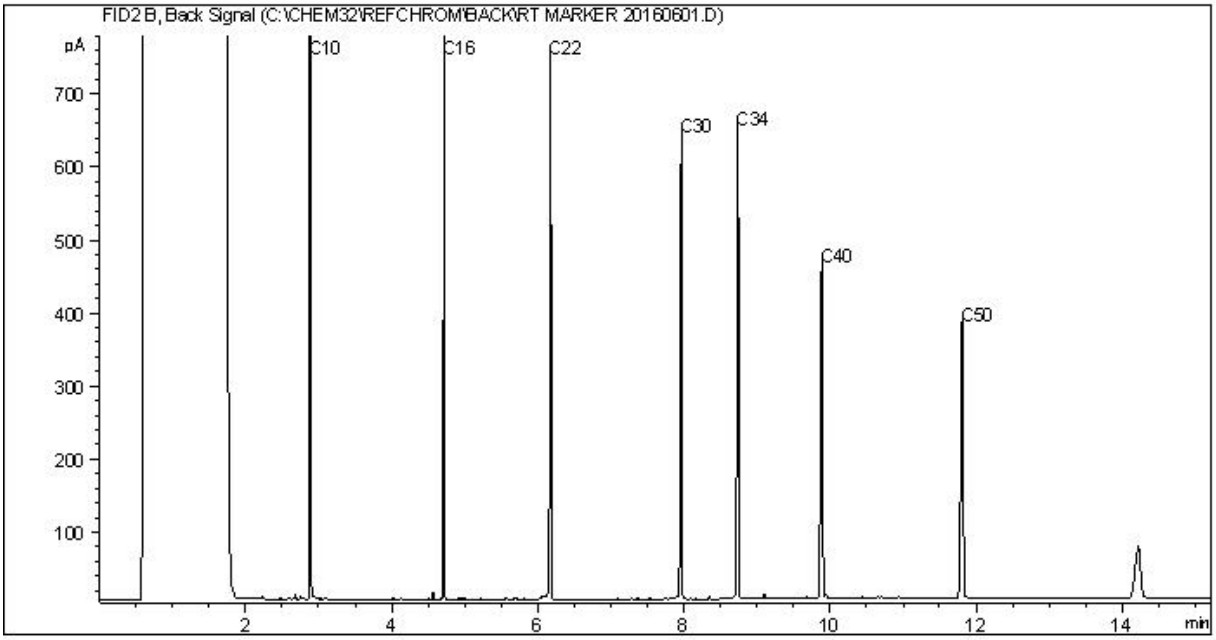
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW09C

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

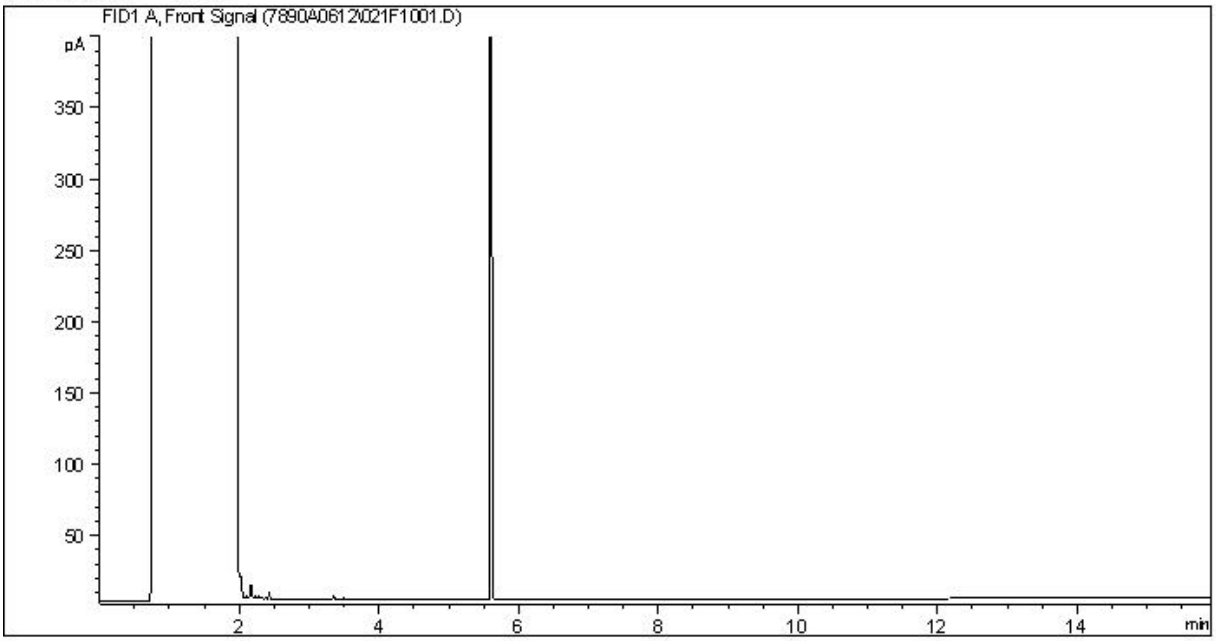
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0006

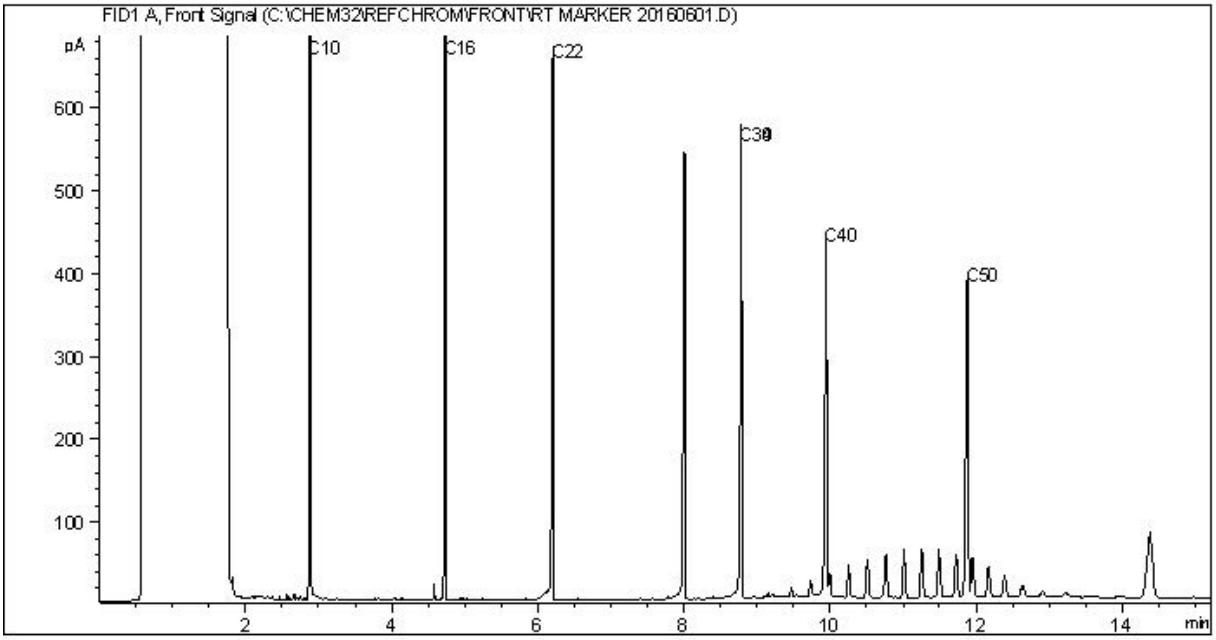
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW11A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

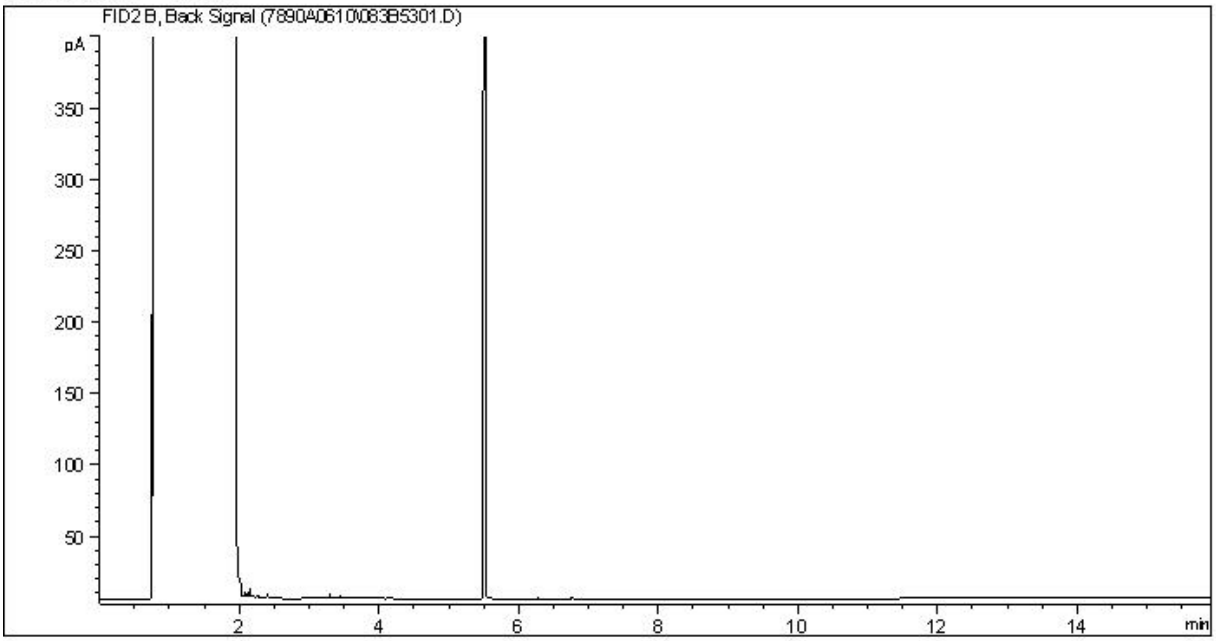
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0007

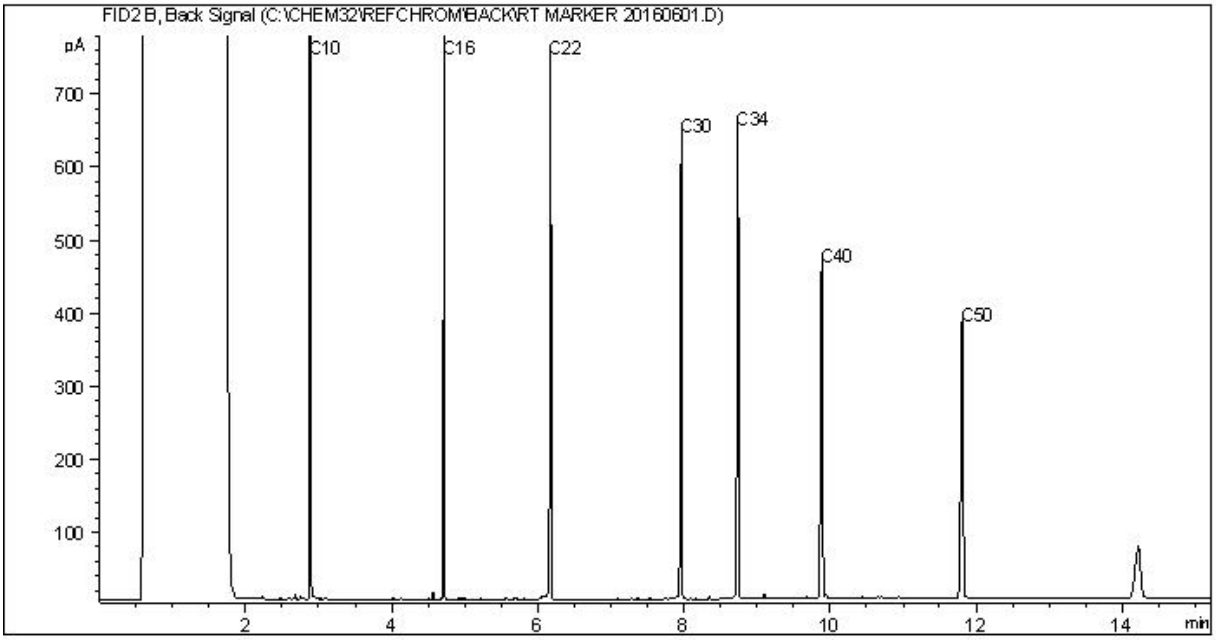
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW11B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

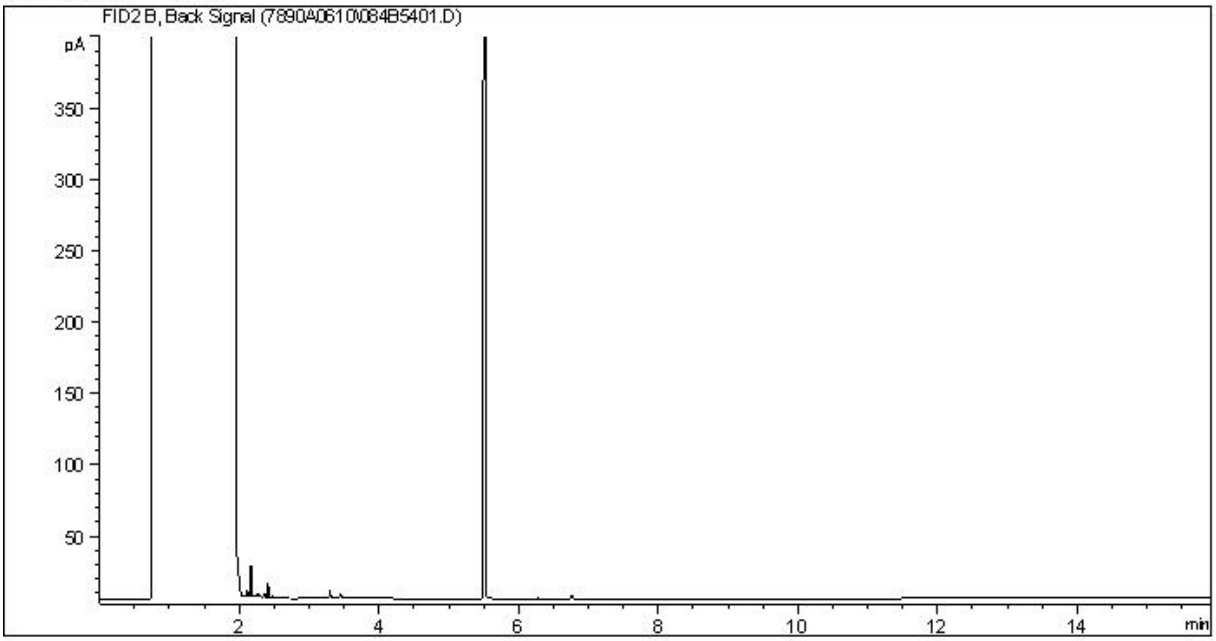
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0008

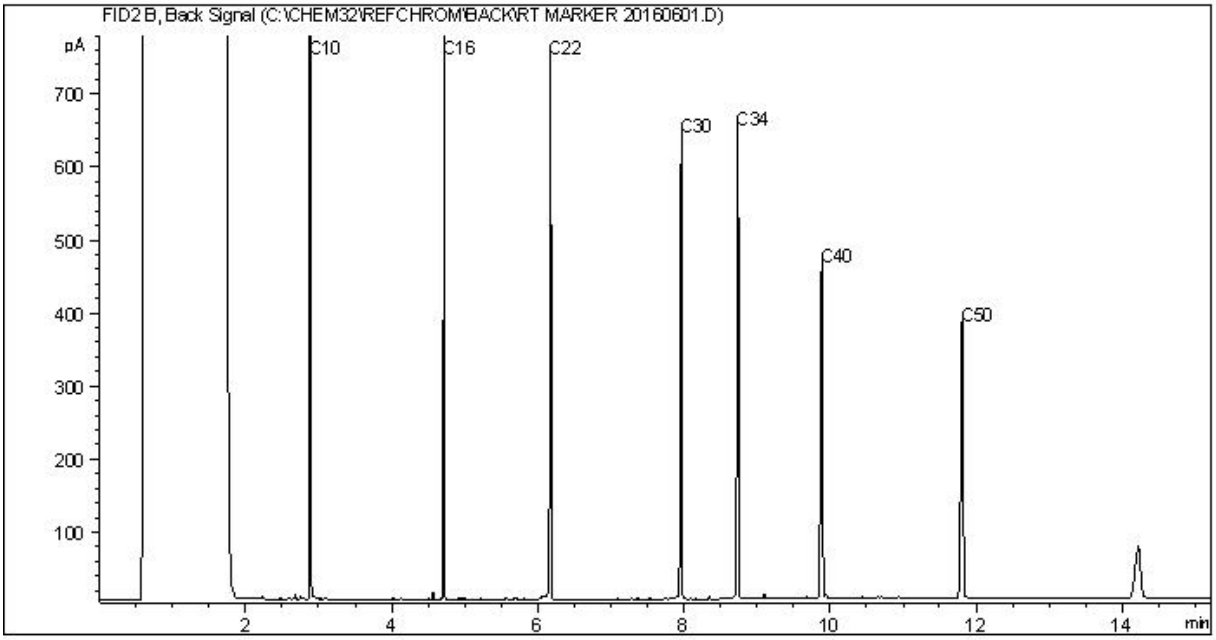
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW11C

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

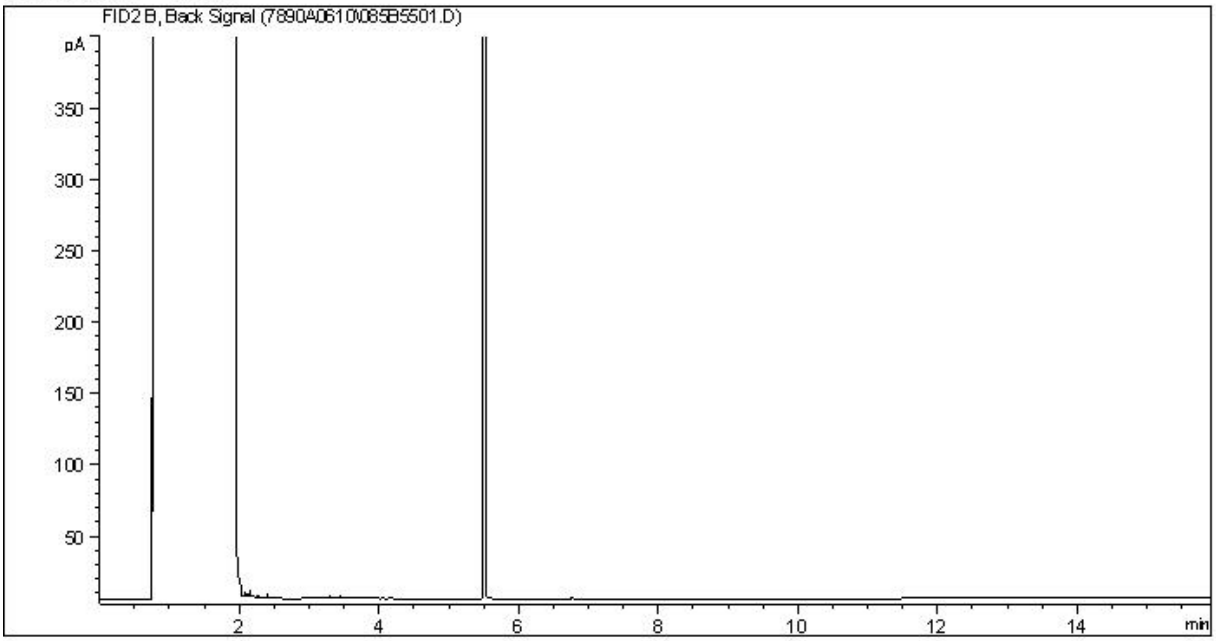
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0009

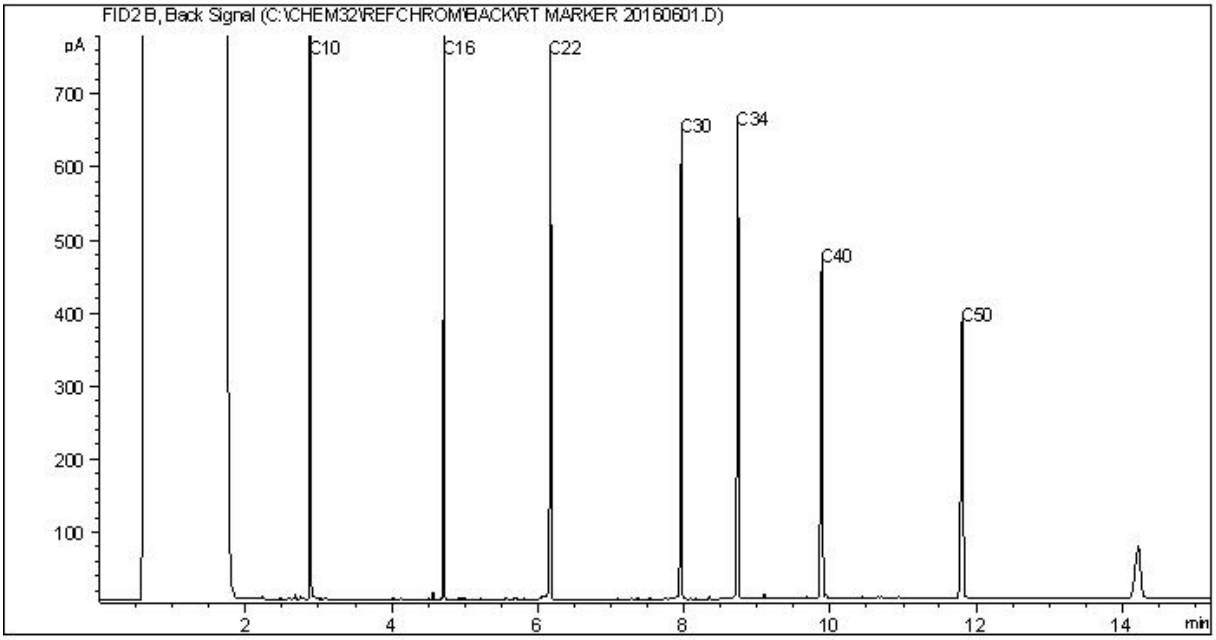
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW11D

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

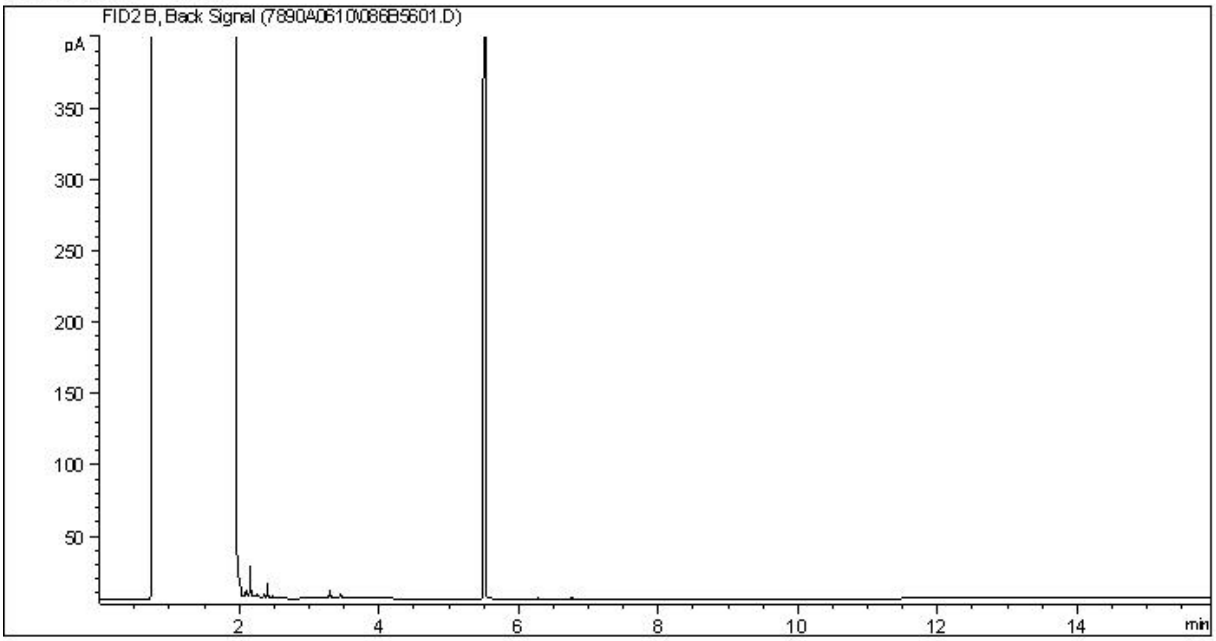
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0013

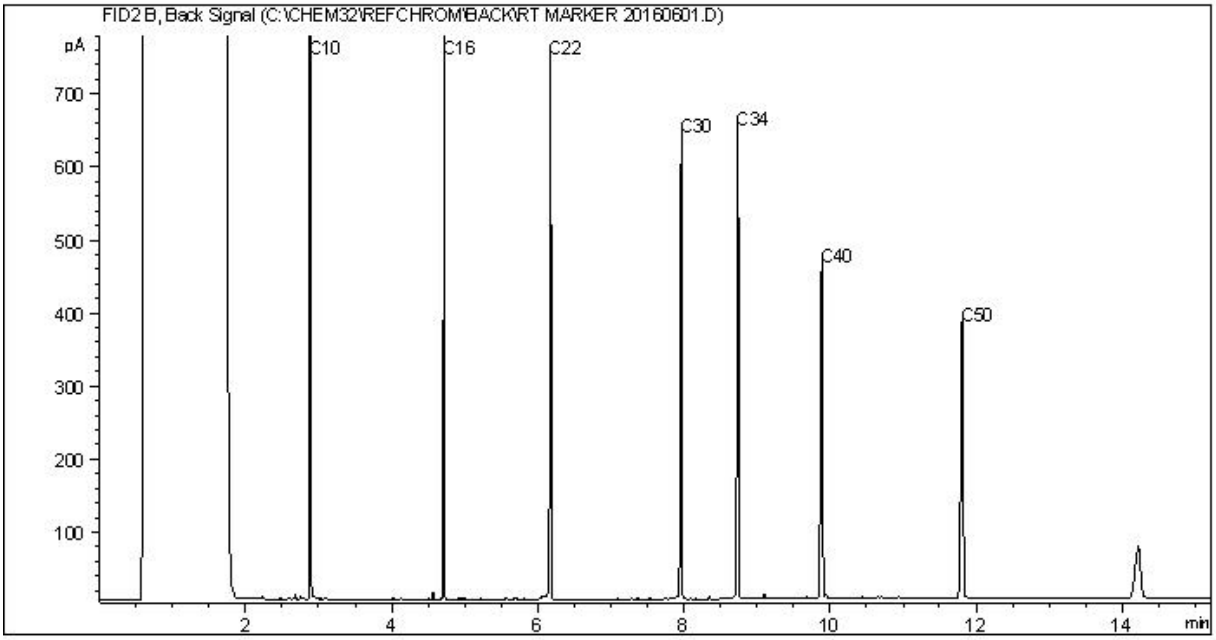
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW13

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

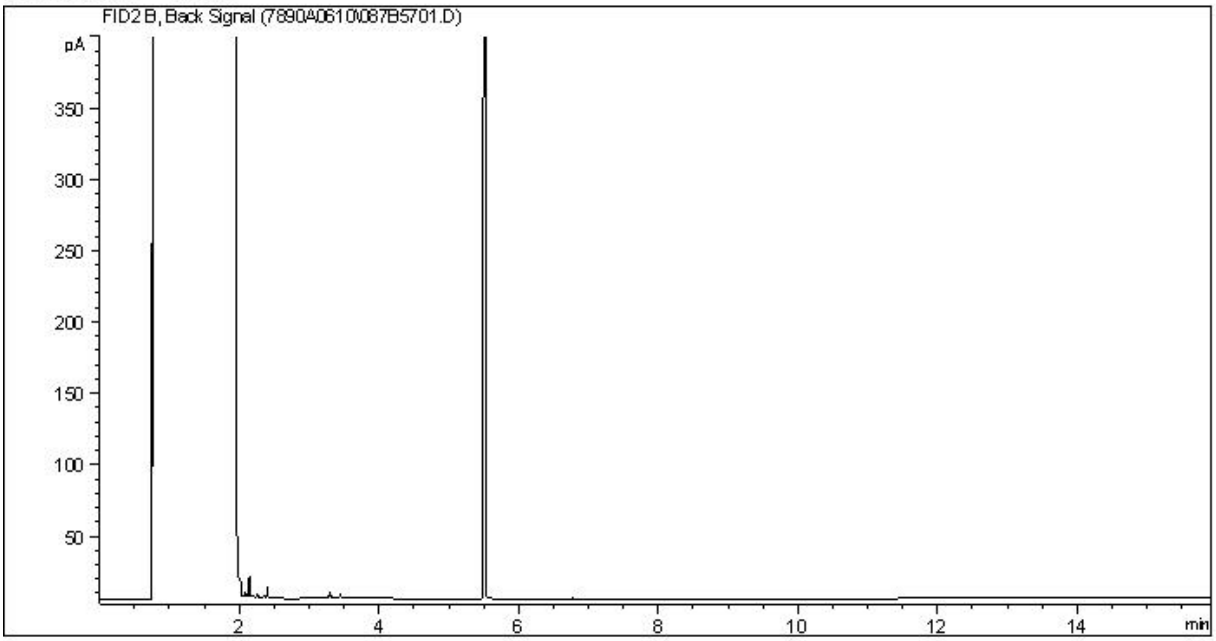
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0014

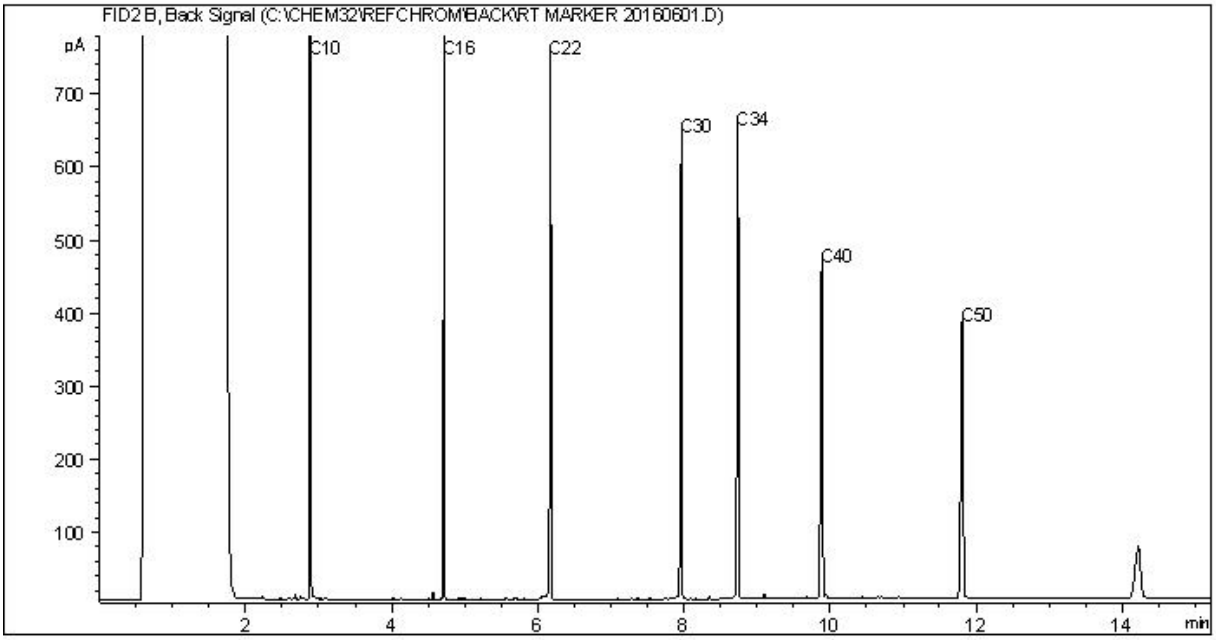
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW14

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

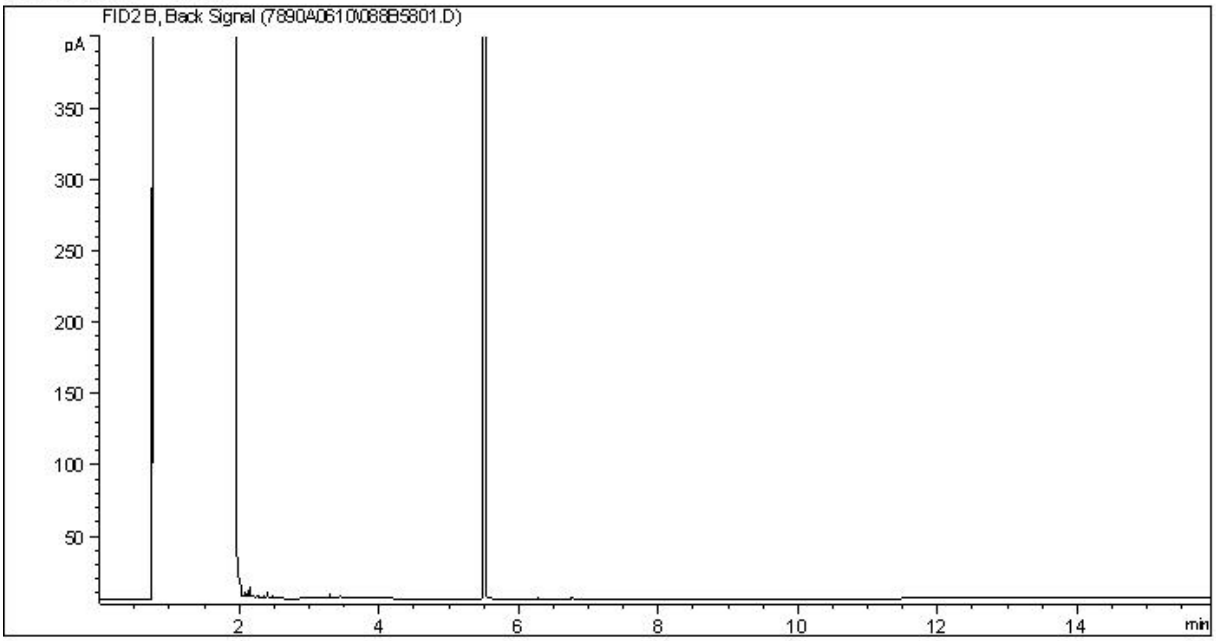
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0015

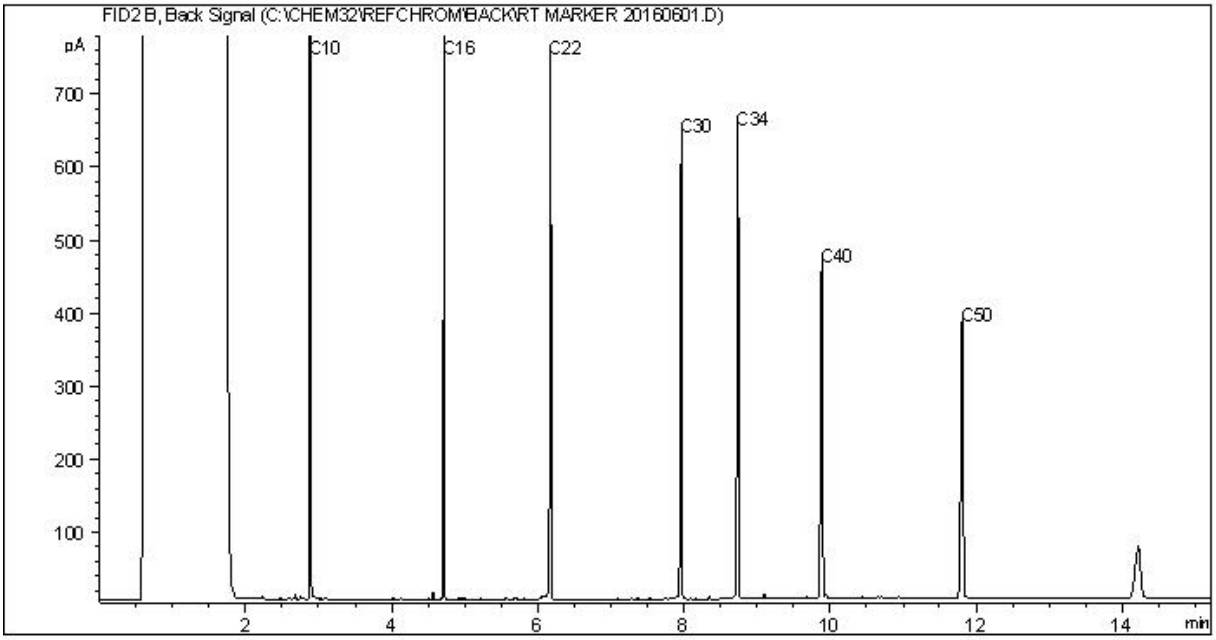
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW16

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

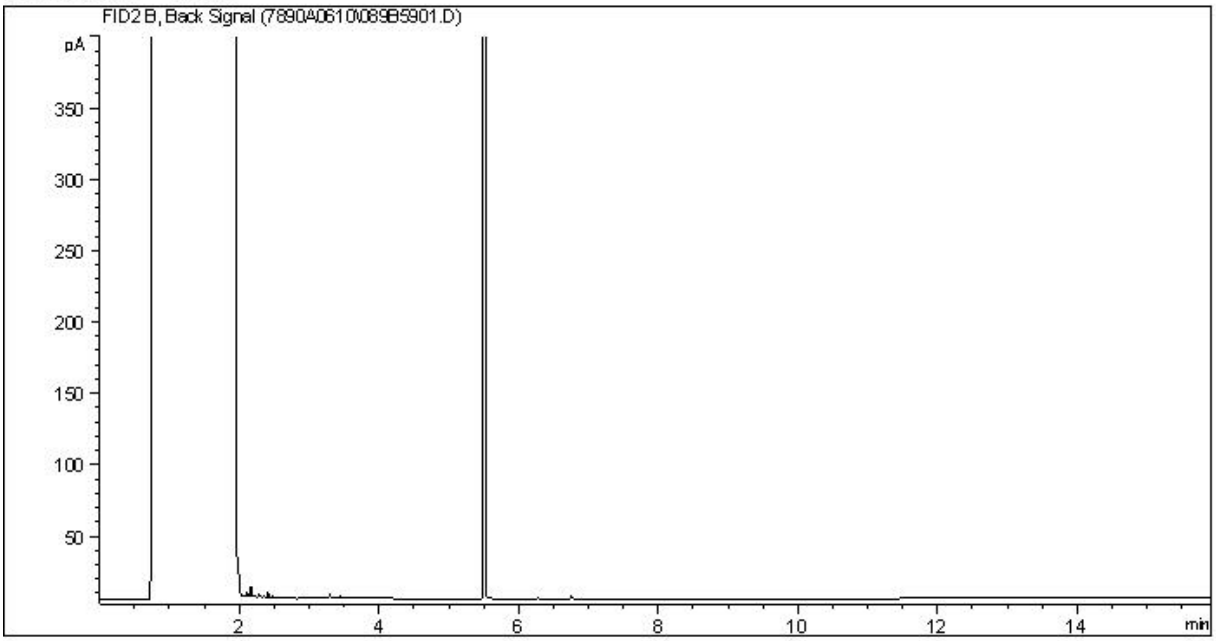
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0016

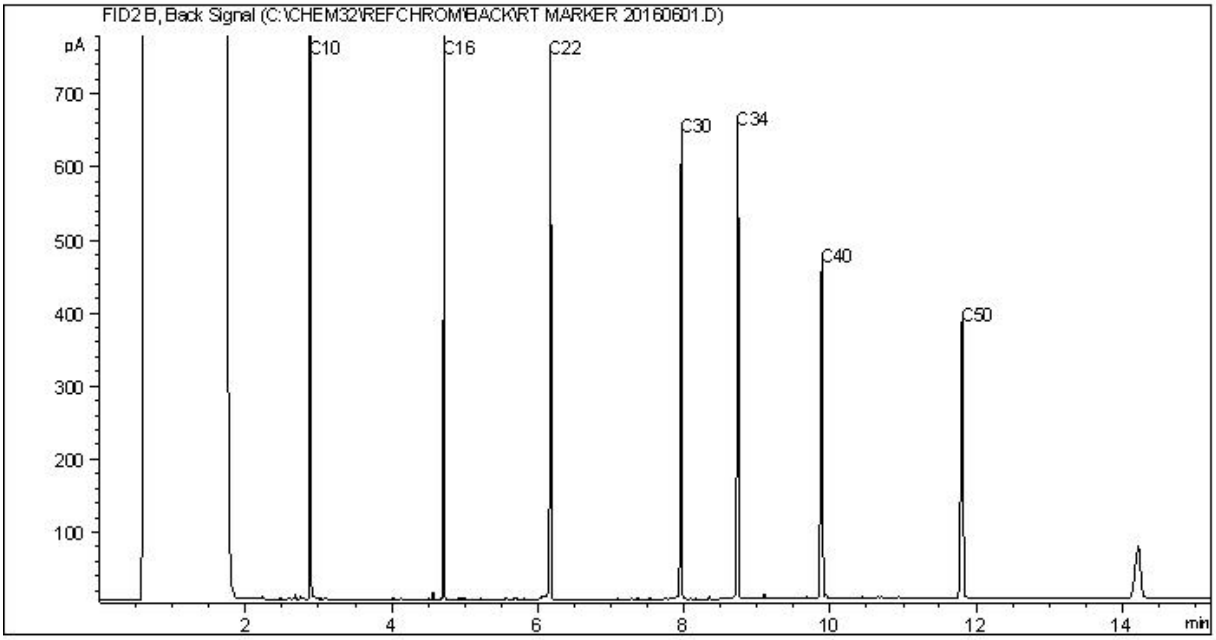
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 16MW18

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

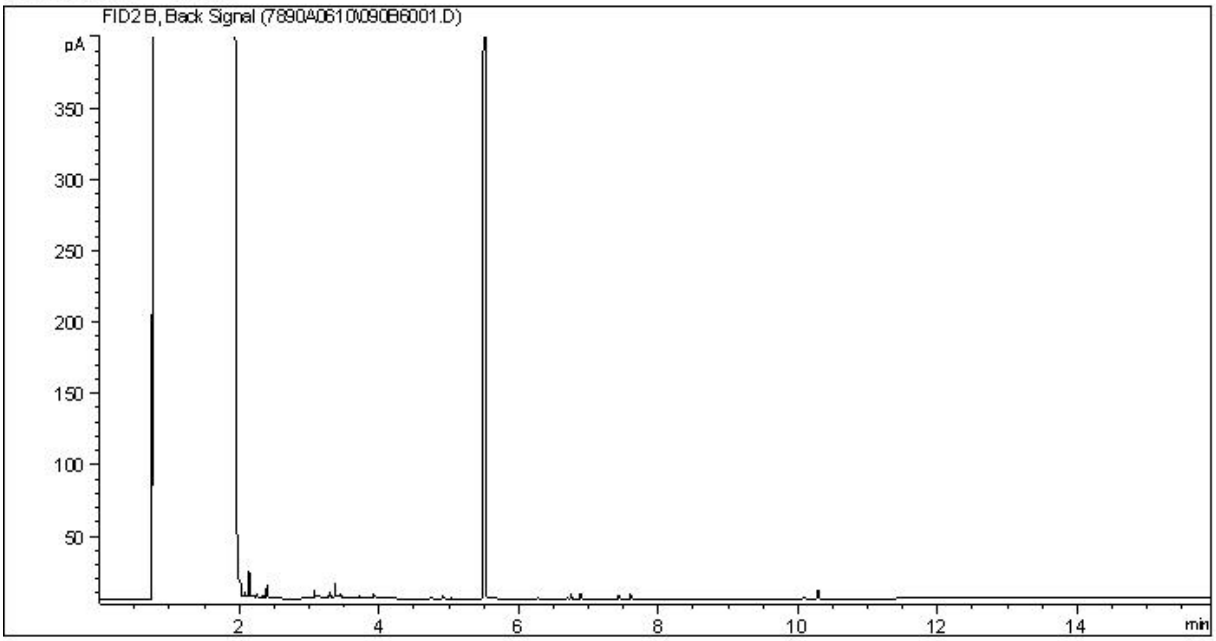
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B745326
Report Date: 2017/06/16
Maxxam Sample: RG0017

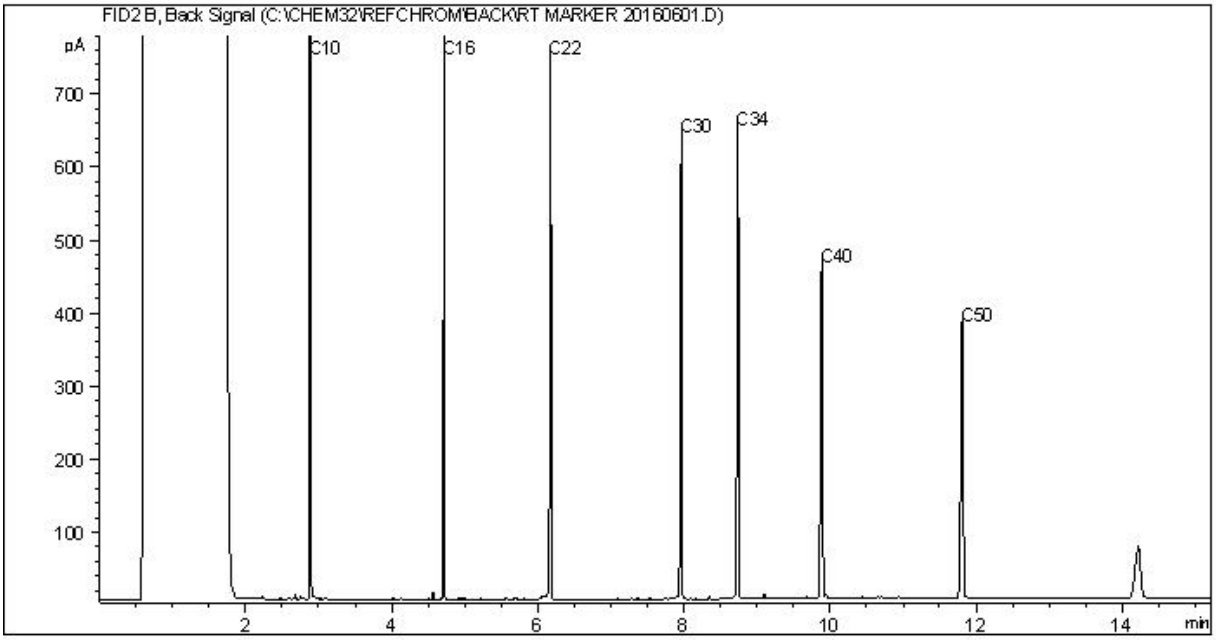
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03665-01
Site Reference: RYLEY LANDFILL
Client ID: 175DUPLICATE1

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890A



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Forkheim, Carl

Subject: FW: Chemistry results - Double check

From: Ioana Stoica [mailto:IStoica@maxxam.ca]
Sent: Tuesday, July 04, 2017 11:38 AM
To: Schmidt, Brent <Brent.Schmidt@tetratech.com>; Forkheim, Carl <Carl.Forkheim@tetratech.com>
Subject: RE: Chemistry results - Double check

Hello Brent, Carl,

Thank you for your patience while we finalized this investigation for you.

You requested to have the following samples and parameters rechecked due to high RPD for field duplicates:

Sample MW-22B (RE9045) and duplicate 17DUP1 (RE9062) – Cu
Sample MW-26B (RE9049) and duplicate 17DUP2 (RE9063) – IB and Cu
Sample MW-28B (RE9053) and duplicate 17DUP3 (RE9064) – IB and Cu

The lab has manually calculated the ion balances for above mentioned samples and they confirmed to be correct.
The raw data for Cu has been checked and no issues detected. Upon re-analyses, the original results have been confirmed. New data will not be available for this submission.

Please let us know if there are other questions or concerns.

Ioana

IOANA STOICA, B. Sc., M. Sc
Environmental Project Manager -Senior - Calgary
istoica@maxxam.ca
Office 403 735 2227
Toll free 800 386 7247 / Fax 403 735 2240

My regular office hours are:

Monday - Friday: 07:30AM- 04:00PM
Maxxam Analytics - A Bureau Veritas Group Company
Success Through Science®. maxxam.ca

SUMMER HOURS START SUNDAY MAY 14, 2017
Sample Reception Hours: Mon-Fri 8am-8pm, Sat/Sun 9am-5pm
Office Hours: Mon-Fri 8am-5pm
NOTE: We will be CLOSED on Monday July 3rd for Canada Day.

Couriers are not delivering or picking up on July 1st, 2nd or 3rd.

For urgent customer service inquiries after hours, please contact our on call project managers at **403 651 2436 for Calgary** and **780 722 8050 for Edmonton.**

From: Schmidt, Brent [mailto:Brent.Schmidt@tetratech.com]
Sent: June-27-17 3:20 PM
To: Ioana Stoica; Forkheim, Carl
Subject: RE: Chemistry results - Double check

Hi Ioana, here's the info

Lab job number B743380

Sample MW-22B (RE9045) and duplicate 17DUP1 (RE9062) – high Copper RPD
Sample MW-26B (RE9049) and duplicate 17DUP2 (RE9063) – high Ion Balance RPD and Copper RPD
Sample MW-28B (RE9053) and duplicate 17DUP3 (RE9064) – high Ion Balance RPD and Copper RPD

Regards
Brent

Brent Schmidt, B.Sc., Geol.I.T. | Hydrogeologist
Tetra Tech Canada | **Environment and Water Practice**

Business **587.460.3614** | Mobile **780.777.6000** | Fax **780.454.5688**
brent.schmidt@tetratech.com
please consider the environment before printing this email

From: Ioana Stoica [mailto:IStoica@maxxam.ca]
Sent: Tuesday, June 27, 2017 1:26 PM
To: Forkheim, Carl <Carl.Forkheim@tetratech.com>
Cc: Schmidt, Brent <Brent.Schmidt@tetratech.com>
Subject: RE: Chemistry results - Double check

Hello Carl,

Thank you for your email.

I was wondering if it's possible for you to get a summary of the job numbers, sample IDs and parameters you would like to have check for each submission along with the reason for the check? Could you also provide us with the information for the duplicate samples so we can have the RDP calculated.

I will be out of the office tomorrow and would like to have the chance to chat with you about this today.

Thank you for your attention to this matter.

Ioana

IOANA STOICA, B. Sc., M. Sc
Environmental Project Manager -Senior - Calgary
istoica@maxxam.ca

Office 403 735 2227
Toll free 800 386 7247 / Fax 403 735 2240

My regular office hours are:

Monday - Friday: 07:30AM- 04:00PM
Maxxam Analytics - A Bureau Veritas Group Company
Success Through Science®. maxxam.ca

SUMMER HOURS START SUNDAY MAY 14, 2017
Sample Reception Hours: Mon-Fri 8am-8pm, Sat/Sun 9am-5pm
Office Hours: Mon-Fri 8am-5pm
NOTE: We will be CLOSED on Monday July 3rd for Canada Day.

Couriers are not delivering or picking up on July 1st, 2nd or 3rd.

For urgent customer service inquiries after hours, please contact our on call project managers at **403 651 2436 for Calgary** and **780 722 8050 for Edmonton.**

Click here if you do not wish to receive announcements or occasional marketing updates from Maxxam.

From: Linsay Sunderman
Sent: June-27-17 1:17 PM
To: Forkheim, Carl
Cc: Schmidt, Brent; Ioana Stoica
Subject: RE: Chemistry results - Double check

Hi Carl, Brent,
I've asked your contact at Maxxam, Ioana Stoica, to look into this for you.
Thank you

LINSAY SUNDERMAN, Envi Tech
Senior Project Manager
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From: Forkheim, Carl [mailto:Carl.Forkheim@tetratech.com]
Sent: Tuesday, June 27, 2017 11:42 AM
To: Linsay Sunderman
Cc: Schmidt, Brent
Subject: Chemistry results - Double check

Hi Linsay,

This is in reference to the following reports, B743380V1, B744752V1, B745326V1 and B744968V1 for the Ryley Landfill, submitted under our project number SWM.SWOP03652-01 and SWM.SWOP03011-05.

- Some of the ionic balance results have a high relative percent differences according to our duplicate samples, can you have a look at the calculations for those results?
- Three of our duplicate samples failed on copper, can you double check the copper specifically?
    - The samples are :
      RE9045, RE9049, RE9053, RE9062, RE9063, RE9064, RF6394, RF6395, RF6456 and RF6457

Thanks,

Carl

Carl Forkheim, Geol.I.T | Junior Hydrogeologist
Direct **(403) 718-3218** | Business **(403) 203-3355 x605** | Cell **(403) 510-7241** | Carl.Forkheim@tetratech.com

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APPENDIX E

HISTORICAL ANALYTICAL RESULTS

Table E1A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 1A																		
			Apr-91	Oct-91	Apr-92	Oct-92	Apr-93	Oct-93	Apr-94	Oct-94	Apr-95	Oct-95	Apr-96	Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00
Field Measurements																						
Field pH	-	-	7.71	8.4	7.7	8.1	8.4	7.7	8.4	8.29	7.9	7.7	7.7	7.6	7.5	7.7	7.6	7.03	7.58	7.03	7.52	7.2
Routine Water																						
pH	-	6.5 - 8.5	8.0	7.8	7.9	7.5	7.7	7.6	8.2	8.0	7.9	7.7	7.86	7.92	7.68	7.94	7.79	7.72	7.66	7.76	7.80	7.71
Conductivity (EC)	µS/cm	-	4420	4500	5050	5450	5300	5630	5420	5840	5530	5960	5540	5710	5550	5240	5590	6230	5610	6520	6740	5790
Calcium	mg/L	-	96	104	97	115	108	114	109	131	120	134	121	127	101	122	122	75	141	132	169	389
Magnesium	mg/L	-	25	33	27	33.4	31.3	33.7	31.8	37.5	34.1	41	34.8	36.6	30.2	32.8	29.3	40.7	42.4	44.1	47.2	94.1
Sodium	mg/L	200	1150	1160	1140	1260	1240	1360	1260	1230	1360	1394	1350	1330	1360	1460	1360	1590	1360	1590	1570	1520
Potassium	mg/L	-	8.9	8.7	9.9	8.34	7.71	7.74	8.46	7.61	7.94	8	6.73	6.88	5.71	7.26	5.87	8.26	7.56	10.8	7.9	17.9
Iron	mg/L	0.3	0.02	<0.02	0.33	11.3	0.07	2.71	< 0.04	0.04	< 0.04	0.028	0.5	0.07	0.06	0.037	0.134	0.216	0.514	0.024	0.044	< 0.003
Sulphate	mg/L	500	2171	2030	2400	2460	2460	2450	2350	2420	2590	2681	2670	2570	2830	3010	2510	3330	2950	3460	3330	3490
Chloride	mg/L	250	1	10	3	0.6	0.5	0.9	0.8	<0.1	0.6	3	1.4	4.9	0.4	1.4	1.1	<0.5	1.4	0.7	<0.5	<0.5
Bicarbonate	mg/L	-	706	776	788	806	797	802	809	815	814	812	811	820	794	793	792	774	767	768	760	781
Carbonate	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<6	<6
Nitrate	mg/L	10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.05	0.16	0.213	<0.04
TDS*	mg/L	500	3704	3760	4330	4270	4240	4360	4160	4220	4500	5075	4590	4480	4720	5020	4410	5430	4880	5620	5510	5700
Water Nutrients																						
Ammonia-N	mg/L	-	3	<1	<1	0.755	0.808	0.85	0.58	0.503	0.58	0.721	0.424	0.538	0.385	0.59	0.58	0.78	0.45	0.54	0.48	0.63
TKN	mg/L	-	3	<1	1.1	1.64	1.1	1.45	1.12	1.13	1.2	1.46	1.81	1.31	2.73	1.12	1.24	1.34	0.97	1.2	1.63	1.16
Organics																						
COD	mg/L	-	18	26	12	64	30	31	26	47	54	26	24	51	22	35	38	63	53	38	36	37
TOC	mg/L	-	9	19	9	11.8	8.3	10.8	9.9	8.5	10.2	8.9	8.9	10.2	12.1	11.4	14.3	14.5	18.2	15.2	14.4	15
Oil & Grease	mg/L	-	<1	<1	<1	<0.2	<0.2	6	0.9	0.4	0.3	<0.2	<0.2	0.4	<0.2	<1	1	1	2	<1	<1	7
Metals																						
Antimony	mg/L	0.006	0.001	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	0.0062	<0.0005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.006	<0.006
Barium	mg/L	1	0.04	0.022	0.021	0.038	0.005	0.009	<0.004	<0.004	<0.004	0.0102	0.0148	0.0089	0.0093	0.0097	0.0105	0.0097	0.0128	0.008	0.0068	0.007
Cadmium	mg/L	0.005	<0.01	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.003	<0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0006	<0.0006
Chromium	mg/L	0.05	0.02	<0.006	<0.006	<0.006	0.012	<0.005	<0.005	<0.006	<0.006	0.0022	0.0015	0.0009	<0.0008	<0.0008	<0.0008	0.0014	<0.0008	<0.0008	<0.0009	<0.0009
Cobalt	mg/L	-	<0.01	<0.01	<0.01	<0.01	0.01	0.03	<0.01	<0.01	<0.01	0.0012	0.0013	0.0009	0.0009	0.0009	<0.0007	0.0035	0.0042	0.0038	0.0056	0.0048
Copper	mg/L	1	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.608	<0.001
Lead	mg/L	0.010	<0.03	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	0.034	<0.002
Mercury	mg/L	0.001	<0.0002	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	-	0.05	0.03	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.001	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L	-	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.003	0.002	0.001	0.002	0.001	<0.001	0.003	0.001	0.007	0.006	0.002
Zinc	mg/L	5.0	0.04	0.019	0.04	0.071	0.021	0.014	< 0.005	< 0.005	< 0.005	0.0031	0.008	0.0282	0.001	0.0261	0.0065	0.0054	0.0088	0.0201	0.11	0.0203

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table E1B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 1B																														
			Apr-96	Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	Jun-14	May-15	Jun-16	Jun-17
Field Measurements																																		
Field pH	-	-	n/a	8.4	8.5	n/a	8.3	7.12	7.73	7.2	7.42	7.03	7.51	7.03	7.36	7.72	7.37	7.63	7.67	7.67	7.36	7.31	7.37	7.68	7.59	7.94	7.664	7.800	8.11	7.67	7.61	6.17	9.9	8.4	6.33	-
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.6	21.5 (EF)	7.93	6.86	13.04	10.24	5.480	3.096	3.3	3.08	2.47	4.11	2.95	3.05	3.67	-
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.4	3.2	6.8	6.2	8.3	9.11	5.1	11.7	21.9	8	7.7	8.2	7.5	8.3	n/a	-
Routine Water																																		
pH	-	6.5 - 8.5	n/a	8.38	8.23	8.39	8.47	8.05	8.06	8.16	7.93	7.8	7.93	7.83	7.75	7.88	7.89	7.84	8.1	8.1	8.1	8.1	8.1	8.3	8.3	8.2	8.2	8.29	8.23	8.32	8.44	8.41	8.05	8.24	8.44	8.54
Conductivity (EC)	µS/cm	-	n/a	5160	3410	2790	2600	4620	4970	6340	6960	7420	7140	7860	7190	7960	7190	8450	9150	8840	8320	8430	6540	6840	5830	4900	4420	5000	4020	2900	3700	3,200	2800	2900	2700	2900
Calcium	mg/L	-	n/a	72.7	15.3	17.7	10.6	44.2	49.5	72.9	99.9	149	109	152	115	143	124	208	249	172	186	149	105	99.2	67.1	46.4	43.5	43.2	25.3	13	19	14	12	12	10	12	12
Magnesium	mg/L	-	n/a	12.7	2.1	5.8	2.9	8.4	7.9	9.3	19.1	31.6	15.5	27.1	17.5	22.3	18	35.7	48.2	35.5	31.9	26.8	15.9	20.8	10.1	6.9	7.9	6.26	3.61	1.9	2.8	2	1.7	1.6	1.3	1.6
Sodium	mg/L	200	n/a	1300	819	843	685	1240	1390	1900	1800	2130	1970	2190	2100	2290	1850	2420	2420	2270	2180	2150	1730	1750	1470	1260	1100	1170	941	750	890	730	740	740	680	670
Potassium	mg/L	-	n/a	7.59	3.32	8.38	4.51	8.98	5.18	5.97	6	7.3	5.1	8.3	7	7.4	7.2	9.6	7.5	8.2	8.4	7.8	6.3	10.1	6.5	3	2.4	3.82	3.51	2.2	3.6	2.6	2.5	2.4	2.1	2.2
Iron	mg/L	0.3	n/a	0.08	0.15	5.04	0.268	3.9	0.387	n/a	0.378	0.022	0.067	< 0.02	0.079	< 0.1	< 0.1	< 0.1	0.009	0.061	<0.005	<0.005	0.094	0.010	<0.005	<0.005	<0.005	<0.0050	0.024	<0.06	<0.060	<0.060	0.64	<0.060	<0.060	<0.060
Sulphate	mg/L	500	n/a	2420	1020	935	573	1950	2430	3620	3590	4410	3860	4480	4350	5050	4030	5240	5320	4880	4240	4540	3240	3220	2360	1830	1590	1960	1270 *	670	1200	860	680	680	540	610
Chloride	mg/L	250	n/a	4.5	8.2	9.4	12.9	7.5	4.8	8.5	1.5	0.9	< 0.5	0.9	0.5	1.7	1.9	1.3	1	2	1	2	4	4	4	6	6	3.8	<10 *	6	4.8	5.2	5.1	6.1	6.1	6.2
Bicarbonate	mg/L	-	n/a	625	880	959	946	862	805	696	737	667	640	634	635	653	684	651	644	673	669	673	780	750	889	984	1030	915	1010	1100	1000	1,000	1100	1100	1100	1000
Carbonate	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<5	<6	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	6	<5	<5	<5	<5	<5.0	8.4	15	16	<0.50	<0.50	13	21
Nitrate (N)	mg/L	10	n/a	n/a	n/a	n/a	n/a	3.1	3.54	1.92	4.33	2.69	4.75	5.79	2.92	5.86	2.99	4.64	5.1	0.4	0.7	7.4	6.6	3.0	3.3	17.3	4.9	3.81	4.7 *	2.2	5	5.3	3.7	0.89	1.1	13
TDS*	mg/L	500	n/a	4120	2300	2300	1790	3680	4280	5950	5880	7700	6280	7160	6910	7840	6360	8230	8390	7700	6980	7240	5510	5490	4370	3710	3280	3650	2670	2000	2700	2,200	2000	2000	1800	1800
Water Nutrients																																		
Ammonia-N	mg/L	-	n/a	1.28	0.831	0.56	0.82	1.17	1.6	1.97	0.93	1.15	0.95	0.7	1.29	0.61	0.85	0.61	0.59	1.56	1.28	1.25	0.57	0.96	0.95	0.23	0.14	0.823	0.43	0.41	0.47	0.36	<0.050	0.26	0.36	-
TKN	mg/L	-	n/a	9.09	5.77	2.92	2.74	2.44	2.54	3.68	2.65	2.5	2.94	2.53	4.05	2.66	3.79	3.52	2.4	3.2	2.9	4.2	3.0	2.4	2.1	1.6	1.7	2.34	2.63	2.2	2.8	2.4	2.2*	1.6	0.96	-
Hydrocarbons																																		
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10) - BTEX	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.75	<0.10	<0.10	<0.10	<0.27
Organics																																		
COD	mg/L	-	n/a	295	421	156	147	102	65	17	15	74	83	82	235	84	239	114	100	80	95	73	76	90	49	38	33	44	32.7	33	120	270	98	120	47	-
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	14	15.5	12.6	14	13	11	9.9	10	8.8	11
Metals																																		
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0044	0.061	0.059
Antimony	mg/L	0.006	n/a	< 0.005	< 0.005	n/a	< 0.005	n/a	< 0.005	n/a	< 0.006	< 0.006	< 0.03	< 0.02	< 0.005	0.0005	0.0027	0.0003	0.0008	0.0013	0.0011	<0.0004	0.0012	0.0008	0.0008	0.0011	n/a	n/a	0.00047	<0.006	<0.00060	0.00064	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00098
Barium	mg/L	1	n/a	0.0343	0.0524	n/a	0.0331	n/a	0.0351	n/a	0.0297	0.0173	0.0717	0.021	0.0147	0.019	0.016	0.016	0.014	0.013	0.015	0.011	0.041	0.011	0.012	0.016	0.016	0.0119	0.0225	0.017	0.015	0.017	0.039	0.017	0.021	0.024
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.63	0.62	0.64
Cadmium	mg/L	0.005	n/a	< 0.0005	< 0.0005	n/a	< 0.0005	n/a	< 0.005	n/a	< 0.0006	< 0.0006	< 0.003	< 0.003	< 0.0005	< 0.00001	< 0.0001	0.00003	< 0.001	< 0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0010	<0.000050	<0.000050	0.000038	0.000057	<0.000025	0.000029	0.000029	0.000022
Chromium	mg/L	0.05	n/a	0.0012	0.0015	n/a	0.0012	n/a	< 0.0008	n/a	< 0.0009	< 0.0009	< 0.0044	0.005	< 0.0008	0.0012	< 0.005	0.0008	< 0.005	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.0010	<0.0010	0.0034	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	n/a	0.0035	0.0031	n/a	< 0.0007	n/a	0.0043	n/a	0.0046	0.0041	0.013	0.012	0.0032	0.0004	< 0.001	0.0007	< 0.002	< 0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	0.00066	0.00068	0.001	0.00058	0.00083	0.00099
Copper	mg/L	1	n/a	0.002	0.01	n/a	0.006	n/a	0.004	n/a	< 0.001	0.003	< 0.006	< 0.005	0.006	0.009	< 0.01	0.012	0.018	0.021	0.015	0.014	0.008	0.007	0.005	0.003	0.004	0.005	0.0084	<0.002	0.0008	0.0032	0.0057	0.0020	0.0035	0.0018
Lead	mg/L	0.010	n/a	< 0.002	0.003	n/a	0.003	n/a	< 0.002	n/a	0.005	< 0.002	< 0.01	< 0.01	< 0.002	0.0008	< 0.001	0.0004	< 0.005	< 0.005	<0.001	<0.001	0.0005	<0.0001	<0.0001	<0.0001	<0.005	<0.0050	0.0003	<0.002	<0.00020	0.00056	<0.00020	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.10	0.057	0.095
Mercury	mg/L	0.001	n/a	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	n/a	n/a	< 0.0001	< 0.0001	< 0.0001	< 0.0001	n/a	n/a	n/a	< 0.0001	< 0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<3E n/a 06	<3E n/a 07	0.00003	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	n/a	0.038	0.023	n/a	0.012	n/a	0.01	n/a	0.006	0.004	0.008	< 0.005	0.004	0.004	< 0.01	0.005	< 0.005	< 0.005	<0.005	<0.005	<0.005	0.005	0.006	0.006	0.019	0.0061	0.0062	0.011	0.0095	0.011	0.0085	0.0082	0.0084	0.0075
Nickel	mg/L	-	n/a	0.017	0.007	n/a	0.004	n/a	0.005	n/a	0.006	0.006	< 0.006	0.01	0.006	0.0022	< 0.005	< 0.0005	< 0.002	0.005	0.005	0.005	0.007	0.006	0.003	0.004	0.004	0.005	0.0072	<0.005	0.004	0.0053	0.0068	0.0038	0.0060	0.0056
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	0.00058	0.00035
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0019	0.0022	0.0020
Zinc	mg/L	5	n/a	0.0116	0.0013	n/a	0.0017	n/a	0.0018	n/a	0.0159	0.0222	0.017	0.147	0.0146	0.06	0.02	0.015	0.014	0.028	0.026	0.017	0.03	0.003	0.008	0.008	0.01	0.0052	0.0068	<0.03	<0.0030	0.0078	0.0034	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.645
Volume Purged (L)	22 (dry)
Sampling Date	6-Jun-17
Static Water Level	3.530

Table E1C: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 1C						
			Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements									
Field pH	-	-	7.61	6.1	5.41	8.0	8.2	6.43	7.6
Field EC	mS	-	5.85	19.99	7.03	6.1	6.42	7.54	7270
Field Temperature	°C	-	11.3	10	6.4	6.7	6.6	8.1	9.7
Routine Water									
pH	-	6.5 - 8.5	8.05	8.11	8.26	8.08	7.98	8.18	8.23
Conductivity (EC)	µS/cm	-	5800	5800	5900	5900	6100	6100	6100
Calcium	mg/L	-	150	130	130	130	140	140	150
Magnesium	mg/L	-	37	34	34	33	34	36	38
Sodium	mg/L	200	1300	1400	1300	1300	1400	1300	1400
Potassium	mg/L	-	7.6	6.7	6.2	4.8	6.6	6.9	7.1
Iron	mg/L	0.3	<0.06	<0.060	0.095	<0.60	<0.060	<0.060	<0.6
Sulphate	mg/L	500	2700	2600	2800	3000	2900	2800	2600
Chloride	mg/L	250	2	1.8	1.3	1.1	1.7	1.4	<1
Bicarbonate	mg/L	-	740	760	760	770	750	710	760
Carbonate	mg/L	-	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	0.009	0.0078	0.25	0.093	0.080	0.22	0.41
TDS*	mg/L	500	4600	4600	4600	4800	4800	4700	4600
Water Nutrients									
Ammonia-N	mg/L	-	0.74	0.66	0.57	0.57	0.60	0.46	0.7
TKN	mg/L	-	1.6	1.3	1.2	1.2	1.2	0.58	1.1
Hydrocarbons									
Benzene	mg/L	0.005	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Toluene	mg/L	0.024	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Ethylbenzene	mg/L	0.0016	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Xylene	mg/L	0.02	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.0008
F1 (C6-C10)	mg/L	-	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
F2 (>C10-C16)	mg/L	-	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Organics									
COD	mg/L	-	78	56	46	39	42	51	28
DOC	mg/L	-	11	10	12	9.6	11	11	10
Metals									
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	<0.030	0.0079	0.0069
Antimony	mg/L	0.006	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	<0.0020	0.0011	0.00068
Barium	mg/L	1	0.06	0.037	0.035	<0.10	0.025	0.023	<0.1
Boron	mg/L	5	n/a	n/a	n/a	n/a	0.24	0.24	0.24
Cadmium	mg/L	0.005	0.00009	<0.050	0.000065	<0.000050	<0.00020	0.000036	<0.00002
Chromium	mg/L	0.05	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.001
Cobalt	mg/L	-	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.00087	0.00067
Copper	mg/L	1	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00070	0.00039
Lead	mg/L	0.010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.0002
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	0.27	0.28	0.28
Mercury	mg/L	0.001	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	0.003	<0.0020	0.002	<0.0020	<0.0020	0.0013	0.00068
Nickel	mg/L	-	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0021	0.0013
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	<0.0010	0.00036	0.00022
Zinc	mg/L	5	<0.03	<0.030	0.074	<0.030	<0.030	0.0037	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	6.448
Volume Purged (L)	13 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.492

Table E5.5A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 5A																							
			Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																										
Field pH	-	-	7.11	7.56	7.11	7.55	7.52	7.48	7.44	7.56	7.42	7.21	7.55	7.31	7.36	7.14	7.21	7.48	7.6	8.65	7.63	7.35	6.41	7.8	7.8	6.15	8.4
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.13	18.13 (EF)	8.47	8.03	1.77	9.67	7.78	3.695	4.5	9.11	3.86	1.03	9.71	10.05	12.74	2.05
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.1	8.3	5.7	9.7	6.2	11.22	5.6	9.5	9.6	11.1	8.3	6.5	6.0	7.1	n/a	8.2
Routine Water																											
pH	-	6.5 - 8.5	7.66	7.57	7.65	7.7	7.53	7.93	7.72	8.1	8.0	8.0	8.2	8.0	8.3	8.1	7.9	8	8.17	8.05	7.94	7.97	8.11	8.18	7.83	8.00	7.99
Conductivity (EC)	µS/cm	-	7520	7400	8100	7880	8350	7660	8320	7730	8110	7830	7000	8050	8450	8240	8380	7770	7920	8850	8800	8800	9200	9200	9500	9600	9600
Calcium	mg/L	-	179	179	199	187	208	207	203	192	169	215	209	209	221	221	189	195	178	202	200	220	230	260	250	270	290
Magnesium	mg/L	-	62.9	56.7	70.5	58	66	70.5	67.8	61.5	70.1	71	82.2	66.9	81.8	80.8	71.2	67.7	58.4	70.6	65	73	77	95	100	95	100
Sodium	mg/L	200	2110	1900	2090	2080	2220	1900	1950	1900	2030	2010	2180	1930	2040	2070	2050	1890	1800	1990	2000	2300	2100	2400	2300	2100	2200
Potassium	mg/L	-	11.6	7.3	9.8	8.3	8.7	6.3	8.5	6.7	9.3	9.4	10.0	9.1	10.5	10.5	6.4	5.5	8.8	9.28	8.2	10	9.1	10	10	11	10
Iron	mg/L	0.3	0.011	0.11	<0.02	<0.02	<0.1	<0.1	<0.1	0.012	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	0.011	<0.005	<0.0050	<0.010	<0.06	<0.060	<0.06	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	5010	4220	4640	4580	5060	4480	4600	4060	4420	3960	4650	4100	4290	4220	4220	3890	3900	4540 *	4500	5000	5200	5500	5500	5200	4900
Chloride	mg/L	250	< 0.5	< 0.5	1.0	1.3	< 0.5	1.4	1.6	1.0	2.0	2.0	2.0	2.0	2.0	2.0	<1	3	3.09	<10 *	2	2.4	1.7	2.6	2.4	2.1	2.6
Bicarbonate	mg/L	-	863	855	852	829	836	782	819	816	816	809	829	805	767	790	786	837	815	787	750	730	740	740	730	660	720
Carbonate	mg/L	-	<6	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.17	<0.04	0.22	0.046	<0.04	<0.04	0.29	0.7	0.4	0.4	0.2	0.3	0.4	0.5	0.3	0.7	0.56	<1.0 *	0.08	0.34	0.46	0.3	0.058	0.20	1.7
TDS*	mg/L	500	7650	6780	7430	7320	7980	7050	7230	6630	7100	6670	7540	6710	7030	6990	6920	6470	6350	7200	7200	7900	7900	8600	8500	8000	7900
Water Nutrients																											
Ammonia-N	mg/L		0.74	0.29	0.38	0.5	0.25	0.13	0.29	< 0.05	0.33	0.07	0.48	0.26	0.47	0.16	0.17	<0.05	0.053	<0.050	0.64	0.59	0.55	0.52	1.0	0.67	0.22
TKN	mg/L	-	1.52	1.31	1.44	1.66	1.39	1.14	1.57	0.9	1.0	1.0	1.6	1.2	1.8	1.3	1.0	1.7	1.77	1.61	1.8	1.7	1.5	1.6	2.2	1.3	1.2
Hydrocarbons																											
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																											
COD	mg/L	-	50	55	53	39	56	55	53	50	50	59	59	55	59	59	53	46	57	63.4	85	69	75	63	71	64	59
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21	19.8	24.4	25	23	25	21	28	24	24
Metals																											
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	<0.0030	0.016
Antimony	mg/L	0.006	<0.006	<0.05	<0.02	<0.02	<0.002	<0.002	<0.002	0.001	0.0013	0.001	<0.0004	0.0009	0.0008	<0.0004	0.0007	n/a	n/a	<0.00040	<0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00058	0.00047
Barium	mg/L	1	0.0063	0.006	0.012	0.0075	<0.01	<0.01	<0.01	0.007	0.007	0.009	0.007	0.007	0.007	0.008	0.007	0.008	0.0065	0.0072	<0.01	<0.010	<0.010	<0.10	<0.10	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.60	0.56	0.57
Cadmium	mg/L	0.005	<0.0006	<0.005	<0.003	<0.003	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0010	<0.000050	<0.000050	<0.050	<0.000050	<0.000050	<0.00020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0009	<0.008	<0.004	<0.004	0.0055	<0.005	0.0082	<0.005	<0.005	<0.005	0.007	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	0.006	0.016	0.012	0.015	0.0016	0.0015	0.0016	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.00086	0.00059
Copper	mg/L	1	0.001	<0.01	<0.005	<0.005	<0.01	<0.01	0.011	0.02	0.016	0.012	0.013	0.008	0.01	0.005	0.005	0.008	0.0078	0.0105	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.0057	0.0008
Lead	mg/L	0.010	<0.002	<0.02	0.016	0.01	<0.001	<0.001	<0.001	0.0008	<0.005	<0.0001	<0.0001	0.0002	<0.0001	0.0001	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.15	0.15	0.69
Mercury	mg/L	0.001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.000004	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.001	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00080	0.00088
Nickel	mg/L	-	0.004	<0.01	0.015	0.018	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	<0.002	0.007	0.006	0.007	0.0089	<0.005	<0.0050	<0.0050	<0.0050	0.0065	0.0086	0.0045
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0010	0.00031	0.00046
Zinc	mg/L	5	0.0332	0.025	0.021	0.005	0.022	<0.01	0.018	0.031	0.028	0.025	0.018	0.015	0.003	0.041	0.013	0.013	0.007	0.0115	<0.03	<0.030	<0.030	<0.030	<0.030	0.0033	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	7.68
Volume Purged (L)	25 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	3.031

Table E5.5B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 5B																		
			Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Jan-07	Apr-07	Oct-07	May-08	May-09	10-Jun	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																						
Field pH	-	-	7.95	7.47	7.96	7.56	7.64	7.73	8.10	n/a[1]	7.84	7.78	7.88	n/a[1]	7.93	8.45	7.91	6.9	8.3	8.3	-	-
Field EC	mS	-	n/a	n/a	n/a	3.9	6.99(EF)	3.36	9.47	n/a[1]	6.82	6.94	3.16	n/a[1]	11.6	1.25	2.65	2.53	2.43	2.89	-	-
Field Temperature	°C	-	n/a	n/a	n/a	10.1	3.3	9.6	5.9	n/a[1]	9.2	9.52	9	n/a[1]	6.1	11.4	12.5	10.7	10.0	9.3	-	-
Routine Water																						
pH	-	6.5 - 8.5	8.16	8.4	8.3	8.3	8.4	8.4	8.3	8.2	8.6	8.1	8.4	8.29	7.55	8.26	8.01	8.37	8.56	8.28	8.34	9.09
Conductivity (EC)	µS/cm	-	3720	3430	3430	3320	3310	3260	7760	3220	3260	3350	3190	2550	423	1000	2200	2200	2700	2700	3000	2300
Calcium	mg/L	-	25.2	17.9	8.2	18.3	16.4	16.9	191	16.3	15.8	16.4	14.8	13.3	55.3	23	67	61	23	13	13	8.2
Magnesium	mg/L	-	2.7	2.1	2.2	2.2	2.2	1.7	189	1.7	1.4	1.2	1.8	1.59	8.18	5.7	25	26	11	16	3.2	3.4
Sodium	mg/L	200	982	918	863	837	832	807	3780	822	826	839	736	594	17.6	210	430	390	570	600	750	520
Potassium	mg/L	-	3.7	3.2	3.1	2.7	3.2	3.5	12.3	3.2	4.1	2.3	2.4	3.48	2.59	2.4	2.8	2.6	3.7	3.6	4.2	13
Iron	mg/L	0.3	<0.05	0.019	0.008	0.037	<0.005	0.010	<0.005	n/a[1]	0.103	0.022	0.026	0.0802	<0.010	<0.06	<0.060	<0.060	0.13	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1260	1000	939	824	890	789	7040	744	745	779	675	527	158	270	600	560	630	600	650	440
Chloride	mg/L	250	7	8	9	9	9	10	241	8	8	9	12	10.5	2.05	17	61	45	30	24	16	17
Bicarbonate	mg/L	-	1030	1070	1100	1160	1150	1160	1440	1190	1160	1250	1210	972	41.9	290	660	690	950	1000	1200	790
Carbonate	mg/L	-	<6	19	14	7	20	26	7	<5	39	<5	27	<5.0	<5.0	<0.5	<0.50	9	36	<0.50	5	80
Nitrate (N)	mg/L	10	8.56	10	7.9	3.4	0.7	1.5	0.2	3.5	5.7	9.8	4.4	4.75	0.209	0.55	0.43	0.29	0.93	1.1	0.36	1.7
TDS*	mg/L	500	2780	2540	2420	2290	2340	2230	12200	2200	2230	2310	2090	1650	265	670	1500	1400	1800	1800	2000	1500
Water Nutrients																						
Ammonia-N	mg/L	-	0.49	0.54	0.43	0.09	0.81	0.24	<0.05	n/a	0.15	0.49	0.59	0.292	<0.050	0.19	0.29	0.2	0.36	0.50	0.10	0.32
TKN	mg/L	-	0.79	5.5	1.3	0.9	1.1	0.7	1.8	n/a	1.1	1.1	0.1	3.51	0.64	0.66	0.87	0.65	1.1	1.4	0.49	0.93
Hydrocarbons																						
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.1	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.05	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																						
COD	mg/L	-	47	30	20	35	19	26	70	n/a	25	45	24	25.6	12.4	37	39	25	52	56	23	48
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10	7.9	2.2	6.7	4.7	3.9	5.2	6.1	7.2	7.7
Metals																						
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0049	0.0062	0.031
Antimony	mg/L	0.006	<0.002	0.0011	0.0014	0.0012	0.0006	0.0012	0.0008	n/a	0.0028	0.0010	n/a	n/a	0.00553	<0.006	0.00074	0.00075	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00068	0.00094	0.002
Barium	mg/L	1	0.02	0.026	0.026	0.024	0.034	0.027	0.014	n/a	0.106	0.024	0.062	0.0339	0.0369	0.025	0.034	0.022	0.027	0.016	0.018	0.035
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.53	0.84	0.44
Cadmium	mg/L	0.005	0.0004	<0.001	<0.001	<0.00001	<0.00001	<0.00001	<0.00001	n/a	<0.0001	<0.0001	<0.001	<0.0010	0.000078	<0.000050	0.000095	0.000053	<0.000025	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<005	< 0.005	<0.005	<0.005	<0.005	0.012	n/a	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.0010	0.01	0.011	0.0082	0.010	0.0012
Cobalt	mg/L	-	<0.001	<0.002	< 0.002	<0.002	<0.002	<0.002	<0.002	n/a	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	0.00065	0.0003	<0.0003	<0.00030	0.00040	<0.00030
Copper	mg/L	1	<0.01	0.008	0.01	0.008	0.006	0.005	0.02	n/a	0.009	0.002	0.002	0.006	0.0011	<0.002	0.0026	0.0051	0.0033	0.0015	0.0033	0.0034
Lead	mg/L	0.010	<0.001	<0.005	< 0.005	<0.0001	<0.0001	0.0004	<0.00001	n/a	0.0002	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.024	0.026	<0.0040
Mercury	mg/L	0.001	<0.00001	<0.0002	< 0.0002	<0.00001	<0.00001	<0.00001	<0.00001	n/a	<0.0001	<0.0001	0.0001	<0.0001	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	<0.01	0.006	0.005	0.006	0.005	0.005	<0.005	n/a	0.021	<0.005	0.014	0.0098	0.0233	0.02	0.0059	0.0037	0.0061	0.0059	0.010	0.011
Nickel	mg/L	-	<0.005	0.003	0.004	0.004	0.004	0.004	0.014	n/a	0.008	0.003	<0.002	0.0052	0.0165	<0.005	0.021	0.013	0.0077	0.0077	0.013	0.0073
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	0.00029
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.011	0.0041	0.0032
Zinc	mg/L	5	0.019	0.021	0.018	0.011	0.008	0.01	0.008	n/a	0.019	0.012	0.005	0.0168	0.0068	<0.03	0.01	0.01	0.0033	<0.0030	0.0033	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.425
Volume Purged (L)	10 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	4.755

Table E8A: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 8A				
			Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	7.14	8.5	8.5	8.51	8.5
Field EC	mS	-	4.92	2.56	2.91	2.51	2.67
Field Temperature	°C	-	6.1	5.4	6.0	8.7	8.4
Routine Water							
pH	-	6.5 - 8.5	8.45	8.67	8.32	8.49	8.49
Conductivity (EC)	µS/cm	-	4100	2400	2700	2400	2500
Calcium	mg/L	-	25	7.7	7.6	7.8	8.3
Magnesium	mg/L	-	7.3	1.7	1.5	1.3	1.3
Sodium	mg/L	200	930	610	670	600	630
Potassium	mg/L	-	3.7	2.2	2.1	2.3	2.4
Iron	mg/L	0.3	<0.060	0.31	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1300	300	450	290	360
Chloride	mg/L	250	9.8	8.0	7.6	7.4	7.1
Bicarbonate	mg/L	-	1200	1300	1300	1200	1300
Carbonate	mg/L	-	26	49	3.0	25	21
Nitrate (N)	mg/L	10	0.017	<0.010	<0.010	<0.010	<0.044
TDS*	mg/L	500	2900	1600	1800	1500	1700
Water Nutrients							
Ammonia-N	mg/L	-	1.1	0.89	0.96	0.81	0.63
TKN	mg/L	-	1.9	1.5	1.6	1.1	1.3
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	79	68	71	36	40
DOC	mg/L	-	11	9	10	11	12
Metals							
Aluminum	mg/L	0.1	n/a	n/a	0.0043	0.0093	0.0088
Antimony	mg/L	0.006	0.00081	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	0.0014	0.0021	0.0019
Barium	mg/L	1	0.04	0.041	0.025	0.045	0.049
Boron	mg/L	5	n/a	n/a	0.68	0.72	0.77
Cadmium	mg/L	0.005	0.000035	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0012	0.0014	0.00033	0.00046	0.00032
Copper	mg/L	1	0.0017	0.00047	0.00064	0.00042	<0.00020
Lead	mg/L	0.01	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.017	0.015	0.025
Mercury	mg/L	0.001	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.012	0.00036	0.0057	0.0070	0.0062
Nickel	mg/L	-	0.005	0.0023	0.0020	0.0023	0.0011
Selenium	mg/L	0.05	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	0.00071	0.00092	0.00074
Zinc	mg/L	5	0.012	0.007	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.125
Volume Purged (L)	52 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	1.537

Table E8B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 8B				
			Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	6.57	7.6	8	7.73	7.8
Field EC	mS	-	10.05	8.96	9.28	8.94	9.25
Field Temperature	°C	-	7.4	4.0	6.6	6.8	5.8
Routine Water							
pH	-	6.5 - 8.5	8.31	8.37	7.95	8.19	8.17
Conductivity (EC)	µS/cm	-	8800	8500	8700	8700	8800
Calcium	mg/L	-	92	110	90	97	97
Magnesium	mg/L	-	48	62	56	54	57
Sodium	mg/L	200	2100	2300	2200	2000	2100
Potassium	mg/L	-	5.8	5.4	6.2	6.7	6.7
Iron	mg/L	0.3	<0.060	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	4300	4500	4200	3900	3900
Chloride	mg/L	250	23	23	26	28	30
Bicarbonate	mg/L	-	1100	1100	1100	1100	1100
Carbonate	mg/L	-	7.2	18	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.022	0.074	0.12	0.10	1.5
TDS*	mg/L	500	7100	7600	7100	6600	6800
Water Nutrients							
Ammonia-N	mg/L	-	0.61	0.57	0.69	0.62	0.38
TKN	mg/L	-	1.7	1.4	1.6	1.3	1.3
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	75	39	48	47	44
DOC	mg/L	-	13	13	14	15	16
Metals							
Aluminum	mg/L	0.1	n/a	n/a	<0.030	0.0050	0.0600
Antimony	mg/L	0.006	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	0.0021	0.0015	0.0013
Barium	mg/L	1	0.025	<0.10	<0.10	0.013	<0.10
Boron	mg/L	5	n/a	n/a	0.41	0.41	0.40
Cadmium	mg/L	0.005	0.000096	<0.000050	<0.00020	0.00003	<0.000020
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	<0.0030	<0.0030	0.0011	0.00095
Copper	mg/L	1	<0.0020	0.0031	<0.0020	0.00034	0.00039
Lead	mg/L	0.01	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.18	0.18	0.180
Mercury	mg/L	0.001	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0021	0.0023	<0.0020	0.0016	0.0013
Nickel	mg/L	-	0.0052	0.006	<0.0050	0.0035	0.0027
Selenium	mg/L	0.05	n/a	n/a	<0.0020	<0.00020	0.00025
Uranium	mg/L	0.02	n/a	n/a	0.0022	0.0024	0.0022
Zinc	mg/L	5	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	5.4
Volume Purged (L)	24 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	1.425

Table E9: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 9																					
			Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																										
Field pH	-	-	8.16	8.4	7.64	7.63	7.66	7.52	7.14	7.48	6.84	7.44	7.35	7.5	7.68	7.86	8.051	8.100	n/a	7.53	7.37	6.17	7.7	7.9	7.59	7.7
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7.77	15.74 (EF)	7.30	6.91	18	9.4	5.780	3.192	n/a	7.53	7.775	8.86	8.1	8.26	8.32	6.59
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.4	7.0	5.9	9.3	4.1	10.54	4.6	9.1	n/a	19.8	11.6	7.2	5.3	5.5	8.0	6.5
Routine Water																										
pH	-	6.5 - 8.5	7.85	8.5	8.24	7.76	7.77	7.8	8.2	8.1	8.0	8.2	8.0	8.4	8.1	8.0	8.3	8.26	8.16	7.99	7.76	8.21	8.27	7.81	7.96	7.88
Conductivity (EC)	µS/cm	-	5730	2580	5460	6680	6880	7250	7110	7010	6940	6370	7160	7220	8020	4620	5880	6900	7290	7600	7500	7700	7800	7800	7800	6400
Calcium	mg/L	-	66.2	21.7	61.4	90.3	107	93.3	101	66.1	99.9	86.9	101	98.2	297	60.2	92.8	102	108	98	110	110	120	110	120	79
Magnesium	mg/L	-	41.6	9.95	33.8	51.5	62.8	53.6	59.5	55	57.4	58.6	57.9	58	175	38.8	58.7	61.2	64.3	51	60	59	66	56	66	46
Sodium	mg/L	200	1440	570	1390	1800	1690	1710	1780	1760	1770	1850	1740	1790	1730	1060	1400	1590	1700	1800	1900	1800	1800	1900	1900	1200
Potassium	mg/L	-	13	8.3	14	17	13	16	13	16.4	14.6	17	15.3	16.3	8.7	10.2	10.5	12.4	15	13	15	14	15	15	15	12
Iron	mg/L	0.3	0.08	0.711	0.019	<0.05	<0.1	<0.1	<5	<0.005	0.007	<0.005	<0.005	<0.005	0.076	0.029	0.011	<0.0050	0.02	1.2	0.79	0.33	<0.60	<0.060	<0.60	<0.060
Sulphate	mg/L	500	2820	947	2600	3620	3600	3420	3370	3280	3030	3360	3330	3110	3940	1750	2460	3050	3280	3500	3700	3900	4000	3800	4000	2800
Chloride	mg/L	250	<0.5	2.5	0.9	<0.5	<0.5	1.2	1	2	2	5	2	2	114	52	48	17.7	<10 *	3	2.6	1.9	2.1	1.6	1.2	69
Bicarbonate	mg/L	-	1050	502	966	1090	1150	1150	1140	1160	1160	1240	1170	1070	746	762	966	1070	1120	1100	1100	1100	1100	1100	1100	920
Carbonate	mg/L	-	<6	29	<6	<6	<6	<6	<5	<5	<5	<5	<5	20	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.04	0.205	0.237	<0.04	<0.04	<0.04	0.5	0.3	0.2	<0.1	0.3	0.2	0.2	0.1	<0.1	<0.050	<1.0 *	0.09	<0.0030	0.11	0.079	0.17	0.081	1.8
TDS*	mg/L	500	4900	1840	4570	6110	6030	5860	5890	5750	5540	5950	5820	5620	6630	3350	4550	5360	5720	6100	6300	6400	6600	6400	6500	4700
Water Nutrients		-																								
Ammonia-N	mg/L		0.5	0.27	0.45	0.31	0.47	0.31	0.44	0.52	0.42	0.41	0.54	0.59	0.07	0.16	0.61	0.826	0.812	0.86	1.4	0.85	0.81	0.53	0.32	0.23
TKN	mg/L	-	1.33	1.18	2.03	1.28	1.36	1.04	0.9	0.6	0.8	1.2	1.3	0.9	6.1	1.7	2.1	2.87	2.13	3.1	1.6	1.4	1.6	1.3	0.77	2.4
Hydrocarbons		-																								
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics		-																								
COD	mg/L	-	24	45	112	22	13	17	20	< 10	14	29	14	11	287	63	77	55.7	39.8	26	460	46	42	62	21	110
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	28	18.3	14.2	9.8	8.3	7.8	5.5	6.9	5.9	23
Metals		-																								
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.011	0.0038
Antimony	mg/L	0.006	<0.05	<0.02	<0.02	<0.001	< 0.002	<0.002	0.01	0.001	0.0006	<0.0004	0.0006	0.0006	<0.0004	0.0009	n/a	n/a	<0.00040	<0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00036	0.00093
Barium	mg/L	1	0.028	0.055	0.063	0.042	0.021	0.026	0.016	0.015	0.014	0.108	0.011	0.011	0.069	0.019	0.03	0.019	0.0172	0.015	0.016	0.014	<0.10	0.010	<0.10	0.046
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.29	0.31	0.28
Cadmium	mg/L	0.005	<0.005	<0.003	<0.003	<0.00005	< 0.0001	0.00014	0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.001	<0.0010	<0.000050	<0.000050	0.000061	0.000051	<0.000050	<0.00020	<0.000020	0.000053
Chromium	mg/L	0.05	<0.008	<0.004	<0.004	0.0055	0.0061	0.0069	0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	0.014	0.0055	0.01	0.0014	< 0.001	0.0016	<0.002	< 0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	0.003	<0.0030	0.00069	0.0016
Copper	mg/L	1	<0.01	<0.005	0.005	0.007	< 0.01	0.014	0.033	0.024	0.015	0.004	0.006	0.007	0.013	0.003	0.006	0.0052	0.0076	<0.002	0.0054	<0.0020	<0.0020	<0.0020	0.0013	0.0042
Lead	mg/L	0.01	<0.002	0.018	0.01	<0.0005	< 0.001	<0.001	0.0003	<0.005	0.0001	<0.0001	0.0002	<0.0001	<0.0001	0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00027	0.0003
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.22	0.21	0.37
Mercury	mg/L	0.001	<0.001	<0.0001	<0.0001	<0.0001	< 0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000042	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.01	0.019	<0.005	<0.005	< 0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.010	0.016	0.014	<0.0050	<0.0050	0.004	<0.0020	0.0023	0.0033	0.0022	0.0017	0.072
Nickel	mg/L	-	<0.01	0.008	0.01	< 0.003	<0.005	0.0066	0.003	<0.002	<0.002	0.004	<0.002	0.003	0.029	0.013	0.016	0.0075	0.0061	<0.005	0.007	<0.0050	0.0061	<0.0050	0.0020	0.013
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00023	0.0021
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0037	0.004	0.0056
Zinc	mg/L	5	0.015	0.01	0.008	0.013	<0.01	0.022	0.031	0.025	0.023	0.004	0.011	<0.002	0.044	0.030	0.011	0.0086	0.0061	<0.03	<0.030	<0.030	<0.030	<0.030	0.0034	0.0094

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	5.37
Volume Purged (L)	12 (Dry)
Sampling Date	7-Jun-17
Static Water Level (mbtoc)	1.453

Table E10: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 10																						
			Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																									
Field pH	-	-	n/a	8.27	n/a	8.39	8.42	8.11	7.54	7.63	7.54	7.68	7.52	7.93	7.99	8.03	7.86	7.870	8.26	7.92	7.69	7.77	8.3	8.3	8.06	8.0
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.23	9.72 (EF)	4.39	3.79	9.20	9.06	3.98	4.250	5.7	4.52	2.03	4.52	4.92	4.98	4.42	4.26
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5.7	4.9	4.6	10.2	3.5	11.55	8	4.3	16.4	17	8.6	11.5	4.2	7.5	9.8	10.3
Routine Water																									
pH	-	6.5 - 8.5	n/a	8.31	n/a	8.43	8.57	8.25	8.4	8.3	8.2	8.4	8.2	8.4	8.3	8.1	8.2	8.16	8.32	8.18	8.1	8.33	8.12	7.79	8.26	8.11
Conductivity (EC)	µS/cm	-	n/a	2570	n/a	2640	2700	3090	3450	3330	3710	3370	3980	3910	4320	4300	4210	4440	4460	4600	4900	4600	4600	4700	4500	4100
Calcium	mg/L	-	n/a	28.3	n/a	25.8	29.7	34.8	52.8	34.9	65.3	62.5	72.3	65.2	86	78.4	79.6	82.2	78.4	72	91	83	68	140	60	71
Magnesium	mg/L	-	n/a	14.9	n/a	15.1	16.6	16.1	21.7	20.5	25.2	26.7	27.0	29.4	35.9	31.6	31.4	28.2	34.1	34	33	34	35	44	31	32
Sodium	mg/L	200	n/a	593	n/a	687	659	678	798	732	836	887	906	888	1010	1000	969	971	929	990	1200	1100	990	910	840	870
Potassium	mg/L	-	n/a	3	n/a	2.7	3.3	2.7	1.4	2.4	4.5	4.2	4.5	4.9	5.3	4.9	2.9	5.23	4.72	4.2	5	4.4	4	4.5	4.4	4.2
Iron	mg/L	0.3	n/a	<0.02	n/a	<0.05	0.19	<0.05	0.329	0.006	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.033	0.012	<0.06	<0.060	<0.060	<0.060	8.3	<0.060	<0.060
Sulphate	mg/L	500	n/a	915	n/a	1080	1130	1160	1440	1250	1450	1560	1690	1560	1830	1850	1750	1950	1870	1900	2200	2200	2100	1900	1700	1600
Chloride	mg/L	250	n/a	3.2	n/a	1.4	2.1	4.8	8	8	13	12	14	12	15	16	19	19.4	16 *	23	25	23	26	140	60	59
Bicarbonate	mg/L	-	n/a	640	n/a	539	467	614	571	578	579	581	579	559	591	595	613	599	579	590	600	580	600	590	620	630
Carbonate	mg/L	-	n/a	< 6	n/a	26	46	< 6	7	< 5	<5	6	<5	12	<5	<5	<5	<5.0	5.7	<0.5	<0.50	4.6	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	n/a	1.04	n/a	0.771	0.436	< 0.04	0.2	0.4	0.1	0.2	0.2	0.2	0.2	0.3	0.1	<0.050	<1.0 *	0.14	0.019	0.13	0.079	0.014	0.04	3.0
TDS*	mg/L	500	n/a	1870	n/a	2100	2120	2200	2610	2340	2680	2840	3000	2850	3270	3280	3150	3350	3220	3300	3900	3700	3500	3400	3000	3000
Water Nutrients		-																								
Ammonia-N	mg/L		n/a	<0.05	n/a	<0.05	<0.05	<0.05	0.07	0.1	<0.05	0.16	0.17	0.10	<0.05	0.13	0.06	0.111	<0.050	0.07	0.31	0.094	0.17	0.23	0.16	0.052
TKN	mg/L	-	n/a	0.32	n/a	0.41	0.06	0.42	0.7	0.4	0.9	0.7	1.1	0.7	0.6	0.5	1.2	0.96	1.09	0.61	0.86	0.69	0.68	0.68	0.57	0.49
Hydrocarbons		-																								
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																										
COD	mg/L	-	n/a	5	n/a	13	18	14	20	20	24	24	23	22	26	26	23	25.6	15.5	32	33	43	33	35	32	24
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8	8.3	9.2	11	10	11	9.6	11	9.7	8
Metals																										
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0030	0.0091	<0.0030
Antimony	mg/L	0.006	n/a	<0.02	n/a	<0.001	n/a	<0.001	0.0209	0.0011	0.0007	<0.0004	0.0004	0.0008	<0.0004	0.0009	n/a	n/a	<0.00040	<0.0006	<0.0030	0.00073	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00049	0.0006	0.00042
Barium	mg/L	1	n/a	0.022	n/a	0.017	n/a	0.026	0.026	0.024	0.025	0.024	0.018	0.020	0.023	0.017	0.018	0.0121	0.0184	0.018	0.015	0.015	0.016	0.087	0.023	0.023
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.11	0.12	0.13
Cadmium	mg/L	0.005	n/a	<0.003	n/a	<0.00005	n/a	<0.00005	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0010	<0.000050	<0.000025	0.000047	0.000045	<0.000025	0.000049	0.000023	0.000021
Chromium	mg/L	0.05	n/a	0.0075	n/a	0.015	n/a	0.011	0.008	0.006	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.002	<0.0050	<0.0010	0.0014	<0.0010	0.0021	0.0018
Cobalt	mg/L	-	n/a	0.0035	n/a	<0.0005	n/a	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0003	<0.0015	0.00059	0.00042	0.014	0.00057	0.00045
Copper	mg/L	1	n/a	0.068	n/a	<0.005	n/a	0.005	0.029	0.012	0.011	0.005	0.004	0.005	0.003	0.003	0.005	0.004	0.0055	0.0014	0.0012	0.0025	0.17	0.0079	0.0035	0.0033
Lead	mg/L	0.01	n/a	<0.01	n/a	<0.0005	n/a	<0.0005	0.0002	<0.005	0.0003	<0.0001	0.003	0.0001	0.0001	0.0002	<0.005	<0.0050	<0.00010	<0.0002	<0.0010	<0.00020	0.009	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.8	0.094	0.076
Mercury	mg/L	0.001	n/a	<0.0001	n/a	<0.0001	n/a	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.00010	<0.00010	<0.000005	0.0000056	<0.000010	<0.0000050	<0.0000050	0.0000034	<0.0000020
Molybdenum	mg/L	-	n/a	<0.005	n/a	<0.005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.0019	0.0012	0.0015	0.0022	0.0017	0.0038	0.0022
Nickel	mg/L	-	n/a	0.007	n/a	<0.003	n/a	0.0051	0.005	0.003	0.004	0.003	0.003	0.005	0.003	0.010	0.005	0.0082	0.0081	0.0059	0.0094	0.0088	0.0078	1.5	0.059	0.033
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0003	0.00052	0.00053
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0048	0.0093	0.0086
Zinc	mg/L	5	n/a	0.184	n/a	0.007	n/a	0.006	0.018	0.018	0.015	0.006	0.009	0.003	0.011	0.018	0.01	0.0111	0.0031	0.009	0.018	0.0063	0.11	0.0038	0.0065	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	3.87
Volume Purged (L)	8 (Dry)
Sampling Date	7-Jun-17
Static Water Level (mbtoc)	1.312

Table E11: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 11																						
			Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																									
Field pH	-	-	7.73	7.64	7.62	7.69	8.02	7.72	7.47	7.01	6.83	7.33	7.29	7.62	7.55	6.98	7.656	7.477	7.55	7.73	7.41	7.31	7.5	7.8	7.61	7.7
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.65	27.2 (EF)	9.4	7.7	21.50	19.16	8.550	9.380	38.0	9.6	4.31	9.67	10.02	10.14	9.90	9.71
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.0	5.0	4.4	9.6	4.8	11.25	7.1	7.0	24.1	9.9	8.8	10.5	6.2	6.4	8.6	7.4
Routine Water																										
pH	-	6.5 - 8.5	7.83	7.75	7.79	7.78	8.09	7.95	8.2	8.1	8.0	8.2	8.0	8.2	8.2	7.9	8.2	8.01	7.98	8.04	7.98	8.06	8.19	7.79	8.03	7.88
Conductivity (EC)	µS/cm	-	5900	7930	6680	7360	6040	8570	7770	8020	7710	8430	8900	10700 (EF)	8790	9370	8760	9420	8760	9800	9900	9300	9500	9500	9600	9100
Calcium	mg/L	-	104	152	114	146	105	175	165	151	169	231	218	271	201	219	195	220	175	190	240	220	240	210	230	200
Magnesium	mg/L	-	56.1	93.7	60.4	79.3	56.9	101	92.5	92.6	94.5	150	120	184	124	132	117	120	94.5	110	130	110	130	110	120	120
Sodium	mg/L	200	1560	1990	1710	2110	1440	2000	1930	2020	1960	2540	2180	2820 (EF)	2210	2320	2130	2220	1920	2200	2600	2100	2300	2200	2100	2100
Potassium	mg/L	-	4.6	8.4	6	8.8	< 4	6.6	5.5	8.2	7.3	9	8.3	11.1	9.2	6.1	3	9.25	7.69	7.1	9.1	7.1	7.6	8.4	9.1	8
Iron	mg/L	0.3	0.093	<0.02	0.019	<0.1	<0.1	<0.1	0.022	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.019	<0.005	<0.05	<0.010	<0.06	<0.060	<0.060	<0.60	<0.060	<0.060	<0.60
Sulphate	mg/L	500	3140	4390	3660	4720	3280	4720	4280	4380	3950	5550	4750	5710	4450	5190	4440	5020	4170	5300	5600	5400	5600	5100	4800	4500
Chloride	mg/L	250	1.7	4.3	2.7	2.7	2.4	5.4	5	5	5	9	7	17	8	16	10	9.17	<10 *	16	14	14	14	20	32	37
Bicarbonate	mg/L	-	735	851	747	793	769	864	747	756	751	936	808	1170	913	870	882	839	813	920	880	890	840	900	930	1000
Carbonate	mg/L	-	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.583	0.488	0.345	<0.04	<0.04	0.36	0.5	0.4	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.282	<1.0 *	0.49	0.27	0.37	0.27	0.19	0.23	0.71
TDS*	mg/L	500	5230	7060	5920	7450	5270	7430	6850	7030	6560	8950	7680	9590	7450	8310	7330	8010	6770	8300	9000	8300	8800	8200	7800	7500
Water Nutrients																										
Ammonia-N	mg/L		0.11	0.28	0.13	0.14	0.12	0.09	<0.05	0.12	<0.05	0.17	<0.05	0.07	<0.05	0.06	<0.05	0.088	<0.050	<0.05	0.14	0.081	0.14	0.17	0.15	0.086
TKN	mg/L	-	1.77	2.95	2.63	2.28	1.6	2.12	1.6	1.4	1.7	2	1.7	2.4	1.7	1.8	1.4	2.31	2.08	1.8	1.8	1.5	1.7	1.7	0.81	1.5
Hydrocarbons																		2.31								
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																										
COD	mg/L	-	103	116	167	108	84	104	100	100	99	118	105	119	92	98	80	101	90.7	110	100	95	96	100	100	84
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	34	36.4	34.7	36	36	33	29	34	36	31
Metals																										
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0060	<0.0030
Antimony	mg/L	0.006	<0.05	<0.02	<0.02	<0.002	<0.002	< 0.002	0.0474	0.0011	0.0009	<0.0004	0.0008	0.0012	<0.0004	0.001	n/a	n/a	0.00061	<0.006	<0.0060	0.001	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.0011	0.0011
Barium	mg/L	1	0.01	0.0315	0.012	0.017	0.01	0.014	0.019	0.011	0.012	0.014	0.010	0.009	0.009	0.010	0.008	0.0074	0.0084	<0.01	<0.010	<0.010	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.19	0.20	<0.20
Cadmium	mg/L	0.005	<0.005	<0.003	<0.003	0.00013	< 0.0001	0.00015	0.0002	<0.001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0010	<0.000050	<0.000050	0.000055	0.000084	<0.000050	<0.00020	0.000024	0.000029
Chromium	mg/L	0.05	<0.008	<0.004	<0.004	<0.005	< 0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.0010	<0.010	<0.010	0.0011	<0.0010
Cobalt	mg/L	-	0.014	0.015	0.014	0.0019	0.0011	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.00030	<0.0030	<0.0030	<0.00030	<0.00030
Copper	mg/L	1	<0.01	<0.005	<0.005	<0.01	< 0.01	0.012	0.068	0.033	0.025	0.014	0.010	0.014	0.008	0.007	0.012	0.0097	0.011	0.003	0.0032	0.0031	0.0024	<0.0020	0.0025	0.0025
Lead	mg/L	0.01	<0.02	< 0.01	<0.01	<0.001	<0.001	<0.001	0.0004	<0.005	0.0002	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.00020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.015	0.0081	<0.040
Mercury	mg/L	0.001	<.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000038	<0.000010	<0.0000050	<0.0000050	0.0000022	<0.0000020
Molybdenum	mg/L	-	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.002	<0.0020	0.0017	<0.0020	<0.0020	0.0009	0.0011
Nickel	mg/L	-	<0.01	0.026	0.021	<0.005	<0.005	<0.005	0.012	0.006	0.005	0.004	0.004	0.012	<0.002	0.012	0.009	0.0103	0.0109	0.008	0.0064	0.0062	0.006	0.0058	0.0060	0.0055
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.0011	0.00079
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.024	0.030	0.030
Zinc	mg/L	5	0.018	0.017	0.007	0.03	<0.01	0.017	0.042	0.037	0.025	0.017	0.019	<0.002	0.035	0.015	0.014	0.0147	0.0113	<0.03	<0.030	0.0098	<0.030	<0.030	0.0077	0.0044

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	6.254
Volume Purged (L)	19 (dry)
Sampling Date	7-Jun-17
Static Water Level (mbtoc)	1.733

Table E12A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 12A																					
			Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																										
Field pH	-	-	7.3	7.02	7.3	7.71	7.78	7.85	7.13	7.61	6.97	7.57	7.67	7.5	7.45	7.52	7.490	7.380	7.79	7.66	7.33	6	7.8	7.6	6.15	7.5
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11.8	26.8 (EF)	9.81	6.98	26.5	27.02	10.670	10.780	2.4	10.84	4.75	13.32	11.38	11.13	15.40	11.64
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.2	7.6	4.3	6.5	6.5	9.95	5.5	5.8	14.1	9.7	6.1	6.2	8.7	5.7	n/a	7.7
Routine Water																										
pH	-	6.5 - 8.5	7.49	7.68	7.67	7.75	7.99	7.87	8.1	8.00	8.00	8.20	8.00	8.30	8.20	7.90	8.1	8.03	8	7.98	8	8.15	8.25	7.75	8.00	8.02
Conductivity (EC)	µS/cm	-	9630	10600	10600	11500	10400	11600	10500	11300	11000	9570	10500	10900	11400	10900	10900	10700	11300	11000	11000	11000	11,000	11,000	11,000	11,000
Calcium	mg/L	-	129	129	137	160	153	154	143	131	158	153	140	143	157	136	150	135	143 *	140	140	130	150	120	150	160
Magnesium	mg/L	-	72.9	80.1	77	94.4	86.5	90.3	84.6	98.7	99.9	95.3	78.8	87	98.5	81.8	91.3	76.7	81.8 *	75	71	72	86	64	82	90
Sodium	mg/L	200	2660	3060	2910	3410	2650	2940	2810	3210	3120	3090	2690	2810	3110	2820	2830	2750	2810 *	2700	3000	2700	3000	2600	2600	2800
Potassium	mg/L	-	8.6	12	9.5	12	8.4	11	8.7	12.8	11.6	11.6	10.7	12.2	13	8.6	5.6	11.6	10.4 *	11	11	9.7	10	10	11	10
Iron	mg/L	0.3	0.14	<0.02	0.02	<0.1	<0.1	<0.1	0.141	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.021	<0.005	<0.050	<0.050 *	<0.06	<0.060	<0.060	<0.60	0.75	<0.060	<0.6
Sulphate	mg/L	500	6020	6250	6580	7840	6360	6630	5970	5970	6350	6240	5690	5570	6010	5760	5700	5680	5470 *	5800	5900	6100	6700	5600	6300	5600
Chloride	mg/L	250	<0.5	0.6	0.8	<0.5	0.8	1.1	1	1	1	2	1	1	3	3	3	1.14	<10 *	3	1.8	1.8	1.9	2.2	1.6	1.3
Bicarbonate	mg/L	-	948	990	938	1020	969	1020	934	1020	976	958	881	904	981	893	965	919	906	850	860	910	900	900	880	950
Carbonate	mg/L	-	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.04	<0.04	0.08	<0.04	<0.08	<0.08	0.2	0.1	<0.1	<0.1	0.1	<0.1	0.3	<0.1	0.3	0.06	<1.0 *	0.067	0.095	0.15	0.11	0.082	0.082	0.87
Nitrite (N)	mg/L	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.05	0.04	<0.16
Nitrate and Nitrate (N)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.13	0.12	0.2
TDS*	mg/L	500	9360	10000	10200	12000	9730	10300	9480	9930	10200	10100	9040	9070	9880	9250	9260	9110	8960	9200	9500	9600	10,000	8900	9600	9200
Water Nutrients																										
Ammonia-N	mg/L	-	0.31	0.11	0.41	0.18	0.35	0.41	0.11	0.12	0.09	0.19	0.27	0.15	<0.05	0.29	<0.05	0.308	<0.050	0.37	0.46	0.27	0.26	0.38	0.21	0.067
TKN	mg/L	-	1.02	0.8	2.31	2.08	2.88	4.22	0.9	0.4	0.8	0.9	1.0	0.8	0.9	0.9	1.6	1.54	1.29	1.2	1.2	0.87	0.89	1.3	0.45	0.7
Hydrocarbons																										
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																										
COD	mg/L	-	44	35	161	98	305	421	30	40	38	39	41	43	39	43	30	35.6	39.8	78	61	53	41	68	48	40
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	14	13.8	14.8	14	15	14	15	16	17	16
Metals																										
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.19	0.0087	<0.0030
Antimony	mg/L	0.006	<0.05	<0.02	<0.02	<0.002	<0.002	<0.002	0.0389	0.0008	0.0007	<0.0004	0.0007	0.0006	<0.0004	0.0010	n/a	n/a	<0.0016 *	<0.01	<0.012	0.00074	<0.0060	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.00097	0.00078
Barium	mg/L	1	0.007	0.0095	0.01	0.014	0.0100	0.0160	0.0130	0.0110	0.0110	0.011	0.013	0.010	0.014	0.009	0.009	0.007	0.0096 *	<0.01	<0.010	<0.010	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.44	0.42	0.46
Cadmium	mg/L	0.005	<0.005	<0.003	<0.003	<0.0001	<0.0001	<0.0001	0.0002	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.001	<0.0010	<0.00020 *	0.0001	<0.10	<0.0001	<0.000050	<0.00040	0.000042	0.000022
Chromium	mg/L	0.05	<0.008	<0.004	<0.004	0.0051	<0.005	<0.005	0.0090	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050 *	<0.02	<0.020	<0.020	<0.010	<0.020	<0.0010	<0.0010
Cobalt	mg/L	-	0.02	0.012	0.017	0.0042	0.0044	0.0077	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020 *	<0.006	<0.0060	<0.0060	<0.0030	<0.0060	0.00048	0.00072
Copper	mg/L	1	<0.01	<0.005	<0.005	0.013	0.0120	0.0140	0.0720	0.0440	0.0300	0.016	0.010	0.011	0.009	0.007	0.014	0.0111	0.0162 *	<0.004	<0.0040	<0.0040	<0.0020	<0.0040	0.0028	0.00074
Lead	mg/L	0.01	<0.02	0.012	<0.01	<0.001	<0.001	<0.001	0.0004	<0.005	0.0001	<0.0001	0.0004	<0.0001	<0.0001	<0.0001	<0.005	<0.0050	<0.00040 *	<0.004	<0.0040	<0.0040	<0.0020	<0.0040	0.00022	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.087	0.055	<0.040
Mercury	mg/L	0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001	<0.00010	<0.00010	<0.000005	0.0000062	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050 *	<0.004	<0.0040	<0.0040	<0.0020	<0.0040	0.00071	0.00076
Nickel	mg/L	-	<0.01	0.017	0.025	0.0066	<0.005	0.015	0.007	<0.002	<0.002	<0.002	0.003	0.006	<0.002	0.008	0.007	0.0067	0.0090 *	<0.01	<0.010	<0.010	<0.0050	<0.010	0.0035	0.007
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.00023	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.0021	0.0023
Zinc	mg/L	5	0.034	0.024	<0.003	0.027	<0.01	0.023	0.059	0.051	0.039	0.034	0.020	0.016	0.042	0.031	0.033	0.0153	0.0176 *	<0.06	<0.060	<0.060	<0.030	<0.060	0.010	0.0042
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Benzo[a]pyrene equivalency	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000010	n/a	n/a
2-methylnaphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	n/a	n/a
Acenaphthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	n/a	n/a
Acenaphthylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	n/a	n/a
Acridine	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	n/a	n/a
Anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	n/a	n/a
Benz(a)anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	n/a	n/a
Benzo(a) pyrene	mg/L	0.00001	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	n/a	n/a
Benzo(b+j)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	n/a	n/a
Benzo(c)phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	n/a	n/a
Benzo(e)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	n/a	n/a
Benzo(g,h,i)perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	n/a	n/a
Benzo(k)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	n/a	n/a
Chrysene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	n/a	n/a
Dibenz(a,h)anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	n/a	n/a
Fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	n/a	n/a
Fluorene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	n/a	n/a
Indeno(1,2,3-c,d)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	n/a	n/a
Naphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	n/a	n/a
Perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	n/a	n/a
Phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	n/a	n/a
Pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000020	n/a	n/a
Quinoline	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	n/a	n/a

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	6.172
Volume Purged (L)	30 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	1.198

Table E12B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 12B																		
			Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun -10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																						
Field pH	-	-	7.63	7.5	7.48	7.64	6.87	7.51	7.51	7.79	7.45	7.69	7.520	7.606	7.76	7.62	7.52	6.17	7.3	7.7	6.28	7.4
Field EC	mS	-	n/a	n/a	n/a	n/a	8.83	18.42 (EF)	7.64	7.78	17.93	18.76	7.600	7.830	3	10.85	4.29	11.9	11.87	11.50	13.83	11.5
Field Temperature	°C	-	n/a	n/a	n/a	n/a	9.4	3.0	8.1	6.7	5.7	10.94	6.4	9.6	8.9	10.2	7.5	7.1	6.9	7.5	n/a	6.3
Routine Water																						
pH	-	6.5 - 8.5	7.82	7.88	8.2	8.2	8.1	8.1	8.2	8.4	8.3	8.0	8.1	8.16	7.95	7.96	7.97	8.14	8.17	7.71	8.00	7.87
Conductivity (EC)	µS/cm	-	7820	8280	8090	7800	7650	7860	7760	7760	7850	7920	7720	7740	11200	11000	9700	10000	11,000	11,000	11,000	11000
Calcium	mg/L	-	138	139	142	99.4	129	118	113	114	123	120	123	103	248 *	250	160	210	380	260	270	280
Magnesium	mg/L	-	25.3	28	29.2	23.3	23.9	21.8	14.8	20.6	22	21.6	22.1	14.5	38.9 *	40	29	37	78	60	54	63
Sodium	mg/L	200	1920	1990	2040	2040	2010	2020	1970	1990	2030	2080	1980	1850	2970 *	2600	2500	2400	3400	2800	2500	2600
Potassium	mg/L	-	4.2	6.6	5.9	7.6	7.2	7.7	7.0	7.8	8.6	5.0	4.2	7.43	10.2 *	10	8	8.2	11	10	11	9.3
Iron	mg/L	0.3	<0.1	<0.1	0.008	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.050	<0.050 *	<0.06	<0.060	<0.060	<0.60	<0.60	0.13	<0.6
Sulphate	mg/L	500	4410	4390	4290	4030	3650	4020	3920	3720	3760	3850	3760	3730	5710 *	6100	5300	5600	6800	6100	5600	5300
Chloride	mg/L	250	1.1	1.6	2	2	2	3	3	3	2	3	3	1.93	<10 *	6	4	3.7	6.2	5.6	6.0	4.6
Bicarbonate	mg/L	-	755	756	739	750	740	741	739	696	748	786	762	738	808	770	760	790	870	850	820	860
Carbonate	mg/L	-	<6	<6	<5	<5	<6	<5	<5	9	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	1	< 0.04	1.3	0.3	0.8	3.4	2.5	1.8	1.8	0.8	2	2.53	1.3 *	1.4	1.8	0.58	0.2	0.12	0.19	<0.22
TDS*	mg/L	500	6880	6930	6880	6570	6190	6570	6400	6210	6320	6470	6280	6080	9380	9400	8400	8700	11,000	9700	8900	8600
Water Nutrients																						
Ammonia-N	mg/L	-	1.16	1.3	1.05	1.4	1.24	0.48	1.56	1.36	0.90	1.46	0.82	0.833	2.23	2.1	1.6	1.7	2.1	2.2	2.1	1.7
TKN	mg/L	-	1.77	2.12	1.4	1.7	1.7	1	2.2	1.5	1.3	1.6	2.1	1.66	3.9	3.5	2.2	2.7	3.3	3.4	2.8	2.8
Hydrocarbons																						
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																						
COD	mg/L	-	22	25	20	20	18	17	19	30	19	21	21	14.9	79.2	98	37	56	71	61	71	52
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7	6.5	25.4	26	14	20	21	22	24	21
Metals																						
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.060	<0.0030	0.0037
Antimony	mg/L	0.006	<0.002	<0.002	0.0094	0.0009	0.0007	<0.0004	0.0006	0.0007	n/a	0.0007	n/a	n/a	<0.0016 *	<0.01	<0.0060	0.00084	<0.0060	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.00088	0.00067
Barium	mg/L	1	0.015	<0.01	0.011	0.012	0.009	0.013	0.018	0.011	0.015	0.011	0.015	0.0137	0.0199 *	0.01	<0.010	<0.010	<0.10	<0.10	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.56	0.57	0.55
Cadmium	mg/L	0.005	<0.0001	<0.0001	0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.001	<0.0010	<0.00020 *	0.0001	<0.050	<0.00010	<0.000050	<0.00040	0.000027	<0.000020
Chromium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050 *	<0.02	<0.010	<0.020	<0.010	<0.020	<0.0010	<0.0010
Cobalt	mg/L	-	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020 *	<0.006	<0.0030	<0.0060	<0.0030	<0.0060	0.00050	0.00034
Copper	mg/L	1	<0.01	<0.01	0.038	0.033	0.024	0.013	0.009	0.007	0.006	0.005	0.009	0.0099	0.0210 *	<0.004	0.0028	<0.0040	<0.0020	<0.0040	0.0023	0.0015
Lead	mg/L	0.01	<0.001	<0.001	0.0025	<0.005	0.0002	0.0001	0.0004	0.0001	<0.0001	0.0004	<0.005	<0.0050	<0.00040 *	<0.004	<0.0020	<0.0040	<0.0020	<0.0040	0.00021	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.43	0.36	0.42
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0000021	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050 *	<0.004	<0.0020	<0.0040	<0.0020	<0.0040	0.00077	0.00052
Nickel	mg/L	-	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	0.004	0.004	0.0039	0.0089 *	<0.01	<0.0050	<0.010	<0.0050	<0.010	0.0030	0.0012
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.00029	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.019	0.021	0.025
Zinc	mg/L	5	<0.01	0.017	0.029	0.025	0.025	0.018	0.017	0.003	0.032	0.049	0.008	0.014	0.0464 *	<0.06	0.037	<0.060	<0.030	<0.060	0.0061	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.686
Volume Purged (L)	26 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	10.686

Table E14: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 14																					
			Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																										
Field pH	-	-	7.7	7.23	7.55	7.46	7.55	7.4	7.45	7.39	6.91	7.29	7.14	7.34	7.21	7.12	7.819	7.454	9.37	7.46	7.4	6	7.5	7.8	7.61	7.6
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.9	6.91 (EF)	2.68	2.79	1.25	6.03	2.650	2.770	5.1	3.08	1.47	4.05	3.81	4.30	4.73	4.8
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.2	7.3	4.5	6.1	4.6	10.88	6.5	5.6	13.5	12.3	7.5	9.4	5.6	7.0	8.5	7.4
Routine Water																										
pH	-	6.5 - 8.5	7.54	7.71	7.84	7.7	7.9	7.79	8.1	8.1	7.9	8.1	8.0	8.1	8.0	7.9	8.1	8.09	8.02	8.05	8.04	8.13	8.14	7.78	8.05	7.9
Conductivity (EC)	µS/cm	-	2610	2670	2820	2790	2640	2590	2630	2750	2460	2220	2560	2580	2720	2770	2670	2760	2710	3000	3300	3400	3500	4000	4600	4700
Calcium	mg/L	-	140	147	99.7	144	129	132	151	106	152	124	144	141	158	145	132	114	116	120	160	150	160	190	230	230
Magnesium	mg/L	-	104	110	81.6	105	86.6	92.2	106	97.6	85.5	101	103	109	120	115	107	86.7	92.4	86	130	130	130	140	190	200
Sodium	mg/L	200	414	408	555	479	470	428	426	419	383	403	390	404	422	435	436	454	413	400	580	490	550	630	690	730
Potassium	mg/L	-	18	24.6	18	23	17	20	17	22	14.6	19.8	19.4	21.7	20.7	21.2	16.3	16.8	18.9	17	22	22	21	22	25	25
Iron	mg/L	0.3	0.16	<0.02	0.04	<0.05	<0.05	<0.05	0.017	0.346	0.009	<0.005	<0.005	<0.0058	0.008	0.012	0.008	<0.0050	<0.010	0.11	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Sulphate	mg/L	500	622	674	626	771	755	730	698	661	553	578	546	566	607	664	635	612	601	790	1000	1100	1300	1500	1900	1900
Chloride	mg/L	250	8.4	7.2	7.2	8	10.4	8.1	8	8	9	5	5	4	4	3	4	2.74	2.64	5	2.5	2.1	2.7	1.7	1.6	1.5
Bicarbonate	mg/L	-	1320	1310	1340	1300	1090	1170	1220	1220	1180	1240	1270	1160	1290	1280	1310	1310	1240	1200	1200	1200	1200	1200	1100	1200
Carbonate	mg/L	-	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	<0.04	<0.02	0.052	<0.04	<0.02	<0.02	<0.1	<0.1	<0.5	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.050	<0.050	0.072	0.024	0.082	0.09	0.091	0.19	7.8
TDS*	mg/L	500	1960	2020	2050	2170	2000	1990	2010	1910	1780	1840	1830	1820	1970	2010	1970	1930	1850	2000	2500	2500	2700	3100	3600	3700
Water Nutrients																										
Ammonia-N	mg/L	-	0.42	0.32	0.65	0.35	0.56	0.45	0.39	0.42	0.26	0.41	0.31	0.40	0.29	0.41	0.3	0.42	0.454	0.29	0.4	0.37	0.37	0.53	0.35	0.2
TKN	mg/L	-	1.3	1.13	1.88	1.14	2.93	2.34	1.2	0.8	1.1	1.2	1.1	1	0.9	1	1	1.39	1.58	1.7	1.1	1	1.1	1.1	0.91	0.8
Hydrocarbons																										
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																										
COD	mg/L	-	35	25	36	30	146	50	30	20	30	29	31	28	27	29	25	24.3	27.8	54	37	52	37	34	34	25
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10	9.2	10.5	11	9.8	9.7	8.6	9.6	11	8.2
Metals																										
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.006	<0.05	<0.02	<0.02	<0.001	0.0014	<0.001	0.0015	0.0014	0.0007	<0.0004	0.0010	0.0011	<0.0004	0.0008	n/a	n/a	<0.00040	<0.0006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00077	0.00069	0.00054
Barium	mg/L	1	0.064	0.0645	0.085	0.064	0.1	0.066	0.055	0.058	0.19	0.108	0.109	0.062	0.094	0.078	0.105	0.0664	0.0829	0.084	0.1	0.087	0.066	0.052	0.042	0.040
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.12	0.13	0.14
Cadmium	mg/L	0.005	<0.005	<0.003	<0.003	<0.00005	<0.00005	< 0.00005	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0010	<0.000050	<0.000025	<0.	0.000068	0.00003	<0.000020	0.000025	0.000029
Chromium	mg/L	0.05	<0.008	<0.004	<0.004	0.0049	0.006	< 0.002	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.001	<0.025	<0.0010	<0.001	<0.0010	<0.0010	<0.001
Cobalt	mg/L	-	0.007	0.0045	0.006	0.0006	<0.0005	< 0.0005	<0.002	<0.002	0.003	<0.002	0.002	0.002	<0.002	<0.002	0.002	<0.0020	0.0032	0.003	0.0021	0.002	0.0018	0.0017	0.0019	0.0018
Copper	mg/L	1	<0.01	<0.005	0.008	<0.005	<0.005	< 0.005	0.004	0.013	0.005	0.004	0.003	0.003	0.001	0.002	0.002	0.0024	0.002	0.0003	<0.0010	0.0014	0.00087	<0.00020	0.00045	0.00084
Lead	mg/L	0.01	<0.02	<0.01	< 0.01	<0.0005	<0.0005	< 0.0005	<0.0001	<0.005	<0.0001	<0.0001	0.0005	<0.0001	<0.0001	0.0001	<0.005	<0.0050	<0.00010	<0.0002	<0.0010	0.0005	<0.0002	<0.00020	<0.00020	<0.0002
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.62	0.63	0.57
Mercury	mg/L	0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000049	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	<0.01	<0.005	0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.0050	<0.0050	0.0006	<0.0010	0.0008	0.0016	0.00068	0.00074	0.00059
Nickel	mg/L	-	<0.01	0.014	0.015	<0.003	<0.0025	< 0.0025	<0.002	0.002	0.005	0.004	0.005	0.006	0.005	0.007	0.007	0.0061	0.0084	0.0062	0.0042	0.0047	0.0044	0.0033	0.0031	0.0031
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0008	0.0011	0.00075
Zinc	mg/L	5	0.024	0.0315	<0.003	0.007	<0.005	< 0.005	0.006	0.012	0.011	0.004	0.009	<0.002	0.008	0.009	0.009	0.013	0.0048	0.005	<0.015	0.01	0.0059	<0.0030	<0.0030	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	7.085
Volume Purged (L)	20 (dry)
Sampling Date	7-Jun-17
Static Water Level (mbtoc)	1.750

Table E18A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 18A									
			May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements												
Field pH	-	-	8.5	8.377	8.21	8.34	8.31	6.09	8.4	8.8	6.75	8.5
Field EC	mS	-	1.386	1.500	13.4	1.56	1.614	1.80	15.82	1.64	1.916	1517
Field Temperature	°C	-	6.6	8.0	14.1	10.9	7.6	6.79	6.4	6.6	8.3	8.7
Routine Water												
pH	-	6.5 - 8.5	8.5	8.51	8.39	8.45	8.52	8.58	8.61	8.39	8.44	8.5
Conductivity (EC)	µS/cm	-	1470	1500	1490	1500	1500	1,500	1500	1500	1500	1500
Calcium	mg/L	-	4.1	4	4.43	3.8	3.8	3.1	3	2.7	3.0	2.9
Magnesium	mg/L	-	0.9	0.52	0.58	0.4	0.39	0.36	<2.0	0.30	0.34	0.31
Sodium	mg/L	200	375	380	389	400	380	360	390	360	380	380
Potassium	mg/L	-	1.2	1.45	1.46	1.5	1.4	1.3	<3.0	1.3	1.5	1.4
Iron	mg/L	0.3	0.108	0.0364	0.045	<0.06	<0.060	<0.060	<0.60	<0.060	0.11	<0.060
Sulphate	mg/L	500	5.7	1.42	<0.50	2	<1.0	2.0	2.4	1.4	6.9	2.1
Chloride	mg/L	250	8	6.18	5.75	7	6.7	6.2	7.3	7.2	7.4	7.3
Bicarbonate	mg/L	-	1010	1000	991	960	960	980	970	1000	950	1000
Carbonate	mg/L	-	29	28.1	18.9	17	26	30	38	8.9	9.5	17
Nitrate (N)	mg/L	10	<0.1	<0.050	<0.050	0.12	<0.0030	<0.003	<0.010	<0.010	0.011	<0.044
TDS*	mg/L	500	922	914	908	910	900	890	920	880	870	910
Water Nutrients												
Ammonia-N	mg/L	-	0.54	0.598	0.231	0.64	0.64	0.62	0.62	0.64	0.66	0.72
TKN	mg/L	-	0.9	1.13	1.28	1.1	1	1.1	1.1	0.98	0.90	0.94
Hydrocarbons												
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics												
COD	mg/L	-	6	18.4	22.4	34	24	34	29	28	27	26
DOC	mg/L	-	8	6.7	8.5	7.9	7.2	6.5	5.2	6.9	6.9	7.2
Metals												
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0046	0.029	0.0045
Antimony	mg/L	0.006	n/a	n/a	0.0004	<0.006	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0010	0.00092	0.001
Barium	mg/L	1	0.124	0.0834	0.117	0.1	0.095	0.098	<0.10	0.089	0.091	0.1
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.78	0.81	0.83
Cadmium	mg/L	0.005	<0.001	<0.0010	0.00007	<0.00005	0.000024	<0.000025	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.0050	<0.0050	<0.01	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.0020	<0.0020	<0.003	0.00056	0.00045	0.00067	0.00031	0.00031	<0.00030
Copper	mg/L	1	<0.001	0.0015	0.0032	<0.002	0.00059	0.00039	0.00057	0.00025	0.00023	0.00038
Lead	mg/L	0.01	<0.005	<0.0050	0.00013	<0.002	<0.00020	<0.00020	0.00033	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.045	0.059	0.04
Mercury	mg/L	0.001	n/a	<0.00010	<0.00010	<0.000005	<0.002	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.026	0.0058	0.0088	0.004	0.0046	0.0047	0.0048	0.0043	0.0043	0.0043
Nickel	mg/L	-	0.003	0.01	0.0121	0.006	0.0043	0.0036	0.0044	0.0039	0.0035	0.0024
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00026	0.00013	0.00026
Zinc	mg/L	5	0.003	0.0111	0.0079	<0.03	0.0038	<0.0030	0.0033	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.704
Volume Purged (L)	39 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	1.925

Table E18B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 18B									
			May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements												
Field pH	-	-	7.302	7.263	7.21	7.34	7.06	6.04	7.6	8.0	6.00	7.4
Field EC	mS	-	6.08	6.04	1.05	6.33	3.10	4.92	2.92	3.80	4.24	3160
Field Temperature	°C	-	5.7	6.9	7	7	7.2	11.6	8.9	5.9	8.3	8
Routine Water												
pH	-	6.5 - 8.5	8	7.9	7.93	7.8	7.92	8.11	8.27	7.79	7.96	8.05
Conductivity (EC)	µS/cm	-	6020	6270	6460	6200	6900	4200	2900	3600	3400	3000
Calcium	mg/L	-	511	524	519	450	540	230	120	190	180	180
Magnesium	mg/L	-	134	116	135	120	150	57	33	47	45	48
Sodium	mg/L	200	1110	1250	1020	1100	1300	690	510	670	570	530
Potassium	mg/L	-	3.6	8.42	7.08	7.4	8.4	4.9	3.7	4.6	4.5	4.4
Iron	mg/L	0.3	0.007	0.0177	0.021	<0.06	<0.060	<0.060	<0.060	<0.060	0.25	<0.060
Sulphate	mg/L	500	3230	3380	3420 *	3300	3700	2200	1400	1700	1500	1100
Chloride	mg/L	250	22	19.5	<10 *	48	3.5	17	14	17	22	29
Bicarbonate	mg/L	-	846	838	880	780	980	400	350	410	390	760
Carbonate	mg/L	-	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.1	<0.050	<1.0 *	0.23	0.016	0.2	0.2	0.13	0.089	0.36
TDS*	mg/L	500	5430	5710	5530	5400	6200	3400	2300	2800	2600	2200
Water Nutrients												
Ammonia-N	mg/L	-	0.16	0.507	0.052	0.63	0.48	0.23	0.09	0.14	0.10	0.17
TKN	mg/L	-	1.2	1.38	1.96	1.3	1.2	1.1	0.68	1.5	0.32	0.87
Hydrocarbons												
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics												
COD	mg/L	-	28	27.6	21.4	60	53	34	27	64	30	24
DOC	mg/L	-	11	11.3	9.3	11	8.9	9.3	7.3	9.2	8.2	11
Metals												
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0034	0.11	0.0062
Antimony	mg/L	0.006	n/a	n/a	<0.00040	<0.006	<0.0060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0004	0.00041	0.00037
Barium	mg/L	1	0.016	0.0117	0.0173	0.01	0.012	0.011	0.017	0.012	0.014	0.016
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.071	0.075	0.062
Cadmium	mg/L	0.005	<0.001	<0.0010	<0.000050	<0.000050	0.000053	0.00004	<0.000025	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.0020	<0.0020	<0.003	<0.0030	0.0005	0.00039	0.00041	0.00031	0.00039
Copper	mg/L	1	0.009	0.0072	0.009	0.003	<0.0020	0.0014	0.0012	0.0007	0.0013	0.00064
Lead	mg/L	0.01	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.00020	<0.0002	<0.00020	0.00037	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.15	0.046	0.15
Mercury	mg/L	0.001	n/a	<0.00010	<0.00010	<0.000005	0.0000033	<0.0000050	<0.0000050	<0.0000050	0.0000068	<0.0000020
Molybdenum	mg/L	-	<0.005	<0.0050	<0.0050	<0.002	<0.0020	0.0009	0.0011	0.00074	0.00072	0.00066
Nickel	mg/L	-	0.015	0.0136	0.0123	0.005	0.0053	0.0039	0.0035	0.0039	0.0044	0.004
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0011	0.00091	0.0044
Zinc	mg/L	5	0.011	0.0102	0.0041	<0.03	<0.030	0.005	<0.0030	<0.0030	0.0047	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	5.992
Volume Purged (L)	27 (Dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	1.240

Table E19A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 19A																														
			Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																																	
Field pH	-	-	8.6	8.8	n/a	8.1	7.11	7.95	7.25	7.96	n/a	n/a	8	n/a	8.14	8.14	8.18	7.57	7.94	7.18	7.29	7.13	7.83	7.61	7.88	7.633	7.622	7.68	7.8	7.47	5.23	8.2	7.7	7.97	7.6
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5.83	13.76 (EF)	5.33	5.1	16.05	15.29	7.140	7.360	1.444	8.19	3.67	7.94	6.35	7.87	8.51	6000
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.9	2.9	9.2	6.3	6.3	9.46	6.1	8.1	9.8	9.3	7.5	8.2	8.7	6.3	n/a	7.7
Routine Water																																			
pH	-	6.5 - 8.5	8.46	8.42	8.42	8.44	8.13	7.99	8.51	8.65	n/a	n/a	8.12	n/a	8.13	8.19	8.17	8.3	8.3	8.2	8.2	8.2	8.5	8.4	8.1	8.2	8.18	8.26	8.07	8.11	8.45	8.09	7.99	8.25	8.31
Conductivity (EC)	µS/cm	-	4310	3060	2570	3120	5310	4470	4690	3320	n/a	n/a	4370	n/a	4700	3570	4880	5940	5640	5730	6080	5700	6240	7070	7250	7270	7200	7750	8100	8300	6200	7900	7500	6900	6900
Calcium	mg/L	-	33.2	10.9	21	19	36.7	26.7	36.9	16.1	n/a	n/a	25.6	n/a	28	15	36.3	47.5	18.7	49.8	35.9	49.6	52.0	68.1	69.8	78.4	67.1	83.4	78	85	32	90	62	55	57
Magnesium	mg/L	-	17.5	1.5	19.8	12.4	12.5	6.4	19.2	8.27	n/a	n/a	4.31	n/a	4.2	2.4	5.6	16.9	7.4	13.2	10.5	8.2	17.9	27.2	30.0	32.8	34.2	25.4	44	46	20	42	37	32	32
Sodium	mg/L	200	1080	729	785	776	1470	1360	1390	839	n/a	n/a	1090	n/a	1200	1050	1320	1590	1440	1490	1500	1470	1530	1800	1830	1860	1740	1810	2000	2300	1500	2200	1900	1500	1700
Potassium	mg/L	-	13.6	4.68	22.5	9.12	6.92	5.22	10.3	5.7	n/a	n/a	4.3	n/a	4	2.9	5.2	4.3	5.2	5.7	6.2	6.1	7.1	8.7	7.2	5.2	8.6	7.54	11	11	7.7	8.9	9.4	8.9	8.6
Iron	mg/L	0.3	37.3	0.26	20.5	66.9	1.76	0.166	n/a	n/a	n/a	n/a	0.057	n/a	<0.05	0.07	<0.1	0.105	<0.005	0.011	0.006	0.018	0.025	0.006	0.011	<0.005	<0.050	<0.030 *	<0.06	<0.060	0.13	<0.60	<0.060	<0.060	<0.60
Sulphate	mg/L	500	1660	867	655	633	2200	1750	1880	728	n/a	n/a	1480	n/a	1720	1060	1870	2470	2240	2170	2480	2340	2410	2930	3230	3150	3180	3360	3900	3900	2600	3700	3400	3000	2800
Chloride	mg/L	250	11.8	10.9	9.9	36.5	1.8	10.8	5.4	7.8	n/a	n/a	4.7	n/a	3.4	5.5	4.1	6	6	7	8	7	8	7	9	9	8.32	<10 *	11	10	3.1	8.8	8.9	6.7	7.4
Bicarbonate	mg/L	-	749	887	1150	1230	1250	1200	1100	1080	n/a	n/a	1250	n/a	1190	1300	1200	1160	1170	1170	1150	1190	1100	1160	1170	1210	1190	1160	1100	1200	1100	1200	1200	1100	1200
Carbonate	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	57	79	n/a	n/a	<6	n/a	<6	<6	<6	<5	<5	<5	<5	<5	31	21	<5	<5	<5.0	<5.0	<0.5	<0.50	25	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	n/a	n/a	n/a	n/a	1.55	1.26	1.02	9.04	n/a	n/a	3.01	n/a	1.43	4.93	2.36	1.2	0.2	0.4	5.1	<0.1	0.2	0.6	0.9	0.9	<0.050	<1.0 *	0.15	0.2	0.02	0.15	0.023	<0.050	0.16
TDS*	mg/L	500	3210	2070	2100	2140	4340	3740	3940	2220	n/a	n/a	3230	n/a	3540	2770	3840	4710	4290	4310	4630	4470	4600	5440	5760	5740	5620	5620	6600	6900	4700	6700	6000	5200	5200
Water Nutrients																																			
Ammonia-N	mg/L	-	1.62	1.58	0.23	0.78	0.88	1.1	1.39	0.71	n/a	n/a	0.32	n/a	0.8	0.22	0.18	0.57	0.88	0.86	0.43	1.25	1.11	0.78	0.69	0.46	0.736	0.982	0.66	0.69	0.82	0.98	0.43	0.49	0.76
TKN	mg/L	-	25.8	9.91	5.66	2.72	1.28	2.21	1.97	2.16	n/a	n/a	1.11	n/a	2.12	2.52	1.05	0.8	1.3	1.4	2.1	1.4	1.7	1.1	1.3	1.1	1.31	1.93	1.1	1.2	1	1.4	0.80	0.96	1.1
Hydrocarbons																																			
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																																			
COD	mg/L	-	3580	1660	526	402	71	n/a	180	131	114	n/a	n/a	22	n/a	171	227	146	20	10	25	18	18	20	20	16	14	13.7	20	25	28	22	20	25	19	27
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7	6.8	7.7	8.1	7.3	6.8	6	7.5	7.1	7.1
Metals																																			
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0072	<0.0030
Antimony	mg/L	0.006	<0.005	n/a	n/a	n/a	<0.005	<0.005	n/a	n/a	n/a	n/a	<0.02	n/a	0.001	0.0012	0.0012	0.001	0.0018	0.001	0.0008	0.0008	0.0007	0.0006	0.0012	n/a	n/a	0.00068	<0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00065	0.00054
Barium	mg/L	1	0.0625	n/a	n/a	n/a	0.0858	0.0377	n/a	n/a	n/a	n/a	0.0225	n/a	0.023	0.019	0.021	0.031	0.029	0.026	0.026	0.027	0.021	0.037	0.023	0.035	0.0155	0.0387	0.02	0.013	0.028	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.40	0.41	0.43
Cadmium	mg/L	0.005	<0.0005	n/a	n/a	n/a	<0.0005	<0.005	n/a	n/a	n/a	n/a	<0.003	n/a	<0.00005	<0.00005	0.0000	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.001	<0.0010	0.000115	0.00008	0.000092	<0.000050	0.000055	<0.00020	0.000039	<0.000020
Chromium	mg/L	0.05	0.0024	n/a	n/a	n/a	0.0033	<0.0008	n/a	n/a	n/a	n/a	<0.004	n/a	0.0043	0.0065	0.0018	<0.005	<0.005	<0.005	0.007	<0.0005	<0.0005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0012	n/a	n/a	n/a	0.003	0.0059	n/a	n/a	n/a	n/a	0.0085	n/a	0.0009	<0.0005	0.0012	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.0020	0.0026	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.00042	0.00043
Copper	mg/L	1	<0.001	n/a	n/a	n/a	0.002	0.001	n/a	n/a	n/a	n/a	<0.005	n/a	0.005	< 0.005	0.005	0.014	0.017	0.015	0.011	0.006	0.007	0.006	0.006	0.006	0.0056	0.0087	<0.002	0.0043	<0.0020	<0.0020	<0.0020	0.0014	0.00041
Lead	mg/L	0.01	<0.002	n/a	n/a	n/a	<0.002	<0.002	n/a	n/a	n/a	n/a	<0.01	n/a	<0.0005	<0.0005	0.0003	<0.005	<0.005	0.0002	<0.0001	<0.0001	0.0003	0.0001	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.39	0.36	0.4
Mercury	mg/L	0.001	n/a	n/a	<0.0001	<0.0001	<0.0001	n/a	n/a	n/a	n/a	n/a	<0.0001	n/a	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	0.0016	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	0.0000082	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.082	n/a	n/a	n/a	0.005	0.005	n/a	n/a	n/a	n/a	0.005	n/a	0.007	0.009	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.021	<0.0050	<0.0050	<0.002	<0.0020	0.0037	0.0022	<0.0020	0.0016	0.0016
Nickel	mg/L	-	0.008	n/a	n/a	n/a	0.004	0.002	n/a	n/a	n/a	n/a	0.008	n/a	0.0039	<0.0025	0.0072	<0.002	0.003	0.003	0.007	0.003	0.005	0.008	0.008	0.009	0.005	0.0111	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0028	0.0017
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.005	0.006	0.006
Zinc	mg/L	5	0.0013	n/a	n/a	n/a	0.0039	0.0021	n/a	n/a	n/a	n/a	0.022	n/a	0.008	0.007	0.009	0.02	0.018	0.019	0.012	0.019	0.023	0.014	0.019	0.006	0.0078	0.017	<0.03	<0.030	<0.030	<0.030	<0.030	0.0082	<0.0030

Notes:
[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)
Information not available (n/a)
Total Dissolved Solids, not a measured value (TDS)
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.71
Volume Purged (L)	34 (Dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	0.805

Table E19B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW19B									
			May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements												
Field pH	-	-	7.453	7.514	bent	7.65	7.75	5.32	7.5	8.4	8.09	8.2
Field EC	mS	-	6.390	6.480	bent	6.24	2.81	7.51	8.08	6.26	7.17	6430
Field Temperature	°C	-	6.2	7.9	bent	10.7	7.9	8	8.3	6.5	n/a	7
Routine Water												
pH	-	6.5 - 8.5	8.2	8.13	8.08	8.1	8.4	8.27	8.33	8.26	8.43	8.5
Conductivity (EC)	µS/cm	-	6290	6430	6370	6200	6500	8200	6000	5900	5700	5800
Calcium	mg/L	-	68.6	62.6	63.2	62	61	77	29	32	31	29
Magnesium	mg/L	-	27.7	25.1	23.3	23	25	35	20	17	17	18
Sodium	mg/L	200	1580	1470	1440	1500	1800	2000	1500	1500	1300	1400
Potassium	mg/L	-	6.3	8	8.35	8.9	8.8	8.7	6.7	7.4	7.6	7.5
Iron	mg/L	0.3	<0.005	<0.050	0.022	<0.06	0.26	<0.060	<0.60	0.36	0.21	<0.6
Sulphate	mg/L	500	2630	2700	2530	2600	2800	3700	2600	2400	2200	2000
Chloride	mg/L	250	5	3.64	<10 *	4	4.2	9.8	2.6	3.1	3.1	2.7
Bicarbonate	mg/L	-	1140	1130	1110	1100	1100	1200	1100	1100	1000	1100
Carbonate	mg/L	-	<5	<5.0	<5.0	<0.5	19	<0.50	5	<0.50	13	22
Nitrate (N)	mg/L	10	<0.1	0.279	<1.0 *	0.032	0.015	0.21	<0.010	<0.010	0.015	<0.044
TDS*	mg/L	500	4880	4830	4610	4800	5200	6500	4700	4500	4100	4100
Water Nutrients												
Ammonia-N	mg/L	-	0.64	0.382	0.569	0.64	0.73	1	0.76	0.76	0.73	0.84
TKN	mg/L	-	1	0.8	1.51	1.6	1.1	1.6	1.1	1.1	1.1	1.0
Hydrocarbons												
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.0006	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics												
COD	mg/L	-	n/a	13.7	10.8	86	22	27	28	17	17	17
DOC	mg/L	-	n/a	5.2	6.1	6.1	5.9	8.2	5	5.7	6.0	6.3
Metals												
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	<0.0030	0.0034
Antimony	mg/L	0.006	n/a	n/a	<0.00040	<0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0021	0.0025	0.0017
Barium	mg/L	1	n/a	0.0148	0.0188	0.02	0.019	0.02	<0.10	0.027	0.029	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.47	0.48	0.52
Cadmium	mg/L	0.005	<0.001	<0.0010	<0.000050	<0.00005	<0.050	0.00011	<0.000050	<0.00020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	0.0010	<0.001
Cobalt	mg/L	-	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.0003	<0.00030
Copper	mg/L	1	0.005	0.0062	0.0071	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00023	<0.00020
Lead	mg/L	0.01	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.21	0.21	0.19
Mercury	mg/L	0.001	n/a	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.007	<0.0050	<0.0050	<0.002	<0.0020	0.0021	0.0029	<0.0020	0.0020	0.0016
Nickel	mg/L	-	0.005	0.0041	0.0057	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0025	<0.00050
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0010	0.00021	0.00024
Zinc	mg/L	5	0.012	0.0094	0.0046	<0.030	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Pipe is bent and was unable to measure water elevation (bent)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	5.335
Volume Purged (L)	27
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	0.887

Table E20A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 20A																														
			Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements																																	
Field pH	-	-	8.1	8.3	n/a	8.1	7.5	7.91	7.63	7.62	7.8	7.93	7.8	7.98	8.04	7.85	7.78	7.74	7.67	7.67	7.61	7.38	7.73	7.5	8.09	7.747	7.400	8.250	7.710	7.63	n/a	8.0	8.2	8.6	7.8
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.28	9.81 (EF)	4.27	3.62	7.94	7.74	4.050	2	2.9	3.4	1.999	3.98	3.5	3.31	3.57	3
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12.3	3.7	7.5	6.4	7.7	11.46	7.9	11.2	15.5	10	8.7	8.4	7.8	7.9	8.1	6.9
Routine Water																																	
pH	-	6.5 - 8.5	8.26	8.07	8.24	8.43	8.36	8.25	8.17	8.46	8.12	7.96	8.1	7.95	8.08	8.11	8.28	8.3	8.3	8.2	8.2	8.3	8.4	8.4	8.2	8.3	8.38	8.25	8.25	8.37	8.4	8.05	8.03	8.15	8.34
Conductivity (EC)	µS/cm	-	3660	3730	2950	3210	3160	3510	3410	3250	3290	3320	3330	3210	3230	3480	3670	3880	3920	3840	3900	3480	3500	3310	3310	4110	3650	3440	3400	3400	3400	3300	3100	3300	3200
Calcium	mg/L	-	71.5	34.3	28.3	20.7	16.7	17.1	24.9	19.3	21.3	23.9	18.7	20.5	17	25.1	30.5	42.4	11.5	42	14.7	26.2	25.6	20.6	20.6	48.6	27.1	23.5	18	22	19	19	18	19	18
Magnesium	mg/L	-	13.8	8	6.6	5	2.6	2.9	7.3	6.29	3.44	4.25	3.2	3.49	2.9	3.5	5.2	8.4	6.3	6.8	10.2	4.0	4.4	2.6	2.2	13.8	5.01	3.66	2.5	2.9	2.6	2.7	2.4	2.5	2.4
Sodium	mg/L	200	870	924	912	773	797	798	908	775	753	933	714	903	748	879	934	984	934	944	966	862	870	824	866	980	841	792	850	930	800	800	750	830	780
Potassium	mg/L	-	8.93	8.67	8.88	8.35	4.39	5.29	8.73	7.3	3.5	4.8	3.6	3.9	2.6	3	4	4.3	4.7	4.5	6.1	3.9	4.4	4.7	3.4	3.8	2.86	3.71	3	3.8	3.3	3.3	3.5	3.3	2.9
Iron	mg/L	0.3	0.16	6.73	43.9	1.65	0.026	n/a	2.2	n/a	0.022	1.02	0.059	0.908	<0.05	0.06	<0.05	0.097	<0.005	0.011	<0.005	0.014	0.011	<0.005	0.006	<0.005	<0.0050	0.017	<0.06	<0.060	<0.060	0.44	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1450	1360	1110	830	749	849	960	784	945	1030	804	957	784	1140	1290	1220	1150	1200	1300	1040	900	772	789	1340	1040	835	830	830	800	800	680	740	660
Chloride	mg/L	250	14	8.6	8.2	22.6	11.1	12.1	6.7	11.7	8.4	5.2	4.6	6.3	5.9	4.5	2.4	3	4	4	4	6	6	7	8	8	6.22	5.6	8	6.9	6.7	6.9	8.3	7.0	7.9
Bicarbonate	mg/L	-	612	797	997	1030	1090	1140	1120	1050	1140	1120	1150	1160	1190	1130	1100	1130	1130	1130	1110	1140	1120	1210	1260	1110	1150	1180	1200	1200	1200	1300	1200	1300	1200
Carbonate	mg/L	-	n/a	n/a	n/a	n/a	17.9	n/a	n/a	46	<6	<6	<6	<6	<6	<6	<6	<5	7	<5	<5	<5	24	16	<5	<5	17.5	<5.0	<0.5	15	18	<0.50	<0.50	<0.50	5.5
Nitrate (N)	mg/L	10	n/a	n/a	n/a	n/a	2.31	1.88	4.02	3.36	3.9	4.4	3.92	3.89	3.06	3.82	2.56	1.9	1.1	0.8	3	4.4	1.9	4.3	4.1	6.1	3.27	6.28	6.9	1.8	3.4	1.8	6.6	3.1	21
TDS*	mg/L	500	2720	2740	2560	2200	2130	2240	2470	2170	2270	2550	2110	2470	2150	2610	2800	2830	2680	2760	2860	2520	2400	2260	2330	2970	2520	2270	2300	2400	2300	2300	2100	2200	2100
Water Nutrients																																	
Ammonia-N	mg/L	-	0.788	1.05	1.4	1.16	0.92	1.59	0.75	0.95	0.58	0.12	0.32	0.3	0.34	0.24	0.28	0.08	0.5	0.36	0.15	0.14	0.57	0.5	0.28	0.38	0.151	0.22	0.41	0.49	0.55	0.33	0.23	0.53	0.3
TKN	mg/L	-	5.53	6.08	2.34	4.22	1.71	2.44	1.92	2.8	1.87	1.09	0.19	1.18	2.24	1.29	1.28	< 0.2	0.7	0.7	0.4	0.4	0.6	1.2	0.8	1.1	n/a	0.87	1.1	1	1.3	1	0.93	1.2	1.0
Hydrocarbons																																	
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																																	
COD	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<5.0	38	45	75	66	28	19	35
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5.5	9.6	5.9	5.2	4.4	5.7	4.3	6.4
Metals																																	
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0052	0.0040	0.0078
Antimony	mg/L	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.006	<0.006	<0.05	<0.02	<0.02	<0.001	<0.001	<0.002	0.0007	0.0026	0.0009	<0.0004	0.0006	0.0006	<0.0004	0.0007	n/a	n/a	<0.0040	<0.0006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00037	0.00051	0.0004
Barium	mg/L	1	0.0848	0.0465	0.0337	0.0642	0.0417	0.04	0.0309	0.0249	0.0243	0.024	0.0335	0.023	0.025	0.021	0.024	0.024	0.025	0.021	0.028	0.022	0.016	0.017	0.018	0.045	0.0252	0.0245	0.018	0.022	0.021	0.025	0.015	0.018	0.027
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.80	0.92	0.79
Cadmium	mg/L	0.005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	n/a	<0.0005	n/a	<0.0006	<0.003	<0.003	<0.0005	<0.00005	<0.00005	<0.00005	<0.001	< 0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0010	<0.000050	0.00005	0.000066	0.000031	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	0.001	0.0009	n/a	0.0009	0.0017	n/a	0.0014	n/a	<0.0009	<0.004	<0.004	<0.0008	0.0044	0.0059	<0.002	<0.005	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.001	<0.0050	<0.0010	0.0019	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0021	0.0018	n/a	0.0011	0.0029	n/a	0.0028	n/a	0.0032	0.0072	0.006	0.0027	0.0014	0.0018	0.0029	<0.002	< 0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0003	<0.0015	<0.00030	0.00057	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	0.001	0.004	n/a	0.003	0.004	n/a	0.005	n/a	0.002	<0.006	0.005	0.004	<0.005	<0.005	<0.005	0.008	0.012	0.009	0.005	0.006	0.003	0.002	0.002	0.003	0.0043	0.0039	0.0023	0.0025	0.0016	0.0036	0.00075	0.00038	0.00031
Lead	mg/L	0.01	<0.002	<0.002	n/a	0.006	0.002	n/a	0.002	n/a	<0.002	<0.01	<0.01	<0.002	<0.0005	<0.0005	<0.0005	<0.005	< 0.005	0.0002	<0.0001	0.0062	<0.0001	<0.0001	0.0002	<0.005	<0.0050	<0.00010	<0.0002	<0.0010	<0.00020	0.0003	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.026	0.026	0.031
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	n/a	<0.0001	n/a	<0.0001	<0.0001	<0.0001	n/a	<0.0001	<0.0001	<0.0001	<0.0001	< 0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0000050	<0.0000050	<0.0000020
Molybdenum	mg/L	-	14.5	0.024	n/a	0.005	0.009	n/a	0.006	n/a	0.004	0.006	<0.005	0.003	<0.005	<0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.014	<0.0050	<0.0050	0.0017	0.0018	0.0018	0.0016	0.0016	0.0014	0.0015
Nickel	mg/L	-	0.011	0.011	n/a	0.008	0.004	n/a	0.006	n/a	0.003	<0.006	0.009	0.003	0.0041	<0.003	0.0097	<0.002	< 0.002	<0.002	<0.002	0.003	0.002	<0.002	0.002	0.003	0.0047	<0.0020	0.0017	<0.0025	0.0016	0.0031	0.0015	0.0011	0.0014
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	0.0014	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	0.0016	0.0015
Zinc	mg/L	5	0.0068	0.0272	n/a	0.0131	0.0218	n/a	0.0249	n/a	0.0241	0.029	0.026	0.0128	0.008	<0.005	0.008	0.02	0.019	0.013	0.01	0.030	<0.002	0.010	0.031	0.009	0.0496	0.0039	0.014	0.017	0.0084	0.0036	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.620
Volume Purged (L)	31 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	3.718

Table E20B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 20B																															
			Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																																		
Field pH	-	-	7.6	7.4	n/a	7.6	7.11	7.28	7.22	7.66	7.49	7.52	7.49	7.54	7.65	7.63	7.75	7.81	7.49	7.33	7.23	7.33	7.47	7.56	7.55	7.631	7.487	8.9	7.54	7.41	5.32	7.9	7.9	7.64	7.6
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.41	4.51	4.29	10.49	10.94	4.570	4.400	2.7	4.59	1.97	5.35	5.32	5.03	4.97	5.18
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10.4	7.5	5.80	8.90	6.0	11.60	6.8	8.7	12	10.1	6.9	7.1	7.9	5.5	7.3	6.2
Routine Water																																		
pH	-	6.5 - 8.5	7.79	7.8	7.87	7.71	7.71	7.63	7.8	7.84	7.78	7.76	7.8	7.68	7.81	7.84	7.99	8.2	8.2	8.1	8.2	8.1	8.2	8.1	8.0	8.2	8.13	8.22	8.13	8.14	8.19	8.02	8.04	8.04	8.17
Conductivity (EC)	µS/cm	-	4150	4220	3380	4130	4310	4000	4180	4420	4050	4050	4160	4260	4220	4150	4010	4270	4320	4160	3910	4290	4370	4700	4480	4660	4450	4620	4700	4600	4600	4900	4700	4700	5000
Calcium	mg/L	-	91.1	54.8	91.6	90.7	21.8	90.8	95.1	102	84.4	94.2	90.2	95.1	94.6	102	89.9	79.5	43.8	100	81.6	105	104	130	109	138	108	116	100	110	110	130	120	110	140
Magnesium	mg/L	-	29	29.9	27.9	27	33.7	29.5	30.8	31.1	29.5	31.1	31.2	32.5	31.4	34.7	27.6	34.4	32.3	31.5	35	33.2	9.4	46.5	37.2	50.6	35.3	39.6	36	34	39	47	39	37	50
Sodium	mg/L	200	975	1020	1080	975	1080	967	1030	1080	926	929	924	1020	1110	959	943	1010	1000	978	1060	975	995	1050	1040	1030	1070	936	1000	1100	960	1000	1000	1000	1100
Potassium	mg/L	-	9.34	8.43	8.9	7.43	9.86	8.08	12.8	8.7	9.8	7.1	8.7	8.7	9.2	7.6	7.6	6.9	9.3	7.6	9.5	8.4	9.4	10.2	9.6	7.4	10.3	9.17	8	9.2	8.7	9.4	9.0	9.0	9.8
Iron	mg/L	0.3	<0.04	0.15	0.004	0.387	0.088	0.623	0.019	0.047	<0.003	0.055	<0.02	0.072	<0.05	<0.05	<0.1	0.183	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	0.013	<0.005	0.0216	0.018	<0.06	<0.060	<0.060	0.24	<0.060	<0.60	<0.60
Sulphate	mg/L	500	1520	1580	1770	1450	1750	1570	1730	1720	1860	1590	1590	1720	1820	1710	1670	1630	1610	1560	1610	1580	1600	1790	1710	1890	1680	1780 *	1800	1800	1900	2200	1900	1800	1900
Chloride	mg/L	250	1.7	0.4	1	1.3	<0.5	0.7	<0.5	<0.5	1.7	<0.5	0.8	0.8	<0.5	0.8	<0.5	1	2	2	3	2	2	2	2	4	0.82	<10 *	2	1.6	1.6	1.3	1.5	1.4	1.1
Bicarbonate	mg/L	-	1080	1060	1090	1080	1100	1090	1090	1080	1080	1080	1100	1060	1080	1070	1040	1030	1060	1060	1070	1060	1030	962	1050	986	1060	976	990	1000	960	950	990	1100	960
Carbonate	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<6	<6	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	n/a	n/a	n/a	n/a	<0.05	<0.05	<0.05	0.505	<0.04	<0.04	0.058	0.045	<0.04	<0.02	<0.02	0.1	0.2	<0.1	<0.1	0.2	0.2	0.6	0.1	0.4	0.102	<1.0 *	0.11	0.052	0.28	0.27	0.17	0.14	0.86
TDS*	mg/L	500	3150	3220	3520	3090	3430	3200	3440	3460	3520	3180	3190	3400	3590	3340	3250	3270	3220	3200	3320	3230	3250	3500	3420	3610	3430	3360	3400	3600	3500	3800	3600	3500	3700
Water Nutrients																																		
Ammonia-N	mg/L	-	0.183	0.163	0.23	0.15	0.26	0.27	0.15	< 0.05	0.09	0.1	< 0.05	0.12	< 0.05	< 0.05	0.06	< 0.05	0.08	<0.05	0.12	0.10	0.11	<0.05	0.06	<0.05	<0.050	<0.050	<0.05	0.13	<0.05	0.058	<0.050	<0.050	0.035
TKN	mg/L	-	0.97	0.43	0.32	1.01	0.47	0.35	0.52	0.89	0.46	0.55	0.44	1.91	2.22	1.7	0.85	< 0.2	< 0.2	<0.2	1.5	1.5	0.4	0.4	0.8	0.5	0.57	1.57	0.32	1.3	2.9	3	3.7	0.29	0.74
Hydrocarbons																																		
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																																		
COD	mg/L	-	45	33	48	43	102	12	18	< 5	13	16	< 5	127	119	138	32	< 10	< 10	16	17	14	14	24	11	13	10.6	9.4	58	91	63	96	120	15	81
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6	4.7	6	6.9	5.9	5.6	7.2	6.4	4.3	6
Metals																																		
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0035	<0.0030	0.0041
Antimony	mg/L	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.006	<0.006	<0.05	<0.02	<0.02	<0.001	<0.001	<0.002	0.0007	0.0026	0.0009	<0.0004	0.0006	0.0006	<0.0004	0.0007	n/a	n/a	<0.00040	<0.0006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00032	0.00030	0.00032
Barium	mg/L	1	0.0848	0.0465	0.0337	0.0642	0.0417	0.04	0.0309	0.0249	0.0243	0.024	0.0335	0.023	0.025	0.021	0.024	0.024	0.025	0.021	0.028	0.022	0.016	0.017	0.018	0.021	0.0156	0.0223	0.018	0.015	0.017	0.022	0.014	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.33	0.38	0.35
Cadmium	mg/L	0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0006	<0.0006	<0.005	<0.003	<0.003	<0.00005	<0.00005	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0010	<0.000050	<0.000025	0.000051	0.00018	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0008	<0.0008	<0.0008	0.0012	<0.0008	<0.0008	<0.0008	<0.0009	<0.0009	<0.008	<0.004	<0.004	0.0046	0.0053	<0.005	<0.005	<0.005	<0.005	<0.005	0.011	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.003	<0.0050	0.0033	0.0036	0.0029	0.0035	0.0011
Cobalt	mg/L	-	0.0009	0.0007	0.0011	<0.0007	0.0032	0.0038	0.0029	0.0039	0.0036	0.009	0.007	0.008	<0.0005	0.0006	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0003	<0.0015	<0.00030	<0.0003	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	<0.001	0.003	<0.001	0.002	<0.001	<0.001	0.001	0.001	0.002	<0.01	<0.005	0.006	<0.005	<0.005	<0.01	0.012	0.014	0.011	0.005	0.005	0.003	0.003	0.003	0.004	0.0046	0.0052	0.0014	0.0025	0.0012	0.002	0.0013	0.00053	0.00059
Lead	mg/L	0.01	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	0.005	<0.002	<0.002	<0.02	<0.01	<0.01	<0.0005	<0.0005	<0.001	<0.005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.005	<0.0050	<0.00010	<0.0002	<0.0010	<0.00020	0.00036	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	<0.040	<0.040
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.000005	0.0000032	<0.0000050	<0.0000050	<0.0000050	0.0000026	<0.0000020
Molybdenum	mg/L	-	27.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0002	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.0009	<0.0010	0.00096	0.00094	0.00083	0.00076	0.00078
Nickel	mg/L	-	0.006	0.004	0.002	0.002	0.004	0.003	0.004	0.004	0.003	<0.01	0.006	0.009	<0.003	<0.0025	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	0.004	0.003	0.0029	0.0026	0.0013	<0.0025	0.0013	0.0023	0.0011	0.0016	0.00067
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0031	<0.00020	0.013
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0033	0.0013	0.005
Zinc	mg/L	5	0.0079	0.001	0.0105	0.002	0.0115	0.0065	0.0251	0.0144	0.023	0.016	<0.003	<0.003	0.007	<0.005	<0.01	0.021	0.016	0.011	0.006	0.006	<0.002	0.006	0.004	0.004	0.0054	<0.0020	0.013	<0.015	0.0037	0.0045	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	5.103
Volume Purged (L)	3
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	3.375

Table E21A: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	MW 21A																												
				Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements																																
Field pH	-	6.5-8.5	-	7.7	n/a	8.17	7.86	7.52	7.81	8.06	8	8.06	7.98	8.16	8.07	8.09	7.76	7.04	7.69	7.73	7.56	7.42	7.5	7.72	7.847	8.400	8.17	7.94	8.2	7.79	9.9	8.3	7.88	7.9
Field EC	mS		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.15	4.4	2.40	2.25	4.59	4.44	1.959	2.760	2.4	2.16	1.5	2.38	2.12	2.11	2.14	2.03
Field Temperature	°C		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10.3	4.1 (EF)	9.6	5.7	8.3	6.62	8.5	13.0	9.5	8.7	8.9	10.2	8.3	8.4	7.9	7.5
Routine Water																																
pH	-	6.5-8.5	6.5 - 8.5	8.07	n/a	8.81	8.45	8.29	8.56	8.29	8.28	8.14	7.99	8.27	8.19	8.2	8.3	8.4	8.3	8.4	8.3	8.5	8.6	8.3	8.3	8.38	8.47	8.28	8.59	8.33	8.18	8.19	8.29	8.41
Conductivity (EC)	µS/cm	1000	-	5630	n/a	3050	2240	2320	2310	2220	2090	2090	2180	2150	1970	2050	2110	2160	2030	2110	2070	2100	2450	2110	2030	2070	2060	2100	2100	2000	2000	2000	2000	2000
Calcium	mg/L		-	70.2	n/a	28.1	6.4	14.4	7.7	6.2	4.6	5.3	5.1	4.9	2.6	5	5.8	5.1	5.4	5.7	5.4	5.3	6.9	4.8	6.2	4.24	4.85	4.6	4.1	4.8	4.4	4.4	4.7	4.3
Magnesium	mg/L		-	31	n/a	6.4	1.3	16	5.47	0.72	0.52	0.6	0.82	< 1	< 1	< 1	0.6	0.5	<0.1	0.8	0.6	0.6	0.7	<0.1	1.4	0.36	0.54	0.5	0.47	0.53	0.47	0.44	0.45	0.4
Sodium	mg/L	200	200	1660	n/a	802	595	597	536	602	613	565	629	600	590	582	562	552	536	547	553	534	630	581	527	496	514	440	540	460	470	490	490	480
Potassium	mg/L		-	5.68	n/a	8.88	2.79	16.4	6.2	2.5	1.7	<2	2.4	<2	<2	<2	0.7	1.7	1.5	2.2	2.1	2.2	3.2	1.5	2.4	1.28	1.95	1.5	2	1.6	1.8	1.9	1.7	1.5
Iron	mg/L	0.3	0.3	0.028	n/a	86	n/a	34.2	n/a	n/a	0.02	0.024	n/a	<0.05	0.09	<0.05	1.06	0.021	0.041	0.169	0.096	0.092	0.106	0.015	0.046	<0.0050	0.059	<0.06	<0.060	<0.060	0.22	<0.060	<0.060	<0.060
Sulphate	mg/L	128|218|309|429	500	2960	n/a	1490	352	232	156	126	93.5	93.9	96.9	89.9	76.6	83.2	75.4	70.4	54.5	77.4	79.9	68.5	258	75.9	59.5	62.1	83.1	81	91	82	90	72	71	65
Chloride	mg/L	100	250	21.4	n/a	23.9	18.9	16.8	14.2	15.6	8.9	7.7	8.5	7.7	8.4	6.9	9	10	11	15	10	10	16	11	15	8.35	7.95	9	8.9	8.4	9.3	9.4	8.7	11
Bicarbonate	mg/L		-	1110	n/a	470	1050	1280	1150	1340	1360	1340	1340	1330	1330	1310	1270	1270	1320	1260	1300	1210	1240	1350	1340	1310	1220	1300	1200	1300	1300	1300	1300	1300
Carbonate	mg/L		-	n/a	n/a	65.4	49.7	n/a	61	< 6	< 6	< 6	< 6	< 6	< 6	< 6	14	19	10	25	<5	31	43	<5	13	17.3	31.7	<0.5	38	8.5	<0.50	<0.50	<0.50	11
Nitrate (N)	mg/L	3	10	n/a	n/a	18.1	7.26	11.3	11.5	14.7	13.4	17.7	17	17	17.4	19.7	14.9	16.9	6.3	12.5	14.6	13.9	<0.1	30.1	9.6	6.84	9.3	1.8	1.8	1.8	2.3	1.2	1.3	4.1
TDS*	mg/L	500	500	5300	n/a	2650	1540	1520	1360	1410	1390	1330	1400	1360	1330	1320	1360	1360	1300	1350	1360	1310	1570	1470	1330	1260	1280	1200	1300	1200	1200	1200	1200	1200
Water Nutrients																																
Ammonia-N	mg/L		-	0.25	n/a	2.24	1.49	0.89	0.67	0.71	0.34	0.31	0.42	0.22	0.08	0.35	0.36	0.27	0.17	0.16	0.34	0.37	0.32	0.35	0.34	0.352	0.275	0.13	0.065	0.24	0.068	0.12	0.12	0.071
TKN	mg/L		-	0.7	n/a	20.1	5.62	2.32	2.43	2.31	1.76	2.65	1.96	1.91	1.63	3	2.2	<0.2	1.7	1.9	1.3	2	1.4	1.9	2.7	1.66	2.31	1.5	0.95	2.2	1.4	1.7	0.81	0.96
Hydrocarbons																																
Benzene	mg/L	0.005	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	0.00074	<0.00040
Ethylbenzene	mg/L	0.0016	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L		0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	0.156	<0.48 *	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																																
COD	mg/L		-	34	n/a	1190	450	91	105	132	53	158	73	135	72	134	20	<10	27	24	19	22	42	21	19	24.8	18.7	29	41	110	96	74	28	43
DOC	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8	7.7	8.6	9.5	9.8	10	7	8.4	7.1	9.2
Metals																																
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0058	0.0047	0.0043
Antimony	mg/L	0.006	0.006	<0.005	n/a	n/a	n/a	0.006	n/a	n/a	<0.006	<0.02	n/a	0.0022	0.0014	0.0015	0.0019	0.002	0.0022	0.0011	0.0020	0.0016	0.0007	0.0014	n/a	n/a	0.00082	<0.0006	<0.00060	0.0011	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00093	0.0010	0.0011
Barium	mg/L	1	1	0.0181	n/a	n/a	n/a	0.541	n/a	n/a	0.0533	0.054	n/a	0.105	0.058	0.07	0.081	0.073	0.059	0.086	0.077	0.082	0.037	0.081	0.185	0.0849	0.103	0.084	0.085	0.084	0.073	0.062	0.073	0.096
Boron	mg/L	5	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.83	0.93	0.82
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	<0.0005	n/a	n/a	n/a	0.002	n/a	n/a	<0.0006	<0.003	n/a	<0.00001	<0.00005	0.00012	<0.001	<0.001	<0.0001	<0.0001	<0.0001	0.0002	0.0002	0.0002	<0.001	<0.0010	0.00009	0.00024	0.000062	0.0001	0.000034	0.000067	0.000079	0.000099
Chromium	mg/L		0.05	0.002	n/a	n/a	n/a	0.0287	n/a	n/a	<0.0009	<0.004	n/a	0.0006	0.0031	0.0027	< 005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.001	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	-	<0.0007	n/a	n/a	n/a	0.0128	n/a	n/a	0.0031	0.0045	n/a	0.0013	<0.0005	0.0003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.007	1	<0.001	n/a	n/a	n/a	0.059	n/a	n/a	0.004	0.006	n/a	0.011	0.023	0.003	0.004	0.005	0.004	0.003	0.003	0.002	0.001	0.002	0.001	0.0017	0.0022	0.002	0.0009	0.003	0.0015	0.0012	0.0025	0.0016
Lead	mg/L	8|0.004|0.0042|0.0	0.01	<0.002	n/a	n/a	n/a	0.019	n/a	n/a	<0.002	<0.01	n/a	0.0026	<0.0005	0.0001	< 0.005	<0.005	0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.005	<0.0050	<0.00010	<0.0002	<0.00020	<0.00020	0.00024	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	<0.0040
Mercury	mg/L	0.00005	0.001	<0.0001	n/a	<0.0001	n/a	< 0.0001	n/a	n/a	<0.0001	<0.0001	n/a	n/a	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.000010	0.0000058	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L		-	<0.001	n/a	n/a	n/a	0.035	n/a	n/a	0.018	0.02	n/a	0.023	0.017	0.018	0.016	0.014	0.012	0.010	0.010	0.010	0.008	0.009	0.019	0.0085	0.0075	0.0076	0.0071	0.0069	0.0065	0.0058	0.0062	0.0058
Nickel	mg/L	054|0.057|0.059|0.0	-	0.002	n/a	n/a	n/a	0.038	n/a	n/a	0.002	0.005	n/a	0.0092	<0.0025	0.0026	0.003	0.003	0.003	0.002	0.002	0.003	0.009	0.003	<0.002	0.0031	0.0023	0.0031	0.0025	0.0027	0.0027	0.0029	0.0031	0.0028
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00022	<0.00020	0.0002
Uranium	mg/L	0.01	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0034	0.0033	0.0036
Zinc	mg/L	0.03	5	0.0144	n/a	n/a	n/a	0.146	n/a	n/a	0.0299	0.023	n/a	0.061	0.012	0.007	0.015	0.007	0.009	0.004	0.01	0.003	0.004	0.008	0.004	0.0061	0.0047	0.014	<0.0030	0.005	<0.0030	<0.0030	<0.0030	<0.0030

Notes:
[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)
Information not available (n/a)
Total Dissolved Solids, not a measured value (TDS)
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.675
Volume Purged (L)	18 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	4.979

Table E21B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 21B																											
			Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements																														
Field pH	-	-	7.37	7.47	7.44	7.37	8	7.75	8	8.15	8.24	8.22	8.1	8.21	7.75	7.73	7.54	7.55	7.64	7.59	8.66	7.851	7.803	8.08	7.83	7.68	5.6	8.0	8.3	7.89	7.8
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.79	5.99 (EF)	2.68	2.77	6.27	6.12	2.420	2.640	15.3	2.78	1.18	2.99	2.87	2.82	2.84	2.78
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10.8	8.9	6.5	9.3	4.6	10.87	5.2	6.2	15.7	12.3	6.9	n/a	6.6	6.9	6.5	6.5
Routine Water																															
pH	-	6.5 - 8.5	7.93	7.82	7.97	8.04	8.01	7.94	8.12	8.02	8.25	8.27	8.45	8.4	8.4	8.3	8.3	8.3	8.4	8.5	8.3	8.4	8.35	8.38	8.27	8.33	8.43	8.21	8.16	8.25	8.39
Conductivity (EC)	µS/cm	-	2490	2370	2510	2650	2380	2370	2440	2460	2500	2450	2470	2560	2660	2510	2490	2670	2770	2610	2560	2530	2660	2700	2700	2700	2700	2700	2700	2600	2600
Calcium	mg/L	-	6.2	17.6	18.8	17.1	13.8	15	14.3	14.9	15.1	13.4	13.7	17.3	7.6	17.1	15	19	18.9	2.5	16.5	17.2	19.5	17.6	17	17	16	17	16	16	17
Magnesium	mg/L	-	5.2	5.3	5.8	5.04	4.58	5.13	4.67	3.96	4.1	3.2	3.6	5.1	5.2	4.2	5.0	5.8	6.2	1.0	4.3	5.6	6.3	5.41	5.4	5.6	5.4	5.6	4.9	5.0	5.3
Sodium	mg/L	200	643	587	665	710	557	587	573	692	720	603	632	624	627	625	638	648	670	131	641	603	679	600	650	700	620	610	630	630	640
Potassium	mg/L	-	6	4.46	1.17	4	4.4	< 4	3.6	3.7	3.5	2.3	3.2	3.9	4.4	3.8	3.2	4.4	4.7	0.8	5.7	3.2	4.4	4.12	4.2	4.3	3.9	4	4.2	3.9	4.1
Iron	mg/L	0.3	1.87	1.38	0.035	0.046	<0.003	0.056	<0.02	0.073	<0.05	<0.05	<0.05	0.408	<0.005	0.006	0.104	0.005	0.019	0.017	0.013	0.028	0.113	<0.010	<0.06	<0.060	<0.060	0.071	<0.060	<0.060	<0.060
Sulphate	mg/L	500	563	561	644	618	600	545	549	606	630	592	604	566	590	550	524	619	613	123	564	532	588	579	600	590	590	650	570	530	570
Chloride	mg/L	250	0.9	0.9	<0.5	0.7	2.4	<0.5	0.6	0.5	<0.5	<0.5	<0.5	1	2	2	2	3	2	2	2	3	0.74	0.66	2	1.1	1.7	1.5	1.6	1.1	1.1
Bicarbonate	mg/L	-	995	1010	1020	1030	1020	1030	1030	1080	1070	1090	1000	994	1010	1010	1000	1030	1000	980	1030	1040	1040	996	1000	1000	1000	1000	1000	1000	1000
Carbonate	mg/L	-	n/a	n/a	n/a	<6	<6	<6	<6	<6	<6	<6	33	17	13	<5	8	8	21	0.1	<5	14	11.9	24.5	<0.5	8.3	19	<0.50	<0.50	<0.50	9.2
Nitrate (N)	mg/L	10	0.17	<0.05	0.12	0.17	0.14	<0.04	0.11	0.073	<0.02	0.284	<0.02	0.2	0.4	<0.1	<0.1	0.2	0.2	0.1	<0.1	<0.1	<0.050	<0.050	0.052	0.022	0.045	<0.010	0.11	0.11	0.19
TDS*	mg/L	500	1710	1670	1830	1860	1810	1660	1650	1850	1900	1750	1780	1720	1750	1700	1690	1810	1830	773	1740	1690	1820	1720	1800	1800	1800	1800	1800	1700	1800
Water Nutrients																															
Ammonia-N	mg/L	-	0.23	0.17	0.2	0.14	0.35	0.09	<0.05	0.28	<0.05	0.14	0.22	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.05	<0.050	<0.05	<0.050	<0.050	<0.050	0.016
TKN	mg/L	-	0.56	0.46	0.54	0.67	0.48	0.35	0.19	0.86	0.5	0.86	0.87	0.4	<0.2	0.3	0.4	0.3	<0.2	0.3	0.3	0.6	0.43	0.54	0.45	0.4	0.36	0.34	0.28	<0.05	0.31
Hydrocarbons																															
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																															
COD	mg/L	-	45	21	17	9	22	19	8	68	6	29	22	< 10	< 10	17	16	15	14	17	9	12	45.7	11.8	32	34	23	31	20	20	20
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	4.4	5.2	4.6	5.5	4.7	3.8	4.2	4.4	6.1
Metals																															
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0042	<0.0030	0.0035
Antimony	mg/L	0.006	<0.005	<0.005	<0.005	<0.006	<0.006	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	0.0007	0.001	0.0008	<0.0004	0.0008	0.0006	0.0005	0.0006	n/a	n/a	<0.00040	<0.006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00053	0.00064	0.00064
Barium	mg/L	1	0.053	0.0369	0.0149	0.0118	0.0104	0.011	0.0125	0.013	0.011	0.012	0.015	0.011	0.011	0.011	0.011	0.017	0.01	0.01	0.009	0.018	0.009	0.0102	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.22	0.25	0.23
Cadmium	mg/L	0.005	<0.0005	<0.0005	<0.0005	<0.0006	<0.0006	<0.005	<.003	<0.003	<0.00005	<0.00005	<0.00005	<0.0001	<0.001	<0.0001	<0.0001	0.0001	0.0007	0.0002	0.0001	<0.001	<0.0010	0.000225	<0.00005	0.000057	0.000038	0.000042	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	0.0049	0.002	<0.0008	<0.0009	<0.0009	<0.008	< .004	<0.004	0.0043	0.0051	0.0026	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.0050	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0029	0.0029	0.0021	0.0023	0.0024	<0.007	0.0035	0.0085	<0.0005	< 0.0005	0.0006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0015	<0.00030	<0.0003	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	0.002	0.003	0.002	0.003	0.004	<0.01	<0.005	0.007	<0.005	<0.005	0.007	0.006	0.007	0.007	0.004	0.004	0.003	0.002	0.002	0.001	0.003	0.0028	<0.002	0.0011	0.0014	0.0014	0.0008	0.00066	0.00033
Lead	mg/L	0.01	0.002	< 0.002	0.003	<0.002	<0.002	<0.02	0.012	<0.01	<0.0005	<0.0005	<0.0005	0.0001	<0.005	0.0002	<0.0001	0.0007	0.0001	0.0001	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0010	<0.00020	<0.0002	<0.00020	<0.00020	0.00034
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.004	<0.0040	0.0041
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.001	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.0050	<0.0050	<0.002	0.0011	0.002	0.0063	0.0051	0.0027	0.0018
Nickel	mg/L	-	0.007	0.002	0.002	0.002	0.002	<0.01	<0.005	<0.005	<0.003	<0.0025	0.0028	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.005	<0.0025	0.001	0.0015	0.0013	0.0013	0.00086
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0016	0.0017	0.0017
Zinc	mg/L	5	0.0131	0.0075	0.0084	0.0087	0.0186	0.014	<0.003	<0.003	<0.005	<0.005	0.009	0.007	0.01	0.043	0.006	0.008	0.004	0.008	0.005	0.005	0.007	<0.0020	<0.03	0.016	0.0051	0.003	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	6.096
Volume Purged (L)	18 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.990

Table E22A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 22A																										
			Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	May-10	Jun-11	May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements																													
Field pH	-	-	8.06	8.12	7.74	7.62	7.54	7.7	7.54	7.15	7.9	7.81	7.81	7.75	7.63	7.46	7.97	7.32	7.73	7.45	7.73	7.639	7.900	8.12	7.71	7.9	7.45	9.9	n/a	7.76	7.6
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5.47	12.89 (EF)	5.70	5.51	12.66	12.26	5.130	3.450	3	5.27	1.34	4.78	5.64	n/a	5.60	5290
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12.2	4.2	10.4	6.1	7.5	8.0	8.8	10.0	11.4	11	9.6	10.9	7.4	n/a	10.0	9
Routine Water																															
pH	-	6.5 - 8.5	8.78	8.27	8.23	8.4	7.94	8.02	7.94	7.84	8.02	8.01	8.11	8.3	8.3	8.1	8.2	8.0	8.5	8.3	8.2	8.2	8.2	8.26	8.19	8.33	8.18	7.83	8.08	8.09	8.33
Conductivity (EC)	µS/cm	-	6260	5240	5510	5390	5440	5310	5290	5090	5480	5120	5280	5500	5530	7630	5540	7470	5600	5640	5660	5320	5350	5360	5400	5500	5300	5300	5300	5300	5200
Calcium	mg/L	-	46.6	33.8	42.2	36.5	39.8	39.4	39.4	40	41.4	34.7	46.2	44.7	18.5	116	41.5	117	48.9	42.5	43.8	41.1	36.4	37	33	35	36	36	36	35	36
Magnesium	mg/L	-	10.6	5.4	6.2	4.18	4.43	4.3	4.31	4.62	4.3	3.4	4.3	4.5	4.6	55.5	5.3	56.5	6.7	4.3	4.0	4.6	3.73	3.98	3.5	3.8	3.6	3.7	3.6	3.4	3.6
Sodium	mg/L	200	1580	1450	1660	1460	1510	1450	1310	1460	1510	1190	1440	1320	1340	2020	1390	2000	1460	1390	1490	1330	1200	1220	1200	1300	1300	1300	1200	1200	1300
Potassium	mg/L	-	10.6	5.75	6.07	4.5	4.1	4.7	4.7	4.3	4.8	3.7	4.9	4	4.9	8.9	4.8	9.0	5.3	5.6	3.6	2.5	3.22	4.33	3.8	4.9	3.9	4.1	4.7	4.1	4.6
Iron	mg/L	0.3	62.6	n/a	0.004	n/a	0.022	n/a	<0.02	2.42	<0.05	<0.05	<0.1	0.661	<0.005	0.013	<0.005	<0.005	0.212	0.061	<0.005	0.074	<0.0050	0.013	<0.06	0.083	<0.060	0.065	<0.060	<0.60	<0.60
Sulphate	mg/L	500	2950	2380	2750	2380	2450	2260	2190	2370	2560	2000	2360	2180	2170	3520	2340	3770	2250	2030	2180	2020	2040	2040 *	1900	2500	2200	2200	2000	2000	1900
Chloride	mg/L	250	16.2	16.4	10.3	15.7	11.2	8.1	6.4	10.2	9.3	10.4	9.8	11	10	2	12	3	12	13	11	11	10.6	<10 *	12	11	11	11	12	11	13
Bicarbonate	mg/L	-	492	841	908	832	939	937	935	927	957	974	959	948	963	1210	932	1210	867	956	957	973	986	951	950	940	950	940	960	960	950
Carbonate	mg/L	-	74.1	n/a	n/a	24	<6	<6	<6	<6	<6	<6	<6	7	<5	<5	<5	<5	20	<5	<5	<5	<5.0	<5.0	<0.5	4.8	<0.50	<0.50	<0.50	<0.50	2.4
Nitrate (N)	mg/L	10	1.83	3.41	4.43	6.83	7.56	9.36	11.8	10.9	12.2	12.2	13.3	12.8	11.2	<0.1	12.5	0.1	11.8	13.3	27.5	16.2	11.1	6.4 *	7	16	15	16	16	17	70
TDS*	mg/L	500	4930	4300	4920	4330	4870	4220	4010	4350	4590	3720	4330	4090	4070	6320	4310	6550	4280	4020	4320	3960	3830	3800	3700	4400	4100	4100	3800	3800	3800
Water Nutrients																															
Ammonia-N	mg/L	-	1.95	2.1	<0.05	1.5	1.32	0.23	0.39	0.42	0.4	0.36	0.17	0.32	0.39	<0.05	0.25	<0.05	0.12	0.15	<0.05	0.31	0.196	0.224	0.1	0.34	0.18	<0.050	0.11	<0.050	0.15
TKN	mg/L	-	4.11	2.37	3.14	2.63	1.49	0.93	1.25	1.52	1.31	1.42	2.5	1.5	0.4	0.4	1.5	<0.2	1.2	1.1	1.3	2.1	1.46	1.13	0.83	0.74	0.83	1.2	0.99	0.070	1
Hydrocarbons																															
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.75	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																															
COD	mg/L	-	421	78	154	102	46	16	27	52	31	51	59	<10	<10	19	21	10	70	15	14	21	17.3	11.8	100	56	49	92	49	21	36
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6	5.6	6.2	8.3	6.2	7.4	5.1	7.0	5.4	6.7
Metals																															
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0047	0.0058
Antimony	mg/L	0.006	n/a	n/a	0.006	n/a	<0.006	n/a	n/a	<0.005	0.001	< 0.001	0.0008	0.0012	0.0014	0.0014	0.0004	0.0007	0.0010	0.0010	0.0008	n/a	n/a	0.00046	<0.006	<0.0060	0.00091	<0.00060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00033	0.0003
Barium	mg/L	1	n/a	n/a	0.0173	n/a	0.0136	n/a	n/a	0.0182	0.015	0.015	0.016	0.018	0.011	0.013	0.02	0.011	0.020	0.015	0.011	0.014	0.0109	0.0105	0.011	0.011	0.01	0.014	<0.010	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.82	0.85	0.9
Cadmium	mg/L	0.005	n/a	n/a	<0.0005	n/a	<0.0006	n/a	n/a	0.0005	<0.00001	<0.00005	0.00021	0.0003	<0.001	0.0003	<0.0001	0.0001	0.0003	<0.0001	0.0003	<0.001	<0.0010	0.000405	0.00012	0.00022	0.00012	0.000059	<0.00020	0.000026	0.000058
Chromium	mg/L	0.05	n/a	n/a	<0.0008	n/a	<0.0009	n/a	n/a	<0.0008	<0.0005	<0.003	0.0013	<0.005	0.015	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	n/a	n/a	0.0029	n/a	0.0039	n/a	n/a	0.0033	0.0005	0.001	0.0008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.00030	<0.00030	<0.0030	<0.00030	<0.00030
Copper	mg/L	1	n/a	n/a	0.006	n/a	0.003	n/a	n/a	0.012	0.005	<0.005	0.006	0.015	0.019	0.012	0.008	0.007	0.007	0.004	0.003	0.007	0.0047	0.0057	<0.002	<0.0020	0.0024	0.00084	<0.0020	0.0024	0.002
Lead	mg/L	0.01	n/a	n/a	<0.002	n/a	<0.002	n/a	n/a	0.003	0.0003	<0.0005	<0.0001	<0.0001	<0.005	0.00021	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.00020	<0.00020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.018	<0.040	<0.040
Mercury	mg/L	0.001	<0.0001	n/a	<0.0001	n/a	<0.0001	n/a	n/a	n/a	n/a	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	n/a	n/a	0.023	n/a	0.015	n/a	n/a	0.011	0.013	0.01	0.01	0.008	0.008	0.007	0.006	<0.005	0.006	0.009	0.008	0.007	0.0065	0.0072	0.01	0.006	0.0062	0.0054	0.0056	0.0057	0.006
Nickel	mg/L	-	n/a	n/a	0.011	n/a	0.007	n/a	n/a	0.007	0.0039	<0.003	0.0032	0.004	0.004	0.004	0.004	<0.002	0.004	<0.002	0.004	0.004	0.0042	0.0037	<0.005	<0.0050	0.0028	0.0024	<0.0050	0.0051	0.0023
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.004	0.0042	0.0041
Zinc	mg/L	5	n/a	n/a	0.0201	n/a	0.0298	n/a	n/a	0.0271	0.066	0.011	0.013	0.015	0.024	0.022	0.009	0.014	0.004	0.015	0.012	0.015	0.0064	0.0743	<0.03	<0.030	0.0052	<0.0030	<0.030	0.0033	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.635
Volume Purged (L)	17 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	5.033

Table E22B: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	MW 22B																											
				Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Jan-07	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements																															
Field pH	-	6.5-8.5	-	6.97	7.45	7.13	7.12	7.43	7.77	7.43	7.8	7.51	7.51	7.65	7.71	7.46	7.18	6.96	7.2	7.4	n/a	7.44	7.56	7.569	7.300	7.84	7.71	7.35	5.5	7.7	7.8	7.57	7.5
Field EC	mS		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7.96	18.78 (EF)	8.07	7.26	n/a	17.20	19.83	7.270	>3.999	3.1	8.11	3.5	8.25	8.56	8.25	8.78	7870
Field Temperature	°C		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.6	8.5	6.9	7.2	n/a	4.8	10.08	14.9	11.5	11.6	9.6	6.8	10.3	6.4	8.4	9.7	7.8
Routine Water																															
pH	-	6.5-8.5	6.5 - 8.5	7.97	7.5	7.64	7.7	7.66	7.61	7.76	7.69	7.72	7.81	8.06	8.2	8.1	8.2	8.1	8.1	8.2	8.0	8.2	8.1	8.1	8.18	8.14	8.03	8.18	8.24	8.07	7.86	7.97	8.23
Conductivity (EC)	µS/cm	1000	-	8110	7850	8400	8610	7590	7750	7870	7900	7940	7890	7420	7890	8010	5420	7460	8020	9950	8280	8040	8240	7930	8320	8200	8100	8100	8200	8100	8200	8200	8000
Calcium	mg/L		-	42.5	119	140	127	98.4	119	106	125	123	128	105	118	70.8	44.9	71.9	126	187	135	109	117	113	112	109	110	120	100	110	120	110	110
Magnesium	mg/L		-	53	57.5	61.8	58.9	53.1	57.7	55.5	58.2	59.2	58.7	46.6	54.7	57.2	3.6	57.8	61.4	73.2	60.9	55.1	61.4	58	53.9	53.1	52	52	49	51	55	55	54
Sodium	mg/L	200	200	2180	1900	2250	2160	2150	1900	2020	2340	2450	1960	1910	2000	2010	1420	2120	2030	2530	2230	2000	2100	2000	1910	1860	2000	2100	2000	2100	1900	2000	2000
Potassium	mg/L		-	13.5	9.97	17.1	10.1	12.8	8.2	11	11	11	7.4	9	7.3	10.7	4.6	10.2	9.5	13.9	12.0	10.7	9.2	5.8	9.61	8.79	9.9	9.8	9	8.5	10	10	9.8
Iron	mg/L	0.3	0.3	1.37	1.13	0.025	0.026	0.014	0.1	<0.02	0.018	<0.1	<0.1	<0.1	0.243	<0.005	0.005	<0.005	<0.005	0.005		0.012	<0.005	<0.005	<0.0050	0.015	<0.06	<0.060	<0.060	0.075	<0.60	<0.60	<0.60
Sulphate	mg/L	128|218|309|429	500	4140	4020	4540	4070	4480	4000	3880	4570	4890	4120	3800	3750	3800	2170	3590	3890	4970	3820	3440	3840	3470	3730	3590 *	3900	3800	3800	3900	3900	3900	3300
Chloride	mg/L	100	250	1	1	<0.5	0.8	4.5	0.5	0.6	0.9	<0.5	3	<0.5	1	2	11	3	3	3	3	2	2	3	1.21	<10 *	3	1.5	1.8	1.3	1.8	1.4	1.9
Bicarbonate	mg/L		-	1210	1230	1230	1230	1240	1230	1260	1190	1250	1220	1210	1180	1220	962	1230	1200	992	1180	1230	1240	1260	1240	1210	1200	1200	1200	1200	1200	1300	1200
Carbonate	mg/L		-	n/a	n/a	n/a	<6	<6	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	3	10	0.28	< 0.05	0.17	0.12	0.14	< 0.04	0.083	0.218	0.063	< 0.04	< 0.04	0.5	0.2	7.6	0.1	0.2	0.3	0.3	0.2	0.1	0.3	0.09	<1.0 *	0.14	0.18	0.11	0.11	0.16	<0.010	0.38
TDS*	mg/L	500	500	7030	6710	7620	7030	7430	6690	6700	7680	8150	6870	6470	6510	6550	4160	6460	6710	8270	6840	6220	6740	6270	6430	6220	6600	6700	6600	6800	6600	6600	6000
Water Nutrients																															
Ammonia-N	mg/L		-	0.47	0.29	0.3	0.41	0.11	0.12	<0.05	0.34	<0.05	<0.05	0.23	<0.05	<0.05	0.1	<0.05	<0.05	0.27	n/a	<0.05	<0.05	<0.05	<0.050	<0.050	<0.05	<0.050	<0.05	<0.050	<0.050	<0.050	0.04
TKN	mg/L		-	1	0.8	0.7	0.91	0.76	0.57	0.28	1.84	0.38	0.49	2.08	0.6	< 0.2	0.5	0.5	<0.2	0.6	n/a	0.5	0.3	0.4	0.58	0.88	0.51	0.36	0.46	0.36	0.52	0.27	0.32
Hydrocarbons																															
Benzene	mg/L	0.005	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L		0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	0.118	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																															
COD	mg/L		-	69	30	22	<5	28	24	12	98	12	14	74	10	< 10	18	20	14	20	n/a	15	17	22	20.8	12.9	41	19	37	15	51	18	20
DOC	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6	6.1	6.2	8	5.9	6	5.3	5.7	4.7	6.6
Metals																															
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	<0.0030	0.0037
Antimony	mg/L	0.006	0.006	<0.005	<0.005	<0.005	<0.006	<0.006	<0.05	<0.02	<0.02	<0.002	<0.002	<0.002	0.0007	0.0009	0.001	<0.0004	0.0008	0.006	n/a	<0.0004	0.0009	n/a	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00035	0.00027
Barium	mg/L	1	1	0.0591	0.0293	0.0123	0.0074	0.0101	0.007	0.0125	0.0115	0.011	<0.01	0.014	0.009	0.012	0.01	0.012	0.01	0.013	n/a	0.01	0.008	0.008	0.0067	0.0101	<0.01	<0.010	<0.010	<0.010	<0.10	<0.10	<0.10
Boron	mg/L	1	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.25	0.25	0.25
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	<0.0005	<0.0005	<0.0005	<0.0006	<0.0006	<0.005	<0.003	<0.003	<0.0001	<0.0001	<0.0001	0.0003	<0.001	0.0001	0.0004	0.0002	0.0002	n/a	<0.0001	0.0020	<0.001	<0.0010	0.00021	0.00013	0.000096	0.000082	0.00018	<0.00020	<0.0000020	<0.000020
Chromium	mg/L		0.05	0.0022	0.0016	<0.0008	<0.0009	<0.0009	<0.008	<0.004	<0.004	<0.005	0.0062	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	n/a	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	0.0015	<0.0010
Cobalt	mg/L		-	0.0046	0.0044	0.0037	0.0048	0.0044	0.016	0.012	0.018	<0.001	<0.001	0.0022	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	n/a	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	<0.00030
Copper	mg/L	0.007	1	0.007	0.005	0.003	0.002	0.003	<0.01	<0.005	0.008	<0.01	<0.01	<0.01	0.019	0.029	0.016	0.009	0.009	0.009	n/a	0.006	0.005	0.009	0.0076	0.0093	<0.002	0.0046	<0.0020	<0.0020	<0.0020	0.0012	0.00037
Lead	mg/L	8|0.004|0.0042|0.0	0.01	<0.002	<0.002	0.005	0.003	<0.002	<0.02	0.017	<0.01	<0.001	<0.001	<0.001	<0.0001	<0.005	<0.0001	<0.0001	0.0002	<0.0001	n/a	<0.0001	0.0002	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.040	<0.040	<0.040
Mercury	mg/L	0.00005	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	n/a	<0.0001	0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L		-	0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	n/a	<0.005	,005	<0.005	<0.0050	<0.0050	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00081	0.00082
Nickel	mg/L	054|0.057|0.059|0.(	-	0.017	0.005	0.007	0.005	0.004	<0.01	0.014	0.029	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.0069	n/a	<0.002	0.005	0.004	0.0047	0.0044	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0020	0.0013
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00036	0.00028
Vanadium	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.010	<0.0010	<0.0010
Zinc	mg/L	0.03	5	0.0261	0.0165	0.0191	0.0136	0.0169	0.015	0.0045	0.013	0.016	< 0.01	0.018	0.022	0.031	0.025	0.011	0.013	0.003	n/a	0.005	0.020	0.024	0.006	0.0026	<0.03	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	6.098
Volume Purged (L)	16 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	3.230

Table E23A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 23A																												
			Oct-97	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements																															
Field pH	-	-	n/a	7.11	8.54	7.69	8.26	9.07	8.78	9.07	8.46	8.81	8.75	8.73	7.76	8.49	8.04	8.19	8.05	8.36	8.15	7.89	8.529	7.5	8.3	8.63	7.85	6.08	8.5	8.8	8.65	8.8
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.9	6.04 (EF)	2.56	2.73	5.78	5.73	2.190	2.632	1.935	2.52	3.5	2.81	2.25	2.24	2.24	2130
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12.4	4.3	8.1	5.3	7.4	9.2	9.0	11.2	10.2	11.3	12	9.1	7.9	8.9	8.6	8.5
Routine Water																															
pH	-	6.5 - 8.5	8.22	8.35	8.54	8.67	8.72	8.73	8.61	8.7	8.48	8.72	8.57	8.63	8.5	8.5	8.5	8.5	8.5	8.6	8.5	8.5	8.5	8.57	8.57	8.63	8.57	8.63	8.48	8.44	8.53	8.75
Conductivity (EC)	µS/cm	-	3740	9620	5490	3820	3260	3160	2990	2750	2740	2640	2420	2590	2340	2610	2440	2430	2450	2440	2090	2450	2290	2320	2220	2400	2300	2200	2200	2100	2100	2100
Calcium	mg/L	-	32.2	109	22.2	20.6	13.7	7.7	8.9	6.7	8	6.4	3.7	7.6	6.5	7.4	7.2	7.1	9	7.6	4.8	6.5	6.6	5.7	5.5	6	4.7	4.8	5.4	4.1	4.1	4.4
Magnesium	mg/L	-	9.2	30.1	5.5	14.8	7.32	1.81	1.88	1.4	1.16	<1	<1	1.1	1	1.2	<0.1	1.5	1.1	1.3	0.2	0.2	1.1	0.8	0.74	0.8	0.62	0.6	0.63	0.48	0.49	0.47
Sodium	mg/L	200	1260	2620	1400	978	897	830	840	685	762	706	678	730	631	672	628	631	633	633	536	656	601	578	519	600	580	550	570	500	560	570
Potassium	mg/L	-	6.71	13.8	6.24	14.6	8.7	3.2	3.2	2.5	2.3	<2	<2	2.3	1.8	1.4	1.7	2.3	2.4	2.5	2.3	1.9	1.4	2	2.01	2.2	2.2	1.9	1.8	2.2	2.0	2
Iron	mg/L	0.3	0.017	102	n/a	< 0.003	n/a	n/a	n/a	0.021	< 0.003	<0.05	0.09	<0.05	0.254	0.011	0.046	0.009	0.073	0.260	0.098	0.029	0.032	0.0698	0.02	<0.06	<0.060	<0.060	0.38	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1780	5540	2390	1510	1110	768	836	635	679	509	380	537	281	413	318	301	329	280	60.6	284	232	193	155	190	190	160	110	90	85	77
Chloride	mg/L	250	1.9	5.6	16.8	18.5	18.6	18.5	< 0.5	14.1	14.4	13.4	15.7	15.8	17	18	18	19	20	19	9	18	18	16.7	16.1	18	19	19	17	20	18	21
Bicarbonate	mg/L	-	1230	509	648	821	659	842	956	1020	1010	1020	1120	1080	1190	1170	1200	1220	1210	1190	1290	1260	1290	1250	1200	1200	1300	1200	1300	1300	1300	1300
Carbonate	mg/L	-	n/a	8.12	54.3	67.7	60	91	56	50	56	87	58	65	32	32	33	34	28	43	36	31	29	41.2	45.3	44	35	55	28	17	26	54
Nitrate (N)	mg/L	10	n/a	<0.05	<0.05	0.09	0.055	<0.02	<0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	9.7	<0.1	0.7	<0.050	<0.050	0.016	0.005	<0.003	<0.010	<0.010	<0.010	<0.044
TDS*	mg/L	500	3700	8570	4210	3030	n/a	2140	2220	1900	2020	1830	1690	1890	1560	1720	1600	1590	1620	1570	1330	1610	1520	1450	1330	1500	1500	1400	1400	1300	1300	1300
Water Nutrients																															
Ammonia-N	mg/L	-	0.63	2.75	2.04	0.84	3.21	1.66	0.81	1.03	0.85	0.76	0.69	0.98	0.79	0.7	0.42	0.68	1.03	0.94	0.44	0.78	0.85	0.785	0.426	1.1	0.86	0.79	0.6	0.76	0.76	0.93
TKN	mg/L	-	0.94	26.7	2.52	11.9	5.42	2.08	1.7	1.49	2.31	1.7	1.82	4.94	1.1	1.3	1.9	1.7	3.6	2.7	2.9	1.5	1.5	1.71	2.01	3.2	1.7	2	1.5	1.4	1.5	1.6
Hydrocarbons																															
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	0.12	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	0.095	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																															
COD	mg/L	-	18	1650	95	937	65	85	62	50	99	67	72	187	40	10	48	51	42	44	21	39	49	46.5	44.9	190	78	78	81	55	55	57
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	14	15.2	16.8	16	19	18	16	16	16	21
Metals																															
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0043	0.0049	0.01	
Antimony	mg/L	0.006	<0.005	n/a	n/a	0.008	n/a	n/a	n/a	n/a	<0.005	0.0015	0.007	0.0028	0.0007	0.0009	0.0015	<0.0004	0.0018	0.0017	0.0016	0.0008	n/a	n/a	<0.00040	<0.006	<0.00060	0.0012	0.00082	<0.00060	<0.00060	0.0013
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0065	0.0058	0.009
Barium	mg/L	1	0.0463	n/a	n/a	0.0149	n/a	n/a	n/a	n/a	0.0227	0.057	0.017	0.032	0.027	0.022	0.023	0.029	0.033	0.036	0.097	0.032	0.032	0.0331	0.0356	0.04	0.037	0.043	0.040	0.038	0.050	0.063
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.77	0.88	0.85
Cadmium	mg/L	0.005	<0.0005	n/a	n/a	<0.0005	n/a	n/a	n/a	n/a	<0.0005	0.00002	<0.0001	0.00009	<0.001	<0.001	<0.0001	<0.0001	0.0002	0.0003	0.0002	0.0001	<0.001	<0.0010	0.000085	0.00006	0.00011	0.000066	0.000075	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0008	n/a	n/a	<0.0008	n/a	n/a	n/a	n/a	<0.0008	0.0024	<0.005	0.0029	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0015	n/a	n/a	0.0019	n/a	n/a	n/a	n/a	0.0023	0.0052	<0.001	0.0011	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	0.00036	0.0003	0.0007	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	<0.001	n/a	n/a	0.002	n/a	n/a	n/a	n/a	0.004	0.036	<0.01	0.004	0.004	0.004	0.004	0.003	0.005	0.004	0.002	0.001	0.004	0.0016	0.0014	<0.002	0.00059	0.00026	0.0028	0.00042	0.00049	<0.00020
Lead	mg/L	0.01	0.002	n/a	n/a	0.002	n/a	n/a	n/a	n/a	<0.002	0.0083	<0.001	0.0003	<0.005	<0.005	0.0002	<0.0001	0.0003	0.0007	<0.0001	0.0003	<0.005	<0.0050	0.00016	<0.002	<0.00020	<0.00020	0.00088	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0071	0.0079	0.0064
Mercury	mg/L	0.001	<0.0001	<0.0001	n/a	<0.0001	n/a	n/a	n/a	n/a	n/a	n/a	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.003	n/a	n/a	0.035	n/a	n/a	n/a	n/a	0.031	0.025	0.019	0.02	0.01	0.012	0.01	0.011	0.011	0.009	0.01	0.009	0.006	0.0065	0.0059	0.006	0.0058	0.0055	0.0050	0.0042	0.0046	0.0045
Nickel	mg/L	-	0.019	n/a	n/a	0.011	n/a	n/a	n/a	n/a	0.011	0.0276	0.015	0.0261	0.014	0.005	0.018	0.013	0.017	0.019	0.002	0.009	0.01	0.0079	0.0054	0.011	0.0069	0.0069	0.0097	0.0032	0.0031	0.0095
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0032	0.0027	0.0049
Zinc	mg/L	5	0.0096	n/a	n/a	0.0067	n/a	n/a	n/a	n/a	0.0107	0.053	<0.01	0.007	0.029	0.009	0.009	0.004	0.005	0.005	0.005	0.036	0.016	0.0093	0.0033	<0.03	0.0071	<0.0030	0.0031	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.663
Volume Purged (L)	26 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	0.982

Table E23B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 23B																									
			Oct-98	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	May-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements																												
Field pH	-	-	6.98	n/a	7.18	7.71	7.33	7.71	7.5	7.51	7.52	7.58	7.51	7.36	7.2	6.87	7.11	7.27	7.14	7.19	7.437	8.3	n/a	7.43	7.17	5.77	7.5	7.8	7.45	7.3
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.44	24.7 (EF)	11.1	7.19	23.8	21.1	8.730	1.816	n/a	9.39	4.38	10.67	9.8	9.75	10.17	9700
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.8	8.2	5.9	6.6	6.0	7.2	9.0	13.2	n/a	12.9	8.8	9.5	9.9	9.8	10.3	9.3
Routine Water																														
pH	-	6.5 - 8.5	7.69	7.68	7.67	7.67	7.54	7.67	7.59	7.8	7.75	7.95	8.1	8.1	8	8	8	8.3	8.2	8.0	8	8.19	8.16	7.94	8.07	8.24	8.06	7.76	7.89	8.05
Conductivity (EC)	µS/cm	-	8760	9560	10000	8950	9280	9590	9140	9480	9220	8970	9870	9580	9660	8940	10200	8250	10100	9790	9490	9710	9530	9400	9400	9700	9600	9700	9900	10000
Calcium	mg/L	-	113	181	162	147	192	172	191	193	191	168	201	169	209	158	163	121	184	171	173	160	178 *	160	160	150	170	170	170	170
Magnesium	mg/L	-	49.4	51.7	48.2	39.9	51.8	50.3	43.3	41.6	45.1	35.6	64	54.6	71.2	63.7	66.1	64.8	71.5	65.3	65.9	59.7	64.2 *	56	56	55	64	62	63	66
Sodium	mg/L	200	2290	2540	2560	2560	2460	2610	2620	2730	2280	2330	2660	2610	2610	2690	2660	2070	2540	2490	2360	2200	2440 *	2300	2500	2300	2400	2300	2400	2400
Potassium	mg/L	-	14.6	10.4	10.3	13.8	10	13	12	11	8.1	10	10.9	12.8	11.3	13.1	11.9	11.4	13	11.0	7.2	11.7	11.4 *	12	11	11	11	13	12	12
Iron	mg/L	0.3	0.46	0.02	0.064	<0.003	0.086	< 0.02	0.066	<0.1	<0.1	<0.1	0.69	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	0.035	<0.005	<0.0050	1.63 *	0.07	0.07	<0.060	<0.60	<0.60	<0.60	<0.60
Sulphate	mg/L	500	4770	5520	4990	5880	5450	5410	5240	6280	5420	5000	5490	5370	5050	5450	4960	3730	4850	4970	4480	4700	4550 *	5000	4900	5400	5200	4900	4900	4700
Chloride	mg/L	250	3.8	2.5	5.2	3.6	4	3.8	3.4	3.1	3.3	2.7	3	4	3	3	4	3	3	3	4	2.33	<10 *	3	2.2	2.6	2.2	2.6	1.9	3.7
Bicarbonate	mg/L	-	842	930	938	926	933	939	897	930	917	910	915	963	968	977	969	1200	1040	1050	1080	1070	1040	1000	1000	1100	1100	1000	1100	1100
Carbonate	mg/L	-	n/a	n/a	<6	<6	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.24	0.09	0.225	0.25	< 0.04	0.33	0.066	0.159	< 0.04	< 0.04	0.6	0.2	<0.5	0.2	0.2	0.2	0.3	0.1	<0.1	0.147	<1.0 *	0.24	0.073	0.26	0.36	0.072	0.32	0.85
TDS*	mg/L	500	7650	8760	8230	9070	8630	8720	8550	9710	8410	7990	8880	8700	8430	8860	8340	6590	8170	8230	7620	7660	7760	8100	8200	8500	8400	7900	8000	7900
Water Nutrients																														
Ammonia-N	mg/L	-	0.91	1.91	1.69	1.55	0.8	1.15	1.56	1.56	1.23	1.79	0.1	1.12	0.46	1.30	1.10	<0.05	0.32	0.52	0.56	0.652	0.311	0.42	0.3	0.39	0.18	0.42	<0.050	0.39
TKN	mg/L	-	1.45	2.36	2.39	1.8	1.59	1.25	2.78	1.9	1.64	3.12	<0.2	1.2	0.7	1.6	1.3	0.4	0.6	0.9	1.2	1.37	1.37	0.91	0.76	1.1	0.56	0.76	0.46	0.67
Hydrocarbons																														
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	0.061	<0.25	<0.1	0.23	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																														
COD	mg/L	-	69	30	17	20	19	16	71	14	19	46	< 10	< 10	19	20	23	19	19	18	27	18.8	12.6	37	30	45	47	23	22	22
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7	6.8	7.2	9.6	6.5	7.1	5.8	7.4	5.5	9.5
Metals																														
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0081	<0.0030
Antimony	mg/L	0.006	<0.005	0.007	<0.006	<0.006	<0.05	<0.02	<0.02	<0.002	<0.002	<0.002	0.006	0.0011	0.0008	<0.0004	0.0007	0.0005	<0.0004	0.0007	n/a	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00024	0.0003
Barium	mg/L	1	0.0741	0.0184	0.0118	0.0121	0.01	0.02	0.0095	0.011	<0.01	0.012	0.012	0.012	0.012	0.014	0.011	0.011	0.012	0.009	0.012	0.0111	0.0159	<0.01	<0.010	<0.010	<0.10	<0.10	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.35	0.40	0.36
Cadmium	mg/L	0.005	0.0007	<0.0005	<0.0006	<0.0006	<0.005	<0.003	<0.003	<0.0001	<0.0001	0.00011	<0.001	<0.001	0.0007	<0.0001	0.0001	<0.0001	<0.0001	0.0003	<0.001	<0.0010	0.000335	0.00014	0.000083	0.00062	0.00005	<0.00020	0.00028	0.000047
Chromium	mg/L	0.05	0.0018	<0.0008	<0.0009	<0.0009	<0.008	<0.004	<0.004	<0.005	< 0.005	<0.005	<0.005	0.014	<0.005	0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0010
Cobalt	mg/L	-	0.0032	0.0041	0.0058	0.005	0.019	0.014	0.018	0.0019	<0.001	0.0013	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	0.0023	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.00033
Copper	mg/L	1	0.005	0.009	0.006	0.005	<0.01	<0.005	0.006	0.011	<0.01	0.016	0.032	0.039	0.024	0.010	0.009	0.008	0.005	0.005	0.01	0.0092	0.0168	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.0013	<0.00020
Lead	mg/L	0.01	<0.002	0.005	<0.002	<0.002	<0.02	0.012	<0.01	<0.001	<0.001	<0.001	<0.005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.005	<0.0050	0.00236	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.14	0.065	0.12
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000025	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.003	0.004	0.002	< 0.001	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.0005	0.00025
Nickel	mg/L	-	0.016	0.042	0.014	0.009	<0.01	0.016	0.026	<0.005	<0.005	<0.005	<0.002	0.002	<0.002	<0.002	<0.002	0.004	<0.002	0.005	0.005	0.0054	0.0072	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0028	0.0012
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0023	0.0020	0.0035
Zinc	mg/L	5	0.0354	0.0314	0.016	0.0208	0.02	0.014	0.0035	0.02	<0.01	0.016	0.04	0.038	0.033	0.016	0.016	<0.002	0.034	0.023	0.016	0.0076	0.0099	<0.03	<0.030	<0.030	<0.030	<0.030	0.0039	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	4.463
Volume Purged (L)	16
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	4.463

Table E24A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 24A																
			Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																			
Field pH	-	-	7.95	7.59	7.69	7.63	8.26	7.73	7.72	7.85	7.783	8.03	7.9	7.69	6.74	7.9	8.1	7.85	7.7
Field EC	mS	-	n/a	6.55	19.95 (EF)	6.32	2.22	14.86	14.62	5.8	6.040	15.4	6.5	2.66	7.17	6.24	6.57	6.91	12.15
Field Temperature	°C	-	n/a	9.5	8.4	8.0	6.0	4.3	10.83	5.10	6.40	18.3	9.3	8.7	10.1	9.9	8.0	8.5	7.6
Routine Water																			
pH	-	6.5 - 8.5	8.3	8.3	8.3	8.2	8.4	8.3	8.1	8.2	8.24	8.13	8.13	8.21	8.24	8.28	7.98	8.08	7.96
Conductivity (EC)	µS/cm	-	6110	6100	5600	6210	6210	6350	6310	5.97	6150	6140	6300	6200	6300	6200	6200	6100	12000
Calcium	mg/L	-	74.7	88.4	91.1	87.4	84.1	79.1	82.7	77.4	71.2	68.5	71	73	64	80	67	69	260
Magnesium	mg/L	-	12.6	10.3	11.6	10.3	11.2	9.7	9.5	9.9	8.59	8.37	8.7	8.1	7.3	9.7	7.5	7.9	180
Sodium	mg/L	200	1530	1520	1620	1520	1510	1520	1570	1490	1450	1410	1700	1600	1400	1500	1500	1400	3100
Potassium	mg/L	-	6.9	6.2	6.4	6.6	6.8	6.8	6.6	3.9	6.29	5.8	5.2	5.8	5.3	5.2	5.6	5.6	11
Iron	mg/L	0.3	<0.005	0.013	0.184	<0.005	<0.005	0.007	0.113	<0.005	<0.05	0.017	<0.06	<0.060	<0.060	1.1	<0.060	<0.60	<0.60
Sulphate	mg/L	500	2970	2720	3010	2910	2790	2730	2910	2670	2740	2730 *	2800	2900	3000	3100	2900	2800	6400
Chloride	mg/L	250	5	4	5	6	5	5	4	5	4.02	<10 *	4	4	3.9	4.3	5.0	4.0	16
Bicarbonate	mg/L	-	n/a	716	701	701	662	708	710	737	728	706	700	700	720	720	710	710	970
Carbonate	mg/L	-	<5	<5	5	<5	16	6	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.1	<0.1	<0.1	0.5	0.2	0.6	0.3	0.5	0.261	<1.0 *	1.8	0.91	1.5	1.1	1.2	1.2	9.2
TDS*	mg/L	500	4950	4700	5090	4890	4750	4710	4930	4620	4640	4570	4900	5000	4900	5100	4800	4700	10000
Water Nutrients																			
Ammonia-N	mg/L	-	1.65	0.09	2.15	1.91	1.96	1.67	1.88	1.7	1.59	0.815	1.5	1.5	1.2	0.84	1.1	0.061	1.3
TKN	mg/L	-	1.9	0.7	2.6	2.2	2.3	2.1	1.6	2.2	2.25	1.5	1.8	1.9	1.8	1.4	1.5	0.45	2.7
Hydrocarbons																			
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																			
COD	mg/L	-	<10	20	18	19	10	15	15	19	15.3	15.6	37	41	23	27	37	16	84
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	4.9	5.5	5.7	5	5.2	4.5	5.3	4.3	38
Metals																			
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0049	0.0034
Antimony	mg/L	0.006	0.0012	0.0009	0.0005	0.0013	0.0010	0.0006	0.0009	n/a	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00045	0.0014
Barium	mg/L	1	0.045	0.04	0.043	0.041	0.033	0.032	0.027	0.028	0.0249	0.025	0.02	0.021	0.02	<0.10	0.018	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.79	0.84	0.62
Cadmium	mg/L	0.005	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0010	<0.000050	<0.000050	<0.050	0.000076	<0.000050	<0.00020	<0.000020	0.00009
Chromium	mg/L	0.05	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	0.00084
Copper	mg/L	1	0.024	0.019	0.009	0.006	0.007	0.006	0.003	0.007	0.0066	0.0076	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00069	0.004
Lead	mg/L	0.01	<0.005	0.0003	0.0002	0.0009	0.0002	<0.0001	<0.0001	<0.005	<0.0050	0.00011	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.055	0.065	0.38
Mercury	mg/L	0.001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000022	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.003	0.0028	0.0027	<0.0020	0.0021	0.0025	0.0057
Nickel	mg/L	-	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	0.004	0.003	0.0027	0.0034	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0019	0.016
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	0.0027
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0010	0.00090	0.25
Zinc	mg/L	5	0.023	0.449	0.012	0.016	0.006	0.028	0.007	0.006	0.011	0.0075	<0.03	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.464
Volume Purged (L)	44 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	3.205

Table E24B: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	MW 24B																
				Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Jan-07	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																				
Field pH	-	6.5-8.5	-	7.64	7.35	7.58	7.22	7.4	n/a[1]	7.51	7.08	7.87	7.48	7.66	7.45	7.33	6.22	7.8	7.5	6.15	7.3
Field EC	mS		-	n/a	10.3	24.4 (EF)	9.35	8.31	n/a[1]	9.87	21.97	8680	9.570	19.2	9.21	3.89	9.92	10.01	9.48	11.85	9.59
Field Temperature	°C		-	n/a	7.2	7.6	5.4	7.7	n/a[1]	4.2	10.57	4.5	4	16.1	10.5	8.2	10.1	4.9	7.8	n/a	7.3
Routine Water																				
pH	-	6.5-8.5	6.5 - 8.5	8.2	8.1	8.2	8	8.2	8.0	8.2	7.9	8.1	8.08	7.94	8.02	8.07	8.1	8.15	7.74	7.96	7.86
Conductivity (EC)	µS/cm	1000	-	10300	9150	8200	8860	9860	9440	10000	9570	8860	9560	9390	9500	9200	9000	9100	9000	9100	9200
Calcium	mg/L		-	240	257	241	240	256	261	247	241	225	234	203 *	190	240	240	270	280	320	360
Magnesium	mg/L		-	151	125	139	113	154	135	135	130	128	127	126 *	110	130	130	160	140	170	200
Sodium	mg/L	200	200	2700	2420	2520	2120	2450	2460	2440	2270	2140	2140	200 *	2300	2300	1900	2000	2000	1900	1900
Potassium	mg/L		-	14.4	10.3	12.3	10.1	13.2	12.8	11.9	8.5	4.7	10.7	10.5 *	9	10	9.4	9.1	10	12	10
Iron	mg/L	0.3	0.3	<0.005	<0.005	<0.005	<0.005	<0.005	n/a[1]	<0.005	0.007	<0.005	<0.050	<0.050 *	<0.06	<0.060	<0.060	<0.60	<0.060	<0.060	<0.60
Sulphate	mg/L	128|218|309|429	500	6210	5210	5300	4590	4980	4920	4820	4730	4280	4720	4310 *	4200	4700	4700	5100	4700	4400	4600
Chloride	mg/L	100	250	6	9	35	40	76	77	70	108	99	115	125 *	n/a	100	93	82	81	72	54
Bicarbonate	mg/L		-	961	941	1070	1030	1080	1090	1080	1150	1170	1150	1170	1200	1200	1200	1100	1100	1000	970
Carbonate	mg/L		-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hydroxide	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	3	10	<0.1	<0.5	<0.1	<0.1	0.4	<0.1	0.2	<0.1	<0.1	<0.050	<1.0 *	0.09	0.0055	0.022	0.013	0.014	<0.010	<0.22
TDS*	mg/L	500	500	9790	8490	8770	7620	8460	8400	8250	8050	7450	7910	7500	7500	8000	7600	8100	7700	7300	7600
Water Nutrients																				
Ammonia-N	mg/L		-	0.05	<0.05	<0.05	<0.05	<0.05	n/a	<0.05	<0.05	<0.05	<0.050	<0.050	0.07	<0.050	<0.05	0.064	0.094	0.11	0.035
TKN	mg/L		-	1.2	1.4	1.3	1.4	1.8	n/a	1.4	1.2	2	2.21	1.81	1.4	1.3	1.3	1.2	1.1	0.75	0.85
Hydrocarbons																				
Benzene	mg/L	0.005	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L		0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																				
COD	mg/L		-	50	78	85	78	87	n/a	79	77	69	75.5	74.8	98	73	68	58	62	47	44
DOC	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	28	27.5	29	25	22	24	19	19	19	16
Metals																				
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	<0.0030	0.0039
Antimony	mg/L	0.006	0.006	0.0013	0.0008	<0.0004	0.0010	0.0008	n/a	<0.0004	0.0008	n/a	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00085	0.00071
Barium	mg/L	1	1	0.047	0.026	0.023	0.022	0.017	n/a	0.017	0.021	0.023	0.0109	0.0215	0.012	0.011	0.012	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	1	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.24	0.26	0.24
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	n/a	<0.0001	<0.0001	0.001	<0.0010	<0.000050	<0.000050	<0.050	0.000066	0.000064	<0.00020	0.000047	0.000029
Chromium	mg/L		0.05	0.013	<0.005	0.008	<0.005	0.032	n/a	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L		-	<0.002	<0.002	<0.002	<0.002	<0.002	n/a	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	<0.00030
Copper	mg/L	0.007	1	0.044	0.03	0.016	0.011	0.014	n/a	0.011	0.008	0.01	0.0121	0.013	0.004	0.0044	0.0036	0.0042	0.0036	0.0041	0.0022
Lead	mg/L	38|0.004|0.0042|0.0	0.01	<0.005	<0.0001	<0.0001	0.0003	<0.0001	n/a	<0.0001	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0041	<0.0040	<0.040
Mercury	mg/L	0.00005	0.001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	n/a	<0.0001	0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000024	<0.0000050	<0.0000050	<0.0000050	0.0000029	<0.0000020
Molybdenum	mg/L		-	<0.005	<0.005	<0.005	<0.005	<0.005	n/a	<0.005	<0.005	0.023	<0.0050	<0.0050	0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.0023	0.0012
Nickel	mg/L	054|0.057|0.059|0.0	-	0.004	0.005	0.003	<0.002	0.032	n/a	0.009	0.017	0.014	0.0206	0.0358	0.05	0.049	0.055	0.06	0.06	0.071	0.068
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00035	0.00028
Uranium	mg/L	0.01	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.18	0.20	0.17
Zinc	mg/L	0.03	5	0.041	0.027	0.015	0.015	0.004	n/a	0.002	0.019	0.006	0.0041	0.0028	<0.03	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Insufficient amount of water available during time of sampling (n/a[1])

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	6.080
Volume Purged (L)	22 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	2.490

Table E25A: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	MW 25A															
				Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements																				
Field pH	-	6.5-8.5	-	7.95	7.82	8.13	7.62	8.02	8.21	7.71	8.274	8.900	8.41	8.4	8.42	8.02	10	8.6	8.39	8.4
Field EC	mS		-	n/a	2.54	5.33 (EF)	2.90	6.29	4.83	4.62	1.926	1.667	2.1	2.16	0.93	2.29	2.22	2.19	2.13	2.05
Field Temperature	°C		-	n/a	11.1	3.8	9.2	7.1	8.8	9.88	7.7	13.1	11.7	10.7	8.6	10.1	7.1	8.3	9.4	8.2
Routine Water																				
pH	-	6.5-8.5	6.5 - 8.5	8.5	8.4	8.5	8.4	8.7	8.7	8.5	8.4	8.59	8.59	8.56	8.67	8.53	8.28	8.39	8.45	8.55
Conductivity (EC)	µS/cm	1000	-	4660	2380	2120	2110	2070	2070	2080	2000	2100	2050	2100	2200	2100	2000	2100	2100	2000
Calcium	mg/L		-	43	10.7	7.2	6.8	7.2	5.3	5.3	5.6	5.02	5.01	4.7	5.4	4.7	4.7	4.6	5.1	4.5
Magnesium	mg/L		-	21.8	0.4	1.1	0.9	1.1	0.2	<0.1	0.7	0.51	0.57	0.5	0.59	0.5	0.49	0.44	0.47	0.42
Sodium	mg/L	200	200	1270	625	558	557	539	553	585	543	511	436	450	490	570	480	490	540	490
Potassium	mg/L		-	9.3	2.7	2.5	1.9	2.5	2.9	1.7	1.3	1.74	1.9	1.8	2	1.9	1.9	2.3	1.8	1.7
Iron	mg/L	0.3	0.3	3.32	0.358	0.516	0.0186	0.112	0.175	0.057	0.068	0.0525	0.095	<0.06	<0.060	<0.060	<0.060	<0.060	<0.060	<0.06
Sulphate	mg/L	128|218|309|429	500	2090	323	60.7	102	52.1	36.2	21.3	24.7	19.8	13.2	n/a	3.2	7.1	14	13	4.3	3.1
Chloride	mg/L	100	250	30	14	11	3	10	9	10	10	7.74	7.24	10	8.3	8.5	8	9.2	8.4	8.9
Bicarbonate	mg/L		-	812	1220	1350	1350	1260	1330	1400	1430	1360	1320	1300	1300	1400	1400	1400	1400	1400
Carbonate	mg/L		-	31	25	42	25	53	55	38	26	50.7	49	38	62	39	<0.50	11	19	28
Nitrate (N)	mg/L	3	10	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.050	<0.050	0.065	0.031	0.32	0.97	0.85	0.18	2
TDS*	mg/L	500	500	3900	1600	1340	1360	1280	1310	1350	1310	1270	1220	1200	1200	1300	1200	1200	1300	1200
Water Nutrients										y										
Ammonia-N	mg/L		-	0.68	0.42	0.54	0.83	0.85	0.62	0.68	0.68	0.68	0.281	0.67	1.2	0.59	0.42	0.41	0.62	0.55
TKN	mg/L		-	3.5	2.8	1.6	1.8	2.3	1	0.9	1.1	1.16	1.67	1.1	3.9	1.2	1.1	1.1	1.2	1.2
Hydrocarbons																				
Benzene	mg/L	0.005	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L		0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	n/a	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																				
COD	mg/L		-	40	35	15	24	21	23	18	28	21.7	19.6	40	190	29	32	35	29	25
DOC	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7	9	9.7	14	9.8	9.3	7.9	8.1	7.9	9.6
Metals																				
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0051	0.0046	0.0043
Antimony	mg/L	0.006	0.006	0.001	0.0114	0.0012	0.0018	0.0015	0.0012	0.0011	n/a	n/a	0.00086	0.0011	0.0033	0.0012	0.00078	0.0011	<0.00060	0.00064
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0021	0.0019	0.0023
Barium	mg/L	1	1	0.03	0.051	0.063	0.041	0.045	0.062	0.051	0.051	0.0547	0.0622	0.074	0.11	0.085	0.081	0.081	0.088	0.10
Boron	mg/L	1	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.81	0.94	0.83
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	<0.001	0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.001	<0.0010	0.000175	0.00011	0.000041	0.000033	<0.000025	0.000022	<0.000020	<0.000020
Chromium	mg/L		0.05	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L		-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	0.0006	0.00068	0.00037	0.00046	<0.00030	0.00034	0.00032
Copper	mg/L	0.007	1	0.012	0.01	0.003	0.003	0.003	0.001	0.002	0.004	<0.0010	0.0012	0.0018	0.0014	0.0022	0.0009	0.0009	0.00045	<0.00020
Lead	mg/L	38|0.004|0.0042|0.0	0.01	<0.005	0.0029	<0.0001	0.0003	0.0012	0.0004	0.0002	<0.005	<0.0050	0.0003	0.0002	0.00029	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.051	0.10	0.07
Mercury	mg/L	0.00005	0.001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000059	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L		-	0.008	0.021	0.008	0.011	0.007	0.007	<0.005	<0.005	<0.0050	0.0052	0.005	0.013	0.0044	0.0039	0.0051	0.0064	0.006
Nickel	mg/L	054|0.057|0.059|0.0	-	0.003	0.01	0.003	0.007	0.005	0.003	0.003	0.003	0.0033	0.003	0.0041	0.0054	0.0025	0.0025	0.0032	0.0023	0.0022
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00041	<0.00020	<0.00020
Uranium	mg/L	0.01	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	0.00074	0.0012
Zinc	mg/L	0.03	5	0.022	0.064	0.004	0.023	0.011	0.005	0.017	0.026	0.0395	0.0048	0.011	0.005	0.0033	<0.0030	<0.0030	<0.0030	<0.0030
Polycyclic Aromatic Hydrocarbons (PAHs)																				
Benzo[a]pyrene equivalency	mg/L	0.00001	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
2-methylnaphthalene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthene	mg/L	0.0058	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthylene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acridine	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020
Anthracene	mg/L	0.000012	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Benz(a)anthracene	mg/L	0.000018	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	0.000017	0.00001	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(e)pyrene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Chrysene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Fluoranthene	mg/L	0.00004	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Fluorene	mg/L	0.003	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Naphthalene	mg/L	0.001	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Perylene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Phenanthrene	mg/L	0.0004	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Pyrene	mg/L	0.000025	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000020	<0.000020
Quinoline	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.688
Volume Purged (L)	22 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	1.250

Table E25B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 25B															
			Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements																			
Field pH	-	-	7.49	7.36	7.35	7.3	7.49	7.59	7.44	7.444	7.410	7.58	7.5	7.3	5.91	7.4	7.8	7.56	7.4
Field EC	mS	-	n/a	8.38	18.83 (EF)	7.66	9.12	19.39	20.36	8.560	8.880	2.4	9.03	3.98	10.59	9.91	10.02	9.51	9.72
Field Temperature	°C	-	n/a	6.9	5.9	6.1	9.9	6.8	10.09	8.8	7.9	11.6	11.9	8.3	10.1	7.2	8.2	8.6	7.5
Routine Water																			
pH	-	6.5 - 8.5	8.4	8.2	8.3	8.0	8.3	8.2	8.0	8.1	8.09	8.11	8.05	7.84	8.19	8.12	7.85	8.09	8.14
Conductivity (EC)	µS/cm	-	4860	8300	7490	8100	8660	8970	9120	8790	8900	9200	9200	9200	9400	9400	9500	9500	9500
Calcium	mg/L	-	52.7	172	145	172	168	172	175	174	175	181 *	180	190	170	190	190	190	190
Magnesium	mg/L	-	44.8	42.2	43.4	42.3	45.7	50.4	51.6	50.8	47.9	48.2 *	48	50	47	54	53	51	54
Sodium	mg/L	200	1520	2150	2310	2170	2190	2260	2300	2180	2160	2180 *	2200	2500	2200	2300	2200	2100	2300
Potassium	mg/L	-	7	10.1	11.8	10.1	12.1	12.2	10.9	7.6	11.8	10.8 *	12	12	11	11	12	12	12
Iron	mg/L	0.3	0.266	0.009	<0.005	0.010	<0.005	0.006	<0.005	<0.005	<0.050	<0.050 *	<0.06	<0.060	<0.060	<0.60	<0.60	<0.060	<0.6
Sulphate	mg/L	500	2720	3880	4420	4290	4210	4140	4480	4090	4350	4370 *	4800	4700	5100	5200	4600	4500	4100
Chloride	mg/L	250	2	2	3	10	2	3	2	3	1.69	<10 *	3	1.4	2	1.9	2.2	2.5	2.3
Bicarbonate	mg/L	-	973	1050	1060	1040	988	1030	1070	1080	1060	1040	1000	1000	1000	1100	1000	970	1000
Carbonate	mg/L	-	21	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	< 0.1	<0.5	<0.1	0.3	0.3	0.3	<0.1	0.8	0.187	<1.0 *	0.12	0.09	0.5	0.42	0.77	0.62	2.5
TDS*	mg/L	500	4850	6770	7450	7210	7120	7140	7550	7040	7270	7300	7800	8000	8000	8300	7600	7300	7100
Water Nutrients																			
Ammonia-N	mg/L	-	0.45	1.21	1.44	0.95	1.37	0.79	1.08	0.42	0.637	0.224	0.77	0.82	0.56	0.59	0.29	0.58	0.44
TKN	mg/L	-	1	1.6	1.9	1.4	1.8	1	1.3	0.8	1.43	1.44	1.3	1.2	0.53	0.84	0.86	1.2	0.87
Hydrocarbons																			
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.0008
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Organics																			
COD	mg/L	-	30	25	26	26	27	25	19	34	22.6	19	42	36	42	35	29	30	27
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9	8.9	9.8	9.3	9.2	8.4	9	9.9	10	12
Metals																			
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0084	0.0053
Antimony	mg/L	0.006	0.0008	0.0014	0.0004	0.0008	0.0010	<0.0004	0.0006	n/a	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00055	0.00047
Barium	mg/L	1	0.056	0.038	0.031	0.025	0.027	0.018	0.019	0.02	0.0157	0.0217	0.01	0.012	0.015	<0.10	<0.10	0.011	<0.1
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.46	0.46	0.47
Cadmium	mg/L	0.005	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.001	<0.0010	<0.000050	0.00009	<0.050	0.000069	0.00021	<0.00020	<0.000020	<0.00002
Chromium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	0.0016	<0.001
Cobalt	mg/L	-	0.004	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.00075	0.00065
Copper	mg/L	1	0.01	0.021	0.01	0.007	0.009	0.005	0.005	0.01	0.0085	0.0098	<0.002	0.0036	<0.0020	<0.0020	<0.0020	0.00081	0.00041
Lead	mg/L	0.01	<0.005	0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.0002
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.17	0.18	0.21
Mercury	mg/L	0.001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00072	0.00067
Nickel	mg/L	-	0.006	0.005	0.004	0.002	0.008	<0.002	0.006	0.008	0.0058	0.0065	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0031	0.0028
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0010	0.00033	0.00028
Zinc	mg/L	5	0.016	0.028	0.013	0.024	0.005	0.264	0.016	0.018	0.0042	0.0074	<0.03	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.003
Polycyclic Aromatic Hydrocarbons (PAHs)																			
Benzo[a]pyrene equivalency	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
2-methylnaphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acridine	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020
Anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	0.00001	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(e)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Chrysene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Fluorene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Naphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000020	<0.000020
Quinoline	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	6.125
Volume Purged (L)	14 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	1.685

Table E26A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 26A																
			Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Jan-07	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements																				
Field pH	-	-	8.11	7.01	8.1	8.2	7.7	n/a	NM	8.62	n/a	8.4	8.51	8.48	8.1	8.31	9.9	n/a	n/a	-
Field EC	mS	-	n/a	n/a	8.18 (EF)	3.51	6.53	n/a	4.26	6.54	n/a	2.162	2.4	2.94	2.15	2.97	2.91	n/a	n/a	-
Field Temperature	°C	-	n/a	n/a	2.9	7.8	7.9	n/a	8.5	8.32	n/a	12.3	10.7	10.5	8.6	9.4	6.7	n/a	n/a	-
Routine Water																				
pH	-	6.5 - 8.5	8.5	8.5	8.5	8.6	8.4	8.4	8.4	8.5	8.5	8.61	8.57	8.58	8.68	8.58	8.45	8.38	8.53	8.56
Conductivity (EC)	µS/cm	-	2640	3930	3310	3010	6550	2980	2970	3020	2850	2900	2890	2900	2800	2,700	2700	2700	2600	2600
Calcium	mg/L	-	20.4	25.7	15.4	14.5	82.5	13.2	12.9	12.1	11.2	10	10.9	9.6	7.5	9.5	9.5	9.1	8.7	8.5 *
Magnesium	mg/L	-	3	9	5.0	3.5	52.9	3.0	2.6	1.8	2.3	1.84	1.88	1.6	1.1	1.4	1.4	1.2	1.1	1.2 *
Sodium	mg/L	200	769	938	798	750	1640	759	771	787	674	650	672	770	680	690	680	650	640	670 *
Potassium	mg/L	-	3.8	4.2	4.2	2.9	7.7	3.2	3.4	3.0	1.6	2.27	2.58	2.2	2.3	2.3	2.4	2.7	2.5	2.4 *
Iron	mg/L	0.3	3.77	0.09	0.239	0.043	0.011		0.083	0.059	0.017	<0.0050	0.026	<0.06	<0.060	<0.060	0.15	<0.060	0.084	<0.060 *
Sulphate	mg/L	500	812	1240	948	783	2970	720	731	756	629	633	651	680	730	610	610	520	490	510
Chloride	mg/L	250	15	5	9	6	2	6	6	6	5	4.89	3.75	6	5.4	5.8	5.9	5.3	5.0	5.4
Bicarbonate	mg/L	-	968	930	965	989	907	1010	1020	988	1030	999	967	1000	970	1,000	1000	1100	1100	1100
Carbonate	mg/L	-	31	22	38	32	20	16	12	31	24	43.4	40.3	29	41	34	15	8.6	23	23
Nitrate (N)	mg/L	10	0.2	1.2	0.4	1.1	0.1	1.2	1.6	1.5	1.7	1.29	1.01	3.4	1.5	1.8	1.6	0.94	1.0	5.7
TDS	mg/L	500	2130	2710	2290	2080	5220	2020	2050	2090	1860	1840	1860	2000	2000	1,900	1800	1700	1700	1700
Water Nutrients										.										
Ammonia-N	mg/L	-	0.75	0.2	0.96	0.27	0.58	n/a	<0.05	<0.05	<0.05	<0.050	0.209	<0.05	<0.050	<0.05	<0.050	<0.050	<0.050	<0.015
TKN	mg/L	-	1.8	4.4	2.3	1.0	0.9	n/a	0.8	0.6	0.7	0.49	1.34	0.58	0.89	1.2	0.78	1.7	1.2	0.77
Hydrocarbons																				
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	0.071	<0.25	<0.1	<0.10	<0.21	<0.10	<0.26	<0.10	<0.10
Organics																				
COD	mg/L	-	40	37	25	24	30	n/a	24	25	24	20.9	15.8	33	50	77	29	n/a	51	26
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8	8.7	8.9	9.9	9.8	9.8	7.8	9.3	10	-
Metals																				
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0049	0.15	0.0099 *
Antimony	mg/L	0.006	0.002	0.0018	0.0013	0.0014	0.0005	n/a	0.0011	0.0008	n/a	n/a	<0.00040	<0.0006	<0.00060	0.00061	<0.00060	<0.00060	<0.00060	<0.00060 *
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0021	0.0024	0.0023 *
Barium	mg/L	1	0.096	0.018	0.015	0.029	0.017	n/a	0.034	0.029	0.031	0.036	0.0397	0.041	0.039	0.041	0.045	0.033	0.047	0.054 *
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.74	0.85	0.81 *
Cadmium	mg/L	0.005	< 0.001	<0.0001	<0.0001	0.0001	0.0001	n/a	<0.0001	<0.0001	<0.001	<0.0010	0.00005	0.000076	<0.050	0.00021	0.000034	<0.000020	<0.000020	<0.000020 *
Chromium	mg/L	0.05	0.006	0.007	<0.005	0.006	<0.005	n/a	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.001	<0.0010	0.0015	0.0012	<0.0010	<0.0010	<0.0010 *
Cobalt	mg/L	-	0.004	<0.002	<0.002	<0.002	<0.002	n/a	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0003	<0.00030	0.00032	0.00034	<0.00030	<0.00030	<0.00030 *
Copper	mg/L	1	0.011	0.006	0.007	0.007	0.006	n/a	0.003	0.002	0.016	0.0028	0.0031	0.0016	0.00068	0.0020	0.0018	0.0015	0.0058	0.004 *
Lead	mg/L	0.01	< 0.005	0.0004	<0.0001	0.0052	<0.0001	n/a	0.0004	0.0010	<0.005	<0.0050	0.00017	<0.0002	0.00022	<0.00020	0.0012	<0.00020	0.00083	<0.060 *
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0098	<0.0040	<0.0040 *
Mercury	mg/L	0.001	< 0.0002	<0.0001	<0.0001	<0.0001	<0.0001	n/a	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000021	<0.000010	<0.0000050	<0.0000050	<0.0000020	-
Molybdenum	mg/L	-	0.025	0.008	0.008	0.005	<0.005	n/a	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.0034	0.0036	0.0034	0.0029	0.0020	0.0035	0.0026 *
Nickel	mg/L	-	0.016	0.004	0.010	0.003	0.004	n/a	<0.002	<0.002	<0.002	<0.0020	<0.0020	0.0015	0.0029	0.0019	0.0024	0.0017	0.0039	8.5 *
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	0.0019 *
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00063	0.00065	0.00063 *
Zinc	mg/L	5	0.013	0.011	0.005	0.010	0.008	n/a	0.015	0.037	0.022	0.0433	0.0079	0.014	0.0039	0.0064	0.013	<0.0030	<0.0030	0.0032 *

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Lab Filtered (*)

Not measured (NM)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.730
Volume Purged (L)	23 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	2.035

Table E26B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 26B																	
			Oct-03	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements																				
Field pH	-	-	n/a	7.46	7.05	7.37	7.26	7.44	7.38	7.98	8.060	7.382	7.9	7.67	7.35	5.62	7.7	7.5	7.63	7.4
Field EC	mS	-	n/a	n/a	6.92	15.11 (EF)	6.48	6.35	15.33	15.28	6.520	6.530	2.3	6.54	2.79	7.14	5.28	7.45	6.45	7810
Field Temperature	°C	-	n/a	n/a	7.7	6.3	5.7	8.3	6.0	9.68	6.6	7.0	11.8	9.1	9.2	8.1	5.8	9.1	8.9	5.9
Routine Water																				
pH	-	6.5 - 8.5	n/a	8.3	8.1	8.3	8.1	8.4	8.3	8.1	8.1	8.11	8.16	8.1	8.05	8.37	8.09	7.93	8.15	8.19
Conductivity (EC)	µS/cm	-	n/a	5980	6130	5520	6360	6440	6710	6660	6510	6560	6470	6400	6300	6400	6100	7100	7400	7600
Calcium	mg/L	-	n/a	102	89.2	83.3	91.6	87.5	88.1	89.1	90.9	88.1	78.4	78	89	74	73	100	110	120
Magnesium	mg/L	-	n/a	41.6	47.1	48.4	50.1	52.3	50.7	50.6	53.2	48.2	43.2	41	44	40	36	56	58	66
Sodium	mg/L	200	n/a	2200	1560	1620	1560	1600	1610	1640	1540	1560	1370	1500	1700	1500	1400	1600	1600	1800
Potassium	mg/L	-	n/a	12.2	5.6	6.4	6.4	7.5	8.0	6.5	3.8	6.97	6.42	6.4	6.4	5.9	5	8.3	7.7	7.5
Iron	mg/L	0.3	n/a	0.113	0.029	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.050	<0.010	<0.06	<0.060	<0.060	<0.060	<0.60	<0.060	<0.6
Sulphate	mg/L	500	n/a	4180	2690	2820	2870	2810	2740	2960	2820	2890	2480 *	2690	2900	3000	3000	3300	3400	3200
Chloride	mg/L	250	n/a	4	2	2	2	1	2	2	2	0.62	<10 *	2	<1.0	1.6	1.7	3.5	3.9	4.5
Bicarbonate	mg/L	-	n/a	973	1000	998	993	926	1010	1010	1040	1030	1000	980	1000	1000	960	1000	990	1000
Carbonate	mg/L	-		11	<5	<5	<5	18	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	15	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	n/a	<0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.050	<1.0 *	0.081	0.043	0.14	0.052	0.23	0.19	0.42
TDS*	mg/L	500	n/a	7030	4890	5070	5070	5030	5000	5250	5020	5100	4470	4700	5200	5100	4900	5600	5600	5700
Water Nutrients																				
Ammonia-N	mg/L	-	n/a	1.03	0.54	0.66	0.60	0.62	0.59	0.67	0.45	0.535	0.552	0.6	0.54	0.51	0.52	0.43	0.43	0.66
TKN	mg/L	-	n/a	1.6	1.1	1.0	1.0	1.1	1.0	1.0	0.9	1.28	1.57	1.3	0.98	1.1	0.89	0.86	0.73	0.99
Hydrocarbons																				
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																				
COD	mg/L	-	n/a	50	28	22	22	22	21	21	29	20.3	19.2	46	29	59	49	24	35	28
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9	8.2	8.9	8.6	8.3	8.7	7.3	9.0	10	12
Metals																				
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0095	0.0072
Antimony	mg/L	0.006	n/a	0.0012	0.0006	<0.0004	0.0010	0.0007	<0.0004	0.0007	n/a	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00081	0.00077
Barium	mg/L	1	n/a	0.071	0.031	0.025	0.019	0.018	0.015	0.013	0.011	0.0093	0.0146	0.01	0.01	0.01	0.01	<0.10	0.010	<0.1
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.30	0.32	0.29
Cadmium	mg/L	0.005	n/a	< 0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0010	0.00005	0.00007	0.0037	0.000056	<0.000050	<0.00020	<0.000020	<0.00002
Chromium	mg/L	0.05	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	0.0017	<0.001
Cobalt	mg/L	-	n/a	0.003	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	0.0025	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.00087	0.00081
Copper	mg/L	1	n/a	0.023	0.01	0.008	0.006	0.007	0.005	0.003	0.007	0.0063	0.0073	0.11	0.0049	<0.0020	<0.0020	<0.0020	0.0014	0.00039
Lead	mg/L	0.01	n/a	<0.005	0.0002	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.005	<0.0050	<0.00010	0.004	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.0002
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.20	0.20	0.22
Mercury	mg/L	0.001	n/a	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.00010	<0.00010	<0.000005	0.0000038	<0.0000050	<0.0000050	<0.0000050	0.0000040	<0.000002
Molybdenum	mg/L	-	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.002	0.0022	<0.0020	<0.0020	0.0024	0.0013	0.00087
Nickel	mg/L	-	n/a	0.012	0.003	0.002	<0.002	0.004	<0.002	0.003	0.004	0.0027	0.0056	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0029	0.0013
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.001	0.0012	0.00082
Zinc	mg/L	5	n/a	0.02	0.019	0.012	0.012	0.005	0.004	0.015	0.013	0.0105	0.0047	0.07	<0.030	<0.030	<0.030	<0.030	0.0084	<0.003
Polycyclic Aromatic Hydrocarbons (PAHs)																				
Benzo[a]pyrene equivalency	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0037	<0.000010	<0.000010
2-methylnaphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0019	<0.00010	<0.00010
Acenaphthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0019	<0.00010	<0.00010
Acenaphthylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0020	<0.00010	<0.00010
Acridine	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0014	<0.00020	<0.00020
Anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0020	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0016	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	0.00001	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0026	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0017	<0.000050	<0.000050
Benzo(e)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0014	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0014	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	<0.0000085	<0.0000085
Chrysene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0014	<0.0000075	<0.0000075
Fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0018	<0.000010	<0.000010
Fluorene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0018	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0014	<0.0000085	<0.0000085
Naphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0020	<0.00010	<0.00010
Perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	<0.000050	<0.000050
Phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0019	<0.000050	<0.000050
Pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0019	<0.000020	<0.000020
Quinoline	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0019	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)
Information not available (n/a)
Total Dissolved Solids, not a measured value (TDS)
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	6.020
Volume Purged (L)	26
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	1.644

Table E27A: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 27A										
			Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements													
Field pH	-	-	8.09	8.479	8.3	8.5	8.52	8.35	6.03	8.3	8.9	8.62	8.5
Field EC	mS	-	15.95	2.890	1.125	2.8	2.98	1.3	3.66	2.89	2.88	2.86	2810
Field Temperature	°C	-	9.44	5.5	9.0	10.7	10.6	8.1	6.3	7.0	10.3	6.2	8.2
Routine Water													
pH	-	6.5 - 8.5	8.5	8.5	8.64	8.59	8.53	8.45	8.64	8.52	8.38	8.57	8.6
Conductivity (EC)	µS/cm	-	3960	2990	2940	2790	2800	2700	2800	2800	2900	2800	2900
Calcium	mg/L	-	18.1	9.9	8.43	8.19	8.5	9.7	8.2	9.0	8.5	8.5	8.7
Magnesium	mg/L	-	10.3	4.1	2.66	1.79	1.5	1.5	1.4	1.2	1.1	1.0	1
Sodium	mg/L	200	1030	756	678	668	700	740	670	730	690	620	700
Potassium	mg/L	-	2.9	2.1	2.98	2.52	2.3	2.3	2.3	2.1	2.5	2.2	2.3
Iron	mg/L	0.3	0.012	0.057	1.09	0.112	<0.06	1.1	<0.060	0.46	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1260	775	681	630	710	630	730	770	730	710	720
Chloride	mg/L	250	10	7	5.26	4.42	8	4.4	5.8	6.2	5.2	5.0	6.9
Bicarbonate	mg/L	-	1010	992	924	898	900	940	910	920	930	850	920
Carbonate	mg/L	-	35	24	48.2	37.6	24	14	35	27	7.5	21	26
Nitrate (N)	mg/L	10	<0.1	0.1	0.273	0.419	0.21	0.093	0.14	0.11	0.046	0.21	0.47
TDS*	mg/L	500	2860	2070	1880	1800	1900	1900	1900	2000	1900	1800	1900
Water Nutrients													
Ammonia-N	mg/L	-	0.50	0.89	0.499	0.456	0.89	0.87	0.85	0.97	0.63	0.86	0.86
TKN	mg/L	-	1.1	1.3	1.08	1.57	1.5	1.4	1.4	1.2	1.2	0.76	1.2
Hydrocarbons													
Benzene	mg/L	0.005	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics													
COD	mg/L	-	34	41	35.1	30.4	40	48	49	43	34	39	30
DOC	mg/L	-	n/a	11	201	11.5	12	9.5	10	11	11	11	14
Metals													
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0043	0.073	0.029
Antimony	mg/L	0.006	0.0014	n/a	n/a	<0.00040	<0.006	<0.0030	0.0017	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0024	0.0028	0.003
Barium	mg/L	1	0.014	0.01	0.0163	0.0132	0.01	0.044	0.013	0.025	0.011	0.014	0.016
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.77	0.75	0.83
Cadmium	mg/L	0.005	<0.0001	<0.001	<0.0010	<0.000050	<0.000050	0.000027	0.000026	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.0050	<0.0010	0.0031	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0015	<0.00030	0.00066	<0.00030	0.00043	<0.00030
Copper	mg/L	1	0.002	0.004	0.0026	0.0027	<0.002	0.0038	0.0014	0.0019	0.00053	0.00098	0.0003
Lead	mg/L	0.01	<0.0001	<0.005	<0.0050	0.00012	<0.002	0.0015	<0.00020	0.00077	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.013	0.011	0.012
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000022	<0.0000050	<0.0000050	<0.0000050	0.0000021	<0.0000020
Molybdenum	mg/L	-	0.010	0.005	<0.0050	<0.0050	0.003	0.0031	0.0028	0.0019	0.0013	0.0023	0.0019
Nickel	mg/L	-	0.003	<0.002	0.0027	<0.0020	<0.005	0.0068	0.002	0.003	0.0012	0.0033	0.0014
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00055	0.00065	0.00057
Zinc	mg/L	5	0.011	0.008	0.0217	0.0045	<0.03	<0.015	0.0057	0.0049	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	10.918
Volume Purged (L)	21 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	0.498

Table E27B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 27B										
			Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements													
Field pH	-	-	7.23	7.818	7.6	7.96	7.86	7.62	6.2	7.5	8.1	7.74	7.6
Field EC	mS	-	20.75	8.250	>3.999	2.4	10.47	4.53	12.45	11.56	11.53	11.53	11.41
Field Temperature	°C	-	9.66	4.7	10.5	13.4	13	10.9	10.1	9.8	9.1	7.8	8.3
Routine Water													
pH	-	6.5 - 8.5	8.2	8.2	8.4	8.33	8.15	8.07	8.38	8.14	7.97	8.19	8.1
Conductivity (EC)	µS/cm	-	9620	8440	8320	8240	10000	10000	11000	11,000	11,000	11,000	12,000
Calcium	mg/L	-	91.5	83.4	74.4	71.2	100	130	110	130	130	140	140
Magnesium	mg/L	-	85.6	53	45.8	40.7	82	96	96	110	100	100	130
Sodium	mg/L	200	2530	2170	1980	1930	2600	2900	2900	2800	2700	2700	3100
Potassium	mg/L	-	8.6	4.1	9.01	8.13	9.1	9.5	9.3	9.2	11	11	11
Iron	mg/L	0.3	<0.005	<0.005	<0.0050	0.048	<0.06	0.088	<0.060	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	4520	3610	3580	3280 *	4700	5600	6000	6100	5100	5300	5100
Chloride	mg/L	250	41	41	35.6	28 *	37	36	37	40	35	42	51
Bicarbonate	mg/L	-	1420	1380	1270	1250	1400	1500	1600	1700	1700	1600	1900
Carbonate	mg/L	-	<5	<5	25.7	12.5	<0.5	<0.50	27	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.1	0.1	0.448	<1.0 *	0.11	0.11	0.35	0.29	1.1	0.91	1.5
TDS*	mg/L	500	7970	6640	6370	5990	8200	9500	9900	10,000	9000	9100	9400
Water Nutrients													
Ammonia-N	mg/L	-	0.63	0.98	0.571	0.625	0.72	0.6	0.53	0.51	0.15	0.42	0.67
TKN	mg/L	-	1.3	1.5	1.33	1.71	1.7	1.4	0.49	1.5	1.0	0.55	1.4
Hydrocarbons													
Benzene	mg/L	0.005	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics													
COD	mg/L	-	33	31	37.6	20.9	45	43	42	64	35	37	43
DOC	mg/L	-	n/a	11	253	10.2	12	12	14	13	13	15	18
Metals													
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.060	0.0056	0.01
Antimony	mg/L	0.006	0.0013	n/a	n/a	0.00049	<0.006	<0.012	<0.012	<0.012	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.0020	0.0019
Barium	mg/L	1	0.040	0.02	0.019	0.0194	0.02	0.013	0.013	<0.10	<0.10	<0.010	<0.1
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.42	0.43	0.46
Cadmium	mg/L	0.005	0.0001	<0.001	<0.0010	0.00013	0.00006	<0.10	0.00011	<0.0001	<0.00040	0.00004	0.000022
Chromium	mg/L	0.05	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.020	<0.020	<0.020	<0.020	0.0011	<0.0010
Cobalt	mg/L	-	0.006	<0.002	<0.0020	<0.0020	<0.003	<0.0060	<0.0060	<0.0060	<0.0060	0.0011	0.0012
Copper	mg/L	1	0.006	0.009	0.0079	0.0089	<0.002	0.0073	<0.0040	<0.0040	<0.0040	0.0010	<0.00020
Lead	mg/L	0.01	<0.0001	<0.005	<0.0050	0.00075	<0.002	<0.0040	<0.0040	<0.0040	<0.0040	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.052	0.052	0.062
Mercury	mg/L	0.001	0.0002	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.005	0.007	0.0057	<0.0050	0.002	<0.0040	<0.0040	<0.0040	<0.0040	0.0022	0.0018
Nickel	mg/L	-	0.019	0.009	0.0068	0.006	<0.005	<0.010	<0.010	<0.010	<0.010	0.0077	0.0051
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.00039	0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0021	0.0025	0.0034
Zinc	mg/L	5	0.018	0.01	0.007	0.0096	<0.03	<0.060	<0.060	<0.060	<0.060	0.0048	<0.0030
Polycyclic Aromatic Hydrocarbons (PAHs)													
Benzo[a]pyrene equivalency	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
2-methylnaphthalene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthylene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acridine	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.000050
Anthracene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	0.00001				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(e)pyrene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Chrysene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Fluoranthene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Fluorene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Naphthalene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Perylene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Phenanthrene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Pyrene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000020	<0.000020
Quinoline	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	0.957
Volume Purged (L)	22 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	0.957

Table E28A: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 28A				
			Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	8.28	8.4	8.4	8.51	8.5
Field EC	mS	-	3.66	3.63	3.59	3.38	3490
Field Temperature	°C	-	10	6.2	8.5	7.7	6.7
Routine Water							
pH	-	6.5 - 8.5	8.48	8.46	8.34	8.54	8.47
Conductivity (EC)	µS/cm	-	3400	3400	3400	3300	3300
Calcium	mg/L	-	14	13	13	12	13
Magnesium	mg/L	-	1.5	1.4	1.3	1.1	1.2
Sodium	mg/L	200	820	850	870	800	810
Potassium	mg/L	-	2.6	2.5	3.1	2.6	2.7
Iron	mg/L	0.3	<0.060	0.29	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1200	1200	1100	1000	1000
Chloride	mg/L	250	5	5.3	5.0	5.2	5
Bicarbonate	mg/L	-	820	830	850	780	850
Carbonate	mg/L	-	18	19	3.4	16	13
Nitrate (N)	mg/L	10	0.037	0.027	<0.010	0.066	0.044
TDS*	mg/L	500	2400	2500	2400	2200	2300
Water Nutrients							
Ammonia-N	mg/L	-	1.2	1.3	1.1	1.2	1.4
TKN	mg/L	-	1.6	1.6	1.6	1.7	1.6
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	47	42	39	31	28
DOC	mg/L	-	11	9.6	8.5	10	12
Metals							
Aluminum	mg/L	0.1	n/a	n/a	0.0046	0.012	0.005
Antimony	mg/L	0.006	0.00061	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	0.001	0.00084	0.00053
Barium	mg/L	1	0.013	0.015	<0.010	<0.010	<0.010
Boron	mg/L	5	n/a	n/a	0.74	0.77	0.82
Cadmium	mg/L	0.005	<0.000025	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00069	0.00062	<0.00030	0.00039	<0.00030
Copper	mg/L	1	0.0013	0.0021	0.00044	0.00085	<0.00020
Lead	mg/L	0.01	<0.00020	0.00022	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.029	<0.0040	0.019
Mercury	mg/L	0.001	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0035	0.0026	0.0021	0.0017	0.0016
Nickel	mg/L	-	0.0027	0.0024	0.0014	0.0018	0.00082
Selenium	mg/L	0.05	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	0.00056	0.00031	0.00025
Zinc	mg/L	5	<0.0030	0.0039	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	11.773
Volume Purged (L)	20 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.005

Table E28B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 28B				
			Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	7.55	7.4	7.8	7.58	7.5
Field EC	mS	-	11.63	12.78	13.02	12.86	12,890
Field Temperature	°C	-	9.1	6.5	7.2	7.8	6.2
Routine Water							
pH	-	6.5 - 8.5	8.07	8.08	7.9	8.14	8.08
Conductivity (EC)	µS/cm	-	12000	12000	12,000	13,000	12,000
Calcium	mg/L	-	210	230	220	210	220
Magnesium	mg/L	-	60	89	95	93	100
Sodium	mg/L	200	2700	3200	3000	2800	3200
Potassium	mg/L	-	9.4	11	13	13	12
Iron	mg/L	0.3	<0.060	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	6500	6900	6500	6700	5700
Chloride	mg/L	250	34	37	35	33	30
Bicarbonate	mg/L	-	1000	1100	1100	1000	1100
Carbonate	mg/L	-	<0.5	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.16	0.075	0.24	0.31	<0.22
TDS*	mg/L	500	10,000	11,000	10,000	10,000	9,700
Water Nutrients							
Ammonia-N	mg/L	-	2	1.6	1.2	1.4	1.6
TKN	mg/L	-	2.8	2.5	2.0	2.1	2.1
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	45	61	45	48	35
DOC	mg/L	-	19	15	16	17	17
Metals							
Aluminum	mg/L	0.1	n/a	n/a	<0.060	0.011	0.0039
Antimony	mg/L	0.006	0.00091	<0.012	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	<0.0040	0.00044	0.0004
Barium	mg/L	1	0.033	<0.10	<0.10	0.010	<0.10
Boron	mg/L	5	n/a	n/a	0.44	0.45	0.44
Cadmium	mg/L	0.005	0.00027	<0.00010	<0.00040	0.000034	0.000022
Chromium	mg/L	0.05	<0.0010	<0.020	<0.020	0.0012	<0.0010
Cobalt	mg/L	-	0.0051	<0.0060	<0.0060	0.0019	0.0015
Copper	mg/L	1	0.0021	<0.0040	<0.0040	0.0015	0.00033
Lead	mg/L	0.01	<0.00020	<0.0040	<0.0040	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.27	0.25	0.25
Mercury	mg/L	0.001	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0029	<0.0040	<0.0040	0.0009	0.00078
Nickel	mg/L	-	0.012	<0.010	<0.010	0.0049	0.0038
Selenium	mg/L	0.05	n/a	n/a	<0.0040	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	<0.0020	0.00062	0.00054
Zinc	mg/L	5	0.0037	<0.060	<0.060	0.0052	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Field Data - June 2017

Date	30-May-17
Well Depth (mbtoc)	7.103
Volume Purged (L)	23 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	1.848

Table E29A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 29A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.5	8.15	8.1
Field EC	mS	-	4.74	3.44	3740
Field Temperature	°C	-	6.7	7.0	6.5
Routine Water					
pH	-	6.5 - 8.5	8.28	8.41	8.34
Conductivity (EC)	µS/cm	-	4900	3400	3400
Calcium	mg/L	-	72	33	32
Magnesium	mg/L	-	9.9	5.1	5.2
Sodium	mg/L	200	1200	810	810
Potassium	mg/L	-	7.4	4.1	4.1
Iron	mg/L	0.3	<0.060	<0.060	<0.060
Sulphate	mg/L	500	2000	1200	1100
Chloride	mg/L	250	7.3	3.3	3.6
Bicarbonate	mg/L	-	680	710	760
Carbonate	mg/L	-	<0.50	7.7	3
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.054	0.063	0.33
Nitrite (N)	mg/L	-	0.084	0.014	1.1
Nitrate and Nitrate (N)	mg/L	-	0.14	0.077	-
TDS*	mg/L	500	3600	2400	2400
Hardness	mg/L	-	220	100	100
Alkalinity (total as CaCO3)	mg/L	-	560	590	630
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	6.4	2.5
Ionic Balance	N/A	-	1.0	1.0	2
Water Nutrients					
Ammonia-N	mg/L	-	4.3	1.2	1.4
TKN	mg/L	-	16	1.3	1.6
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	1100	55	25
DOC	mg/L	-	13	8.3	9.1
Metals					
Aluminum	mg/L	0.1	0.0048	0.0067	0.0079
Antimony	mg/L	0.006	0.0012	<0.00060	0.23
Arsenic	mg/L	0.01	0.0030	0.0011	0.00093
Barium	mg/L	1	0.021	0.015	0.018
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.50	0.75	0.74
Cadmium	mg/L	0.005	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00044	0.00061	0.00046
Copper	mg/L	1	0.0012	0.0020	0.00093
Lead	mg/L	0.01	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.081	0.064	0.06
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	0.0091	0.0017	0.0019
Nickel	mg/L	-	0.0036	0.0020	0.0014
Phosphorus	mg/L	-	<0.10	<0.10	<0.10
Selenium	mg/L	0.05	0.00039	0.00022	0.00027
Silicon	mg/L	-	1.7	3.6	3.7
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	1.4	0.67	0.68
Sulphur	mg/L	-	740	400	390
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0093	0.0006	0.00055
Vanadium	mg/L	-	<0.0010	0.0011	<0.0010
Zinc	mg/L	5	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	10.240
Volume Purged (L)	23 (de=ry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.878

Table E29B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 29B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	7.4	7.21	7.2
Field EC	mS	-	8.67	8.80	9230
Field Temperature	°C	-	7.1	7.7	6
Routine Water					
pH	-	6.5 - 8.5	7.62	7.85	7.9
Conductivity (EC)	µS/cm	-	8200	8400	8500
Calcium	mg/L	-	520	560	530
Magnesium	mg/L	-	260	230	240
Sodium	mg/L	200	1400	1600	1600
Potassium	mg/L	-	12	11	11
Iron	mg/L	0.3	<0.60	0.54	<0.60
Sulphate	mg/L	500	4700	5100	4700
Chloride	mg/L	250	5.7	5.2	6
Bicarbonate	mg/L	-	570	520	550
Carbonate	mg/L	-	<0.50	<0.50	0<0.5
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.39	0.11	<0.22
Nitrite (N)	mg/L	-	0.027	0.025	<0.16
Nitrate and Nitrate (N)	mg/L	-	0.42	0.13	-
TDS*	mg/L	500	7200	7700	7400
Hardness	mg/L	-	2300	2400	2300
Alkalinity (total as CaCO3)	mg/L	-	470	420	450
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	1.0	1.0	4.6
Water Nutrients					
Ammonia-N	mg/L	-	0.72	1.1	1.4
TKN	mg/L	-	4.5	0.96	1.8
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	150	41	45
DOC	mg/L	-	17	15	18
Metals					
Aluminum	mg/L	0.1	0.0041	0.022	0.01
Antimony	mg/L	0.006	0.0017	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0077	0.00054	0.00031
Barium	mg/L	1	<0.10	0.019	<0.10
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	<0.20	0.20	0.21
Cadmium	mg/L	0.005	0.00017	0.000082	0.00006
Chromium	mg/L	0.05	<0.0010	0.0014	<0.0010
Cobalt	mg/L	-	0.018	0.0056	0.0044
Copper	mg/L	1	0.0019	0.0019	0.00098
Lead	mg/L	0.01	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.55	0.65	0.67
Manganese	mg/L	0.05	0.77	0.85	0.88
Mercury	mg/L	0.001	<0.0000050	0.0000043	<0.0000020
Molybdenum	mg/L	-	0.016	0.00045	0.00057
Nickel	mg/L	-	0.048	0.0099	0.0075
Phosphorus	mg/L	-	<1.0	<0.10	<1.0
Selenium	mg/L	0.05	0.001	<0.00020	<0.00020
Silicon	mg/L	-	4.4	5.3	5.6
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	6.9	7.9	8
Sulphur	mg/L	-	1600	1800	1700
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.019	0.0042	0.0061
Vanadium	mg/L	-	<0.0010	0.0015	<0.0010
Zinc	mg/L	5	0.014	0.0051	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	5.46
Volume Purged (L)	15 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.92

Table E30A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 30A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.5	8.29	8.2
Field EC	mS	-	2.40	2.32	2020
Field Temperature	°C	-	7.5	8.7	7
Routine Water					
pH	-	6.5 - 8.5	8.34	8.37	8.57
Conductivity (EC)	µS/cm	-	2300	2200	1900
Calcium	mg/L	-	16	12	8.9
Magnesium	mg/L	-	2.2	1.6	1.4
Sodium	mg/L	200	540	540	460
Potassium	mg/L	-	2.9	2.4	2.2
Iron	mg/L	0.3	0.44	0.63	<0.06
Sulphate	mg/L	500	510	510	360
Chloride	mg/L	250	5.3	3.0	1.3
Bicarbonate	mg/L	-	770	780	770
Carbonate	mg/L	-	3.5	5.3	17
Hydroxide	mg/L	-	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	0.013	0.16	0.19
Nitrite (N)	mg/L	-	<0.033	0.046	0.081
Nitrate and Nitrate (N)	mg/L	-	0.023	0.21	-
TDS*	mg/L	500	1500	1500	1200
Hardness	mg/L	-	48	36	28
Alkalinity (total as CaCO3)	mg/L	-	640	650	660
Alkalinity (pp as CaCO3)	mg/L	-	2.9	4.5	14
Ionic Balance	N/A	-	1.0	1.0	0.27
Water Nutrients					
Ammonia-N	mg/L	-	0.78	0.42	0.46
TKN	mg/L	-	2.6	1.1	0.8
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	130	43	23
DOC	mg/L	-	15	9.9	7.8
Metals					
Aluminum	mg/L	0.1	1.0	3.8	0.011
Antimony	mg/L	0.006	0.0008	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0037	0.0030	0.00089
Barium	mg/L	1	0.028	0.025	0.015
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.43	0.52	0.40
Cadmium	mg/L	0.005	0.00004	0.000026	<0.000020
Chromium	mg/L	0.05	0.0016	0.0045	<0.0010
Cobalt	mg/L	-	0.0012	0.0012	<0.00030
Copper	mg/L	1	0.0056	0.0075	0.00034
Lead	mg/L	0.01	0.00077	0.00054	<0.00020
Lithium	mg/L	-	0.11	0.13	0.16
Manganese	mg/L	0.05	0.081	0.059	0.018
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.013	0.0082	0.0015
Nickel	mg/L	-	0.013	0.010	0.0023
Phosphorus	mg/L	-	<0.10	0.11	0.1
Selenium	mg/L	0.05	0.0012	0.00064	<0.00020
Silicon	mg/L	-	3.4	3.7	3.9
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.15	0.13	0.14
Sulphur	mg/L	-	190	170	120
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	0.033	0.084	<0.0010
Uranium	mg/L	0.02	0.0063	0.0035	0.00018
Vanadium	mg/L	-	0.0034	0.0090	0.011
Zinc	mg/L	5	0.0034	0.0037	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	8.85
Volume Purged (L)	20 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	3.475

Table E30B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 30B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.1	8.19	7.9
Field EC	mS	-	2.83	2.65	2680
Field Temperature	°C	-	6.5	7.4	5.6
Routine Water					
pH	-	6.5 - 8.5	8.06	8.44	8.32
Conductivity (EC)	µS/cm	-	2700	2600	2500
Calcium	mg/L	-	29	26	24
Magnesium	mg/L	-	9.1	9.5	8.9
Sodium	mg/L	200	680	610	560
Potassium	mg/L	-	3.3	3.2	2.9
Iron	mg/L	0.3	<0.060	<0.060	<0.060
Sulphate	mg/L	500	830	830	750
Chloride	mg/L	250	1.4	1.5	1.8
Bicarbonate	mg/L	-	670	610	680
Carbonate	mg/L	-	<0.50	8.0	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	1.3	0.12	1.5
Nitrite (N)	mg/L	-	<0.010	0.012	<0.033
Nitrate and Nitrate (N)	mg/L	-	1.3	0.13	-
TDS*	mg/L	500	1900	1800	1700
Hardness	mg/L	-	110	100	97
Alkalinity (total as CaCO3)	mg/L	-	550	520	560
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	6.7	<0.5
Ionic Balance	N/A	-	1.1	1.0	0.76
Water Nutrients					
Ammonia-N	mg/L	-	0.16	<0.050	<0.015
TKN	mg/L	-	0.49	0.40	0.6
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	110	44	38
DOC	mg/L	-	8.4	9.1	10
Metals					
Aluminum	mg/L	0.1	<0.030	0.011	0.0039
Antimony	mg/L	0.006	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.01	0.0024	0.0010	0.00068
Barium	mg/L	1	0.022	0.022	0.024
Beryllium	mg/L	-	<0.010	<0.0010	<0.001
Boron	mg/L	5	0.11	0.14	0.12
Cadmium	mg/L	0.005	<0.00020	<0.000020	<0.00002
Chromium	mg/L	0.05	<0.010	0.0012	<0.001
Cobalt	mg/L	-	<0.0030	<0.00030	<0.0003
Copper	mg/L	1	0.0035	0.0024	0.00083
Lead	mg/L	0.01	<0.0020	<0.00020	<0.0002
Lithium	mg/L	-	0.21	0.24	0.24
Manganese	mg/L	0.05	0.068	<0.0040	<0.004
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	0.0028	0.0011	0.00092
Nickel	mg/L	-	0.0053	0.0023	0.001
Phosphorus	mg/L	-	<0.10	<0.10	0.13
Selenium	mg/L	0.05	<0.0020	0.00024	0.00046
Silicon	mg/L	-	4.6	4.7	4.8
Silver	mg/L	-	<0.0010	<0.00010	<0.0001
Strontium	mg/L	-	0.37	0.33	0.35
Sulphur	mg/L	-	260	290	250
Thallium	mg/L	-	<0.0020	<0.00020	<0.0002
Tin	mg/L	-	<0.010	<0.0010	<0.001
Titanium	mg/L	-	<0.010	<0.0010	<0.001
Uranium	mg/L	0.02	0.0053	0.0032	0.0038
Vanadium	mg/L	-	<0.010	0.0019	<0.001
Zinc	mg/L	5	<0.030	0.0064	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	5.433
Volume Purged (L)	10 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	3.440

Table E31A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 31A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.6	8.53	-
Field EC	mS	-	1.98	1.72	-
Field Temperature	°C	-	10.5	9.5	-
Routine Water					
pH	-	6.5 - 8.5	8.57	8.53	8.57
Conductivity (EC)	µS/cm	-	1900	1800	1700
Calcium	mg/L	-	7.8	4.5	4.9 *
Magnesium	mg/L	-	3.1	<2.0	0.52 *
Sodium	mg/L	200	420	430	470
Potassium	mg/L	-	3.2	<3.0	1.9 *
Iron	mg/L	0.3	9.0	<0.60	0.18 *
Sulphate	mg/L	500	220	120	76
Chloride	mg/L	250	12	6.7	5.2
Bicarbonate	mg/L	-	920	940	1000
Carbonate	mg/L	-	22	18	23
Hydroxide	mg/L	-	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	0.017	2.0	14
Nitrite (N)	mg/L	-	0.013	0.028	0.077
Nitrate and Nitrate (N)	mg/L	-	0.03	2.0	3.2
TDS*	mg/L	500	1100	1000	1100
Hardness	mg/L	-	32	11	15
Alkalinity (total as CaCO3)	mg/L	-	790	800	880
Alkalinity (pp as CaCO3)	mg/L	-	19	15	19
Ionic Balance	N/A	-	0.94	1.0	3.2
Water Nutrients					
Ammonia-N	mg/L	-	1.1	1.1	1.2
TKN	mg/L	-	5.2	1.0	7.4
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	560	380	300
DOC	mg/L	-	19	17	-
Metals					
Aluminum	mg/L	0.1	1.5	0.31	0.55 *
Antimony	mg/L	0.006	0.0013	<0.00060	0.00077 *
Arsenic	mg/L	0.01	0.0069	0.00088	0.0042 *
Barium	mg/L	1	0.097	<0.10	0.085 *
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010 *
Boron	mg/L	5	0.58	0.66	0.74 *
Cadmium	mg/L	0.005	0.000048	<0.000020	0.000025 *
Chromium	mg/L	0.05	0.0017	<0.0010	<0.0010 *
Cobalt	mg/L	-	0.0034	0.00039	0.0016 *
Copper	mg/L	1	0.0093	0.00093	0.0046 *
Lead	mg/L	0.01	0.0021	0.00043	0.00043 *
Lithium	mg/L	-	0.064	<0.20	0.086 *
Manganese	mg/L	0.05	0.068	<0.040	0.036 *
Mercury	mg/L	0.001	0.000008	0.000043	<0.0000020 *
Molybdenum	mg/L	-	0.023	0.0021	0.019 *
Nickel	mg/L	-	0.020	0.0026	0.012 *
Phosphorus	mg/L	-	0.12	<1.0	<0.10 *
Selenium	mg/L	0.05	0.0013	<0.00020	0.00078 *
Silicon	mg/L	-	55	2.7	3.1 *
Silver	mg/L	-	<0.00010	<0.00010	<0.00010 *
Strontium	mg/L	-	0.10	<0.20	0.11 *
Sulphur	mg/L	-	75	40	24 *
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020 *
Tin	mg/L	-	<0.0010	<0.0010	<0.0010 *
Titanium	mg/L	-	0.030	0.0032	0.0094 *
Uranium	mg/L	0.02	0.0095	0.00054	0.0041 *
Vanadium	mg/L	-	0.0028	<0.0010	0.0013 *
Zinc	mg/L	5	0.0051	<0.0030	<0.0030 *

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Laboratory filtered (*)

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	9.660
Volume Purged (L)	20 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	2.413

Table E31B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 31B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.4	8.33	8.1
Field EC	mS	-	2.53	2.50	2660
Field Temperature	°C	-	8.0	9.4	8.1
Routine Water					
pH	-	6.5 - 8.5	8.29	8.56	8.4
Conductivity (EC)	µS/cm	-	2400	2500	2500
Calcium	mg/L	-	15	15	14
Magnesium	mg/L	-	4.3	5.4	5.6
Sodium	mg/L	200	550	590	570
Potassium	mg/L	-	3.7	3.6	3.3
Iron	mg/L	0.3	0.75	0.26	<0.060
Sulphate	mg/L	500	670	750	780
Chloride	mg/L	250	1.1	1.4	1.4
Bicarbonate	mg/L	-	690	610	640
Carbonate	mg/L	-	<0.50	13	5.2
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.046	<0.010	0.8
Nitrite (N)	mg/L	-	<0.010	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	0.046	<0.020	-
TDS*	mg/L	500	1600	1700	1700
Hardness	mg/L	-	55	59	59
Alkalinity (total as CaCO3)	mg/L	-	570	520	530
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	11	4.3
Ionic Balance	N/A	-	0.99	1.0	1.7
Water Nutrients					
Ammonia-N	mg/L	-	0.59	0.13	0.034
TKN	mg/L	-	2.2	0.38	0.51
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	0.12	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	140	28	30
DOC	mg/L	-	9	8.2	8.8
Metals					
Aluminum	mg/L	0.1	0.70	0.084	0.011
Antimony	mg/L	0.006	0.00095	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0094	0.0017	0.0011
Barium	mg/L	1	0.024	0.023	0.022
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.16	0.20	0.17
Cadmium	mg/L	0.005	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0021	0.00053	<0.0003
Copper	mg/L	1	0.0022	0.0022	0.00027
Lead	mg/L	0.01	0.00048	<0.00020	<0.00020
Lithium	mg/L	-	0.12	0.16	0.15
Manganese	mg/L	0.05	0.061	0.041	0.017
Mercury	mg/L	0.001	<0.0000050	0.0000027	<0.0000020
Molybdenum	mg/L	-	0.0058	0.0015	0.0014
Nickel	mg/L	-	0.0086	0.0033	0.00081
Phosphorus	mg/L	-	<0.10	<0.10	0.13
Selenium	mg/L	0.05	0.00064	<0.00020	<0.00020
Silicon	mg/L	-	5.2	3.9	3.6
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.17	0.23	0.24
Sulphur	mg/L	-	220	270	250
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	0.018	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0034	0.00099	0.0012
Vanadium	mg/L	-	0.0024	0.0011	<0.0010
Zinc	mg/L	5	<0.0030	0.0078	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	3.880
Volume Purged (L)	10 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.104

Table E32A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 32A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.2	7.79	7.6
Field EC	mS	-	8.66	7.91	8490
Field Temperature	°C	-	7.6	8.2	7.3
Routine Water					
pH	-	6.5 - 8.5	8.16	8.25	8.12
Conductivity (EC)	µS/cm	-	8200	8100	8000
Calcium	mg/L	-	120	120	120
Magnesium	mg/L	-	15	15	15
Sodium	mg/L	200	2000	2000	2000
Potassium	mg/L	-	11	8.4	7.7
Iron	mg/L	0.3	<0.60	0.12	<0.60
Sulphate	mg/L	500	4100	3900	3400
Chloride	mg/L	250	8.9	3.1	3.2
Bicarbonate	mg/L	-	960	980	1000
Carbonate	mg/L	-	<0.50	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.050	<0.22
Nitrite (N)	mg/L	-	0.013	<0.050	0.71
Nitrate and Nitrate (N)	mg/L	-	0.013	<0.020	-
TDS*	mg/L	500	6700	6500	6100
Hardness	mg/L	-	370	360	350
Alkalinity (total as CaCO3)	mg/L	-	790	800	850
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	0.92	1.0	4.4
Water Nutrients					
Ammonia-N	mg/L	-	3.5	2.9	3.2
TKN	mg/L	-	6.8	3.2	3.2
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	410	26	19
DOC	mg/L	-	12	7.9	7.2
Metals					
Aluminum	mg/L	0.1	<0.030	0.029	0.008
Antimony	mg/L	0.006	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0041	0.00051	0.00037
Barium	mg/L	1	<0.10	0.015	<0.10
Beryllium	mg/L	-	<0.010	<0.0010	<0.0010
Boron	mg/L	5	0.85	1.2	1.2
Cadmium	mg/L	0.005	<0.00020	<0.000020	0.000021
Chromium	mg/L	0.05	<0.010	0.0015	<0.0010
Cobalt	mg/L	-	<0.0030	0.00077	0.00062
Copper	mg/L	1	<0.0020	0.0031	0.00073
Lead	mg/L	0.01	<0.0020	<0.00020	<0.00020
Lithium	mg/L	-	0.36	0.47	0.49
Manganese	mg/L	0.05	0.15	0.12	0.14
Mercury	mg/L	0.001	<0.0000050	0.0000023	<0.0000020
Molybdenum	mg/L	-	0.014	0.00054	0.00068
Nickel	mg/L	-	0.011	0.0032	0.0016
Phosphorus	mg/L	-	<1.0	<0.10	<1.0
Selenium	mg/L	0.05	<0.0020	<0.00020	<0.00020
Silicon	mg/L	-	2.4	5.2	5.3
Silver	mg/L	-	<0.0010	<0.00010	<0.00010
Strontium	mg/L	-	2.6	2.9	3.0
Sulphur	mg/L	-	1300	1300	1300
Thallium	mg/L	-	<0.0020	<0.00020	<0.00020
Tin	mg/L	-	<0.010	<0.0010	<0.0010
Titanium	mg/L	-	<0.010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0080	0.00016	0.00014
Vanadium	mg/L	-	<0.010	<0.0010	<0.0010
Zinc	mg/L	5	<0.030	0.015	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	10.115
Volume Purged (L)	32 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.248

Table E32B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 32B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	7.7	7.69	7.4
Field EC	mS	-	12.55	13.26	13,010
Field Temperature	°C	-	7.6	9.1	6.8
Routine Water					
pH	-	6.5 - 8.5	7.73	7.97	7.98
Conductivity (EC)	µS/cm	-	12,000	13,000	12,000
Calcium	mg/L	-	210	230	210
Magnesium	mg/L	-	100	120	100
Sodium	mg/L	200	2800	3200	3000
Potassium	mg/L	-	18	17	15
Iron	mg/L	0.3	<0.60	<0.60	<0.60
Sulphate	mg/L	500	6300	6800	5700
Chloride	mg/L	250	110	120	120
Bicarbonate	mg/L	-	1300	1300	1300
Carbonate	mg/L	-	<0.50	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.050	<0.050	<0.22
Nitrite (N)	mg/L	-	<0.050	<0.050	<0.16
Nitrate and Nitrate (N)	mg/L	-	<0.050	<0.020	-
TDS*	mg/L	500	10,000	11,000	9,800
Hardness	mg/L	-	930	1100	950
Alkalinity (total as CaCO3)	mg/L	-	1100	1100	1000
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	0.91	0.97	1.9
Water Nutrients					
Ammonia-N	mg/L	-	1.3	1.5	1.5
TKN	mg/L	-	3.5	2.6	2.3
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	210	78	74
DOC	mg/L	-	18	15	17
Metals					
Aluminum	mg/L	0.1	0.0045	0.0038	0.016
Antimony	mg/L	0.006	0.0016	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.012	0.0016	0.00085
Barium	mg/L	1	<0.10	<0.10	<0.10
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.40	0.48	0.46
Cadmium	mg/L	0.005	0.00011	0.00046	0.000083
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0093	0.0054	0.0028
Copper	mg/L	1	0.0012	0.0036	0.0022
Lead	mg/L	0.01	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.43	0.54	0.47
Manganese	mg/L	0.05	0.68	0.85	0.67
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0089	0.0016	0.0012
Nickel	mg/L	-	0.031	0.013	0.0066
Phosphorus	mg/L	-	<1.0	<1.0	<1.0
Selenium	mg/L	0.05	0.00079	0.00046	<0.00020
Silicon	mg/L	-	3.9	4.7	4.7
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	4.3	5.1	4.7
Sulphur	mg/L	-	2000	2300	2000
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0027	0.00085	0.00084
Vanadium	mg/L	-	<0.0010	<0.0010	<0.0010
Zinc	mg/L	5	0.0055	0.0040	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	4.822
Volume Purged (L)	13 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	2.314

Table E33A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 33A		
			May-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.6	8.66	-
Field EC	mS	-	2.54	2.01	-
Field Temperature	°C	-	6.9	7.0	-
Routine Water					
pH	-	6.5 - 8.5	8.32	8.52	8.52
Conductivity (EC)	µS/cm	-	3300	2100	1800
Calcium	mg/L	-	35	7.4	4.7
Magnesium	mg/L	-	10	1.4	0.7
Sodium	mg/L	200	930	480	390
Potassium	mg/L	-	5.8	2.2	1.4
Iron	mg/L	0.3	<0.060	0.60	<0.060
Sulphate	mg/L	500	860	230	130
Chloride	mg/L	250	28	27	24
Bicarbonate	mg/L	-	1100	990	990
Carbonate	mg/L	-	2.6	16	18
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.010	<0.044
Nitrite (N)	mg/L	-	<0.010	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.010	<0.020	<0.010
TDS*	mg/L	500	2400	1200	1100
Hardness	mg/L	-	130	24	15
Alkalinity (total as CaCO3)	mg/L	-	870	840	840
Alkalinity (pp as CaCO3)	mg/L	-	2.2	13	15
Ionic Balance	N/A	-	1.2	0.96	7.7
Water Nutrients					
Ammonia-N	mg/L	-	1.3	0.89	0.79
TKN	mg/L	-	8.0	2.6	2.4
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	460	140	130
DOC	mg/L	-	39	33	25
Metals					
Aluminum	mg/L	0.1	0.0044	0.66	0.005
Antimony	mg/L	0.006	0.00076	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0089	0.0042	0.0018
Barium	mg/L	1	0.070	0.080	0.053
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.50	0.71	0.68
Cadmium	mg/L	0.005	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0032	0.0016	0.00057
Copper	mg/L	1	0.0017	0.028	<0.00020
Lead	mg/L	0.01	<0.00020	0.00094	<0.00020
Lithium	mg/L	-	0.20	0.089	0.07
Manganese	mg/L	0.05	0.13	0.058	0.027
Mercury	mg/L	0.001	<0.0000050	<0.0000060	<0.0000020
Molybdenum	mg/L	-	0.023	0.018	0.016
Nickel	mg/L	-	0.016	0.0083	0.0022
Phosphorus	mg/L	-	<0.10	0.17	<0.10
Selenium	mg/L	0.05	0.00058	<0.00020	<0.00020
Silicon	mg/L	-	3.5	3.9	3.3
Silver	mg/L	-	<0.00010	<0.00010	<0.0001
Strontium	mg/L	-	0.7	0.16	0.093
Sulphur	mg/L	-	360	64	35
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	0.0095	<0.0010
Uranium	mg/L	0.02	0.0096	0.0035	0.0012
Vanadium	mg/L	-	0.0015	0.0040	0.0014
Zinc	mg/L	5	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	14.643
Volume Purged (L)	25 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	2.113

Table E33B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 33B		
			May-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	7.5	7.48	-
Field EC	mS	-	5.18	5.34	-
Field Temperature	°C	-	6.0	6.9	-
Routine Water					
pH	-	6.5 - 8.5	7.89	8.15	7.99
Conductivity (EC)	µS/cm	-	5000	5400	5600
Calcium	mg/L	-	91	110	130
Magnesium	mg/L	-	26	38	42
Sodium	mg/L	200	1200	1300	1200
Potassium	mg/L	-	6.9	6.9	6.1
Iron	mg/L	0.3	<0.060	0.35	<0.6
Sulphate	mg/L	500	1900	2000	2100
Chloride	mg/L	250	21	20	21
Bicarbonate	mg/L	-	1000	1100	1200
Carbonate	mg/L	-	<0.50	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.050	0.68
Nitrite (N)	mg/L	-	<0.010	<0.050	0.2
Nitrate and Nitrate (N)	mg/L	-	<0.010	<0.020	0.21
TDS*	mg/L	500	3700	4000	4100
Hardness	mg/L	-	340	440	490
Alkalinity (total as CaCO3)	mg/L	-	850	920	1000
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	1.0	1.0	0.82
Water Nutrients					
Ammonia-N	mg/L	-	0.83	0.78	0.6
TKN	mg/L	-	5.3	2.6	2.7
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	280	140	150
DOC	mg/L	-	45	44	49
Metals					
Aluminum	mg/L	0.1	0.0056	0.060	0.0049
Antimony	mg/L	0.006	0.0013	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0065	0.0013	0.0014
Barium	mg/L	1	0.038	0.031	<0.10
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.23	0.28	0.25
Cadmium	mg/L	0.005	<0.000020	<0.000020	0.000044
Chromium	mg/L	0.05	<0.0010	0.0020	<0.0010
Cobalt	mg/L	-	0.0030	0.0020	0.0024
Copper	mg/L	1	0.00037	0.0027	0.0028
Lead	mg/L	0.01	<0.00020	0.00024	<0.00020
Lithium	mg/L	-	0.30	0.35	0.37
Manganese	mg/L	0.05	0.19	0.24	0.25
Mercury	mg/L	0.001	<0.0000050	0.00023	0.0000076
Molybdenum	mg/L	-	0.0070	0.00038	0.0008
Nickel	mg/L	-	0.015	0.0096	0.011
Phosphorus	mg/L	-	<0.10	<0.10	<1.0
Selenium	mg/L	0.05	0.00064	0.00038	0.00043
Silicon	mg/L	-	3.9	5.0	4.6
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	1.6	2.1	2.3
Sulphur	mg/L	-	610	720	690
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	0.0033	<0.0010
Uranium	mg/L	0.02	0.0021	0.00016	0.00026
Vanadium	mg/L	-	<0.0010	<0.0010	<0.0010
Zinc	mg/L	5	<0.0030	0.0056	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	5.447
Volume Purged (L)	1.4
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	1.398

Table E34A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-34A	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.66	6.9
Field EC	mS	-	3.02	2.46
Field Temperature	°C	-	8.1	6.2
Routine Water				
pH	-	6.5 - 8.5	8.57	8.43
Conductivity (EC)	µS/cm	-	3000	2500
Calcium	mg/L	-	19	12
Magnesium	mg/L	-	4.5	2.2
Sodium	mg/L	200	710	600
Potassium	mg/L	-	4.1	2.6
Iron	mg/L	0.3	0.13	0.31
Sulphate	mg/L	500	510	310
Chloride	mg/L	250	51	25
Bicarbonate	mg/L	-	1200	1200
Carbonate	mg/L	-	25	15
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.050	<0.044
Nitrite (N)	mg/L	-	<0.050	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.010
TDS*	mg/L	500	1900	1600
Hardness	mg/L	-	67	40
Alkalinity (total as CaCO3)	mg/L	-	990	1000
Alkalinity (pp as CaCO3)	mg/L	-	21	12
Ionic Balance	N/A	-	1.0	2.4
Water Nutrients				
Ammonia-N	mg/L	-	1.1	0.94
TKN	mg/L	-	2.6	1.8
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	470	190
DOC	mg/L	-	72	60
Metals				
Aluminum	mg/L	0.1	0.036	0.0049
Antimony	mg/L	0.006	0.00078	<0.00060
Arsenic	mg/L	0.01	0.0030	0.0028
Barium	mg/L	1	0.030	0.039
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.80	0.84
Cadmium	mg/L	0.005	<0.000020	<0.000020
Chromium	mg/L	0.05	0.0010	<0.0010
Cobalt	mg/L	-	0.0010	0.00054
Copper	mg/L	1	0.0019	<0.00020
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.14	0.13
Manganese	mg/L	0.05	0.14	0.13
Mercury	mg/L	0.001	0.000044	<0.0000020
Molybdenum	mg/L	-	0.042	0.012
Nickel	mg/L	-	0.0074	0.0039
Phosphorus	mg/L	-	<0.10	<0.10
Selenium	mg/L	0.05	0.00029	<0.0002
Silicon	mg/L	-	3.2	4.1
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.30	0.24
Sulphur	mg/L	-	170	100
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.018	0.005
Vanadium	mg/L	-	0.0023	0.0011
Zinc	mg/L	5	0.011	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	13.07
Volume Purged (L)	25 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	3.397

Table E34B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-34B	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	7.05	6.9
Field EC	mS	-	2.49	2.46
Field Temperature	°C	-	7.9	6.2
Routine Water				
pH	-	6.5 - 8.5	7.65	7.51
Conductivity (EC)	µS/cm	-	2400	2400
Calcium	mg/L	-	180	180
Magnesium	mg/L	-	55	60
Sodium	mg/L	200	320	320
Potassium	mg/L	-	11	9.7
Iron	mg/L	0.3	<0.060	<0.06
Sulphate	mg/L	500	510	470
Chloride	mg/L	250	39	39
Bicarbonate	mg/L	-	1000	1100
Carbonate	mg/L	-	<0.50	<0.5
Hydroxide	mg/L	-	<0.50	<0.5
Nitrate (N)	mg/L	10	0.014	<0.22
Nitrite (N)	mg/L	-	<0.010	<0.16
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.05
TDS*	mg/L	500	1600	1600
Hardness	mg/L	-	670	690
Alkalinity (total as CaCO3)	mg/L	-	840	890
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.5
Ionic Balance	N/A	-	0.96	1.6
Water Nutrients				
Ammonia-N	mg/L	-	0.16	0.069
TKN	mg/L	-	0.89	0.85
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.0004
Toluene	mg/L	0.024	<0.00040	<0.0004
Ethylbenzene	mg/L	0.0016	<0.00040	<0.0004
Xylene	mg/L	0.02	<0.00080	<0.0008
F1 (C6-C10)	mg/L	-	<0.10	<0.1
F2 (>C10-C16)	mg/L	-	<0.10	<0.1
Organics				
COD	mg/L	-	81	35
DOC	mg/L	-	14	13
Metals				
Aluminum	mg/L	0.1	0.0064	<0.003
Antimony	mg/L	0.006	<0.00060	<0.0006
Arsenic	mg/L	0.01	0.00054	0.00034
Barium	mg/L	1	0.054	0.052
Beryllium	mg/L	-	<0.0010	<0.001
Boron	mg/L	5	0.060	0.06
Cadmium	mg/L	0.005	0.00010	0.000056
Chromium	mg/L	0.05	<0.0010	<0.001
Cobalt	mg/L	-	0.0015	<0.0003
Copper	mg/L	1	0.0041	0.002
Lead	mg/L	0.01	<0.00020	<0.0002
Lithium	mg/L	-	0.12	0.12
Manganese	mg/L	0.05	0.11	0.053
Mercury	mg/L	0.001	0.0000025	<0.000002
Molybdenum	mg/L	-	0.0012	0.00054
Nickel	mg/L	-	0.0096	0.0057
Phosphorus	mg/L	-	0.26	<0.1
Selenium	mg/L	0.05	<0.00020	<0.0002
Silicon	mg/L	-	5.6	6.5
Silver	mg/L	-	<0.00010	<0.0001
Strontium	mg/L	-	1.2	1.2
Sulphur	mg/L	-	140	150
Thallium	mg/L	-	<0.00020	<0.0002
Tin	mg/L	-	<0.0010	<0.001
Titanium	mg/L	-	<0.0010	<0.001
Uranium	mg/L	0.02	0.0050	0.0034
Vanadium	mg/L	-	0.0031	<0.001
Zinc	mg/L	5	0.0073	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	5.855
Volume Purged (L)	9 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	2.729

Table E35-Deep: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35-DEEP	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.22	8.1
Field EC	mS	-	4.90	3.92
Field Temperature	°C	-	8.9	10
Routine Water				
pH	-	6.5 - 8.5	8.19	8.13
Conductivity (EC)	µS/cm	-	4700	5300
Calcium	mg/L	-	18	20
Magnesium	mg/L	-	2.1	2.1
Sodium	mg/L	200	970	1100
Potassium	mg/L	-	3.3	3.8
Iron	mg/L	0.3	<0.060	<0.060
Sulphate	mg/L	500	25	13
Chloride	mg/L	250	1100	1400
Bicarbonate	mg/L	-	560	500
Carbonate	mg/L	-	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	0.25	<0.22
Nitrite (N)	mg/L	-	<0.010	<0.16
Nitrate and Nitrate (N)	mg/L	-	0.25	<0.050
TDS*	mg/L	500	2400	2800
Hardness	mg/L	-	53	58
Alkalinity (total as CaCO3)	mg/L	-	460	410
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50
Ionic Balance	N/A	-	1.0	2.3
Water Nutrients				
Ammonia-N	mg/L	-	1.1	1.2
TKN	mg/L	-	2.2	2.5
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	110	130
DOC	mg/L	-	18	-
Metals				
Aluminum	mg/L	0.1	0.017	0.0031
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0018	0.00081
Barium	mg/L	1	0.27	0.41
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.69	0.75
Cadmium	mg/L	0.005	0.000040	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00069	0.00052
Copper	mg/L	1	0.00094	0.00048
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.15	0.19
Manganese	mg/L	0.05	0.048	0.053
Mercury	mg/L	0.001	0.0000020	<0.0000020
Molybdenum	mg/L	-	0.021	0.017
Nickel	mg/L	-	0.0038	0.0013
Phosphorus	mg/L	-	<0.10	<0.10
Selenium	mg/L	0.05	0.00020	<0.00020
Silicon	mg/L	-	3.5	3.6
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.36	0.5
Sulphur	mg/L	-	9.2	4.6
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	0.0013
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0023	0.00064
Vanadium	mg/L	-	<0.0010	<0.0010
Zinc	mg/L	5	<0.0030	0.16

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	33.4
Volume Purged (L)	162 (hydosleve)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	6.640

Table E35A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35A	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	n/a	n/a
Field EC	mS	-	n/a	n/a
Field Temperature	°C	-	n/a	n/a
Routine Water				
pH	-	6.5 - 8.5	8.60	8.61
Conductivity (EC)	µS/cm	-	1500	1600
Calcium	mg/L	-	3.8	3.6
Magnesium	mg/L	-	0.36	0.34
Sodium	mg/L	200	370	390
Potassium	mg/L	-	2.2	3.1
Iron	mg/L	0.3	0.11	<0.060
Sulphate	mg/L	500	41	21
Chloride	mg/L	250	36	36
Bicarbonate	mg/L	-	900	960
Carbonate	mg/L	-	26	23
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.044
Nitrite (N)	mg/L	-	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.010
TDS*	mg/L	500	930	950
Hardness	mg/L	-	11	10
Alkalinity (total as CaCO3)	mg/L	-	780	830
Alkalinity (pp as CaCO3)	mg/L	-	22	19
Ionic Balance	N/A	-	0.95	2.4
Water Nutrients				
Ammonia-N	mg/L	-	0.83	-
TKN	mg/L	-	12	-
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	0.00049
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.27	<0.27
Organics				
COD	mg/L	-	1100	-
DOC	mg/L	-	15	-
Metals				
Aluminum	mg/L	0.1	0.092	0.055
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0035	0.0023
Barium	mg/L	1	0.080	0.13
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.75	0.74
Cadmium	mg/L	0.005	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00042	0.00035
Copper	mg/L	1	0.0011	0.00065
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.068	0.069
Manganese	mg/L	0.05	0.012	0.013
Mercury	mg/L	0.001	<0.000020	<0.0000020
Molybdenum	mg/L	-	0.020	0.016
Nickel	mg/L	-	0.0053	0.0034
Phosphorus	mg/L	-	0.15	1.2
Selenium	mg/L	0.05	<0.00020	<0.00020
Silicon	mg/L	-	3.7	3.5
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.076	0.086
Sulphur	mg/L	-	11	5.9
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	0.0015	<0.0010
Uranium	mg/L	0.02	0.0013	0.00095
Vanadium	mg/L	-	0.0014	0.0012
Zinc	mg/L	5	0.0035	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	14.560
Volume Purged (L)	16 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	7.549

Table E35B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35B	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	7.83	7.8
Field EC	mS	-	8.08	7270
Field Temperature	°C	-	7.6	8
Routine Water				
pH	-	6.5 - 8.5	8.16	8.22
Conductivity (EC)	µS/cm	-	7700	7600
Calcium	mg/L	-	99	98
Magnesium	mg/L	-	14	14
Sodium	mg/L	200	1800	1800
Potassium	mg/L	-	7.8	8.6
Iron	mg/L	0.3	<0.60	<0.60
Sulphate	mg/L	500	3700	3300
Chloride	mg/L	250	5.2	6.8
Bicarbonate	mg/L	-	790	780
Carbonate	mg/L	-	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	0.42	2.5
Nitrite (N)	mg/L	-	<0.010	<0.16
Nitrate and Nitrate (N)	mg/L	-	0.42	-
TDS*	mg/L	500	6000	5700
Hardness	mg/L	-	300	300
Alkalinity (total as CaCO3)	mg/L	-	650	640
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50
Ionic Balance	N/A	-	0.95	2.3
Water Nutrients				
Ammonia-N	mg/L	-	1.9	2
TKN	mg/L	-	2.7	2.5
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	37	66
DOC	mg/L	-	8.2	12
Metals				
Aluminum	mg/L	0.1	0.012	0.0035
Antimony	mg/L	0.006	0.00069	<0.00060
Arsenic	mg/L	0.01	0.0019	0.0014
Barium	mg/L	1	<0.10	<0.1
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.70	0.71
Cadmium	mg/L	0.005	<0.000020	0.000022
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00065	0.00054
Copper	mg/L	1	0.0018	0.0032
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.50	0.52
Manganese	mg/L	0.05	0.066	0.074
Mercury	mg/L	0.001	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0055	0.0041
Nickel	mg/L	-	0.0041	0.0036
Phosphorus	mg/L	-	<1.0	<1.0
Selenium	mg/L	0.05	0.00082	0.00053
Silicon	mg/L	-	3.1	3.1
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	2.2	2.3
Sulphur	mg/L	-	1200	1200
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0023	0.0015
Vanadium	mg/L	-	<0.0010	<0.0010
Zinc	mg/L	5	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	7.985
Volume Purged (L)	13 (dry)
Sampling Date	1-Jun-17
Static Water Level (mbtoc)	4.445

Table E36-Deep: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-36-DEEP	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.52	8
Field EC	mS	-	3.83	4.84
Field Temperature	°C	-	7.7	10.3
Routine Water				
pH	-	6.5 - 8.5	8.51	8.33
Conductivity (EC)	µS/cm	-	3600	4800
Calcium	mg/L	-	17	18
Magnesium	mg/L	-	2.4	2.1
Sodium	mg/L	200	800	1100
Potassium	mg/L	-	5.4	3.9
Iron	mg/L	0.3	0.41	<0.060
Sulphate	mg/L	500	46	11
Chloride	mg/L	250	770	1100
Bicarbonate	mg/L	-	650	940
Carbonate	mg/L	-	13	3.1
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	0.018	<0.044
Nitrite (N)	mg/L	-	0.043	<0.033
Nitrate and Nitrate (N)	mg/L	-	0.061	<0.01
TDS*	mg/L	500	2000	2600
Hardness	mg/L	-	52	53
Alkalinity (total as CaCO3)	mg/L	-	550	770
Alkalinity (pp as CaCO3)	mg/L	-	11	2.6
Ionic Balance	N/A	-	1.1	2.3
Water Nutrients				
Ammonia-N	mg/L	-	0.92	1.3
TKN	mg/L	-	1.9	2.6
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	99	140
DOC	mg/L	-	12	-
Metals				
Aluminum	mg/L	0.1	0.19	0.0069
Antimony	mg/L	0.006	0.0030	<0.00060
Arsenic	mg/L	0.01	0.0088	0.0024
Barium	mg/L	1	0.23	0.32
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.71	0.97
Cadmium	mg/L	0.005	0.000070	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00082	0.0012
Copper	mg/L	1	0.011	0.0006
Lead	mg/L	0.01	0.00094	<0.00020
Lithium	mg/L	-	0.11	0.19
Manganese	mg/L	0.05	0.030	0.071
Mercury	mg/L	0.001	0.00019	<0.0000020
Molybdenum	mg/L	-	0.041	0.011
Nickel	mg/L	-	0.0086	0.0046
Phosphorus	mg/L	-	0.13	<0.10
Selenium	mg/L	0.05	0.00096	0.0003
Silicon	mg/L	-	2.6	3.6
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.34	0.46
Sulphur	mg/L	-	17	3.3
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	0.003
Titanium	mg/L	-	0.0030	<0.0010
Uranium	mg/L	0.02	0.0066	0.0016
Vanadium	mg/L	-	0.0078	<0.0010
Zinc	mg/L	5	0.0068	0.1

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	35.32
Volume Purged (L)	120 (hydrosleve)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	5.782

Table E36A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-36A	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.87	8.8
Field EC	mS	-	1.588	1.633
Field Temperature	°C	-	9.1	6.5
Routine Water				
pH	-	6.5 - 8.5	8.66	8.52
Conductivity (EC)	µS/cm	-	1600	1600
Calcium	mg/L	-	3.9	3.3
Magnesium	mg/L	-	0.41	0.32
Sodium	mg/L	200	390	380
Potassium	mg/L	-	1.4	1.3
Iron	mg/L	0.3	<0.060	<0.060
Sulphate	mg/L	500	<1.0	2.9
Chloride	mg/L	250	7.4	7.1
Bicarbonate	mg/L	-	970	1000
Carbonate	mg/L	-	25	18
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.044
Nitrite (N)	mg/L	-	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.010
TDS*	mg/L	500	900	930
Hardness	mg/L	-	12	9.5
Alkalinity (total as CaCO3)	mg/L	-	830	880
Alkalinity (pp as CaCO3)	mg/L	-	21	15
Ionic Balance	N/A	-	1.0	2.7
Water Nutrients				
Ammonia-N	mg/L	-	0.60	0.52
TKN	mg/L	-	1.3	1.2
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	55	42
DOC	mg/L	-	13	14
Metals				
Aluminum	mg/L	0.1	0.015	0.0093
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0012	0.00075
Barium	mg/L	1	0.031	0.034
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.82	0.79
Cadmium	mg/L	0.005	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00056	0.00043
Copper	mg/L	1	0.0026	<0.00020
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.064	0.067
Manganese	mg/L	0.05	0.022	0.032
Mercury	mg/L	0.001	0.000017	<0.0000020
Molybdenum	mg/L	-	0.010	0.0088
Nickel	mg/L	-	0.0019	0.00085
Phosphorus	mg/L	-	0.13	0.11
Selenium	mg/L	0.05	0.00023	<0.00020
Silicon	mg/L	-	3.4	3.5
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.045	0.046
Sulphur	mg/L	-	1.0	0.72
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.00037	0.00026
Vanadium	mg/L	-	0.0028	0.0021
Zinc	mg/L	5	0.0033	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

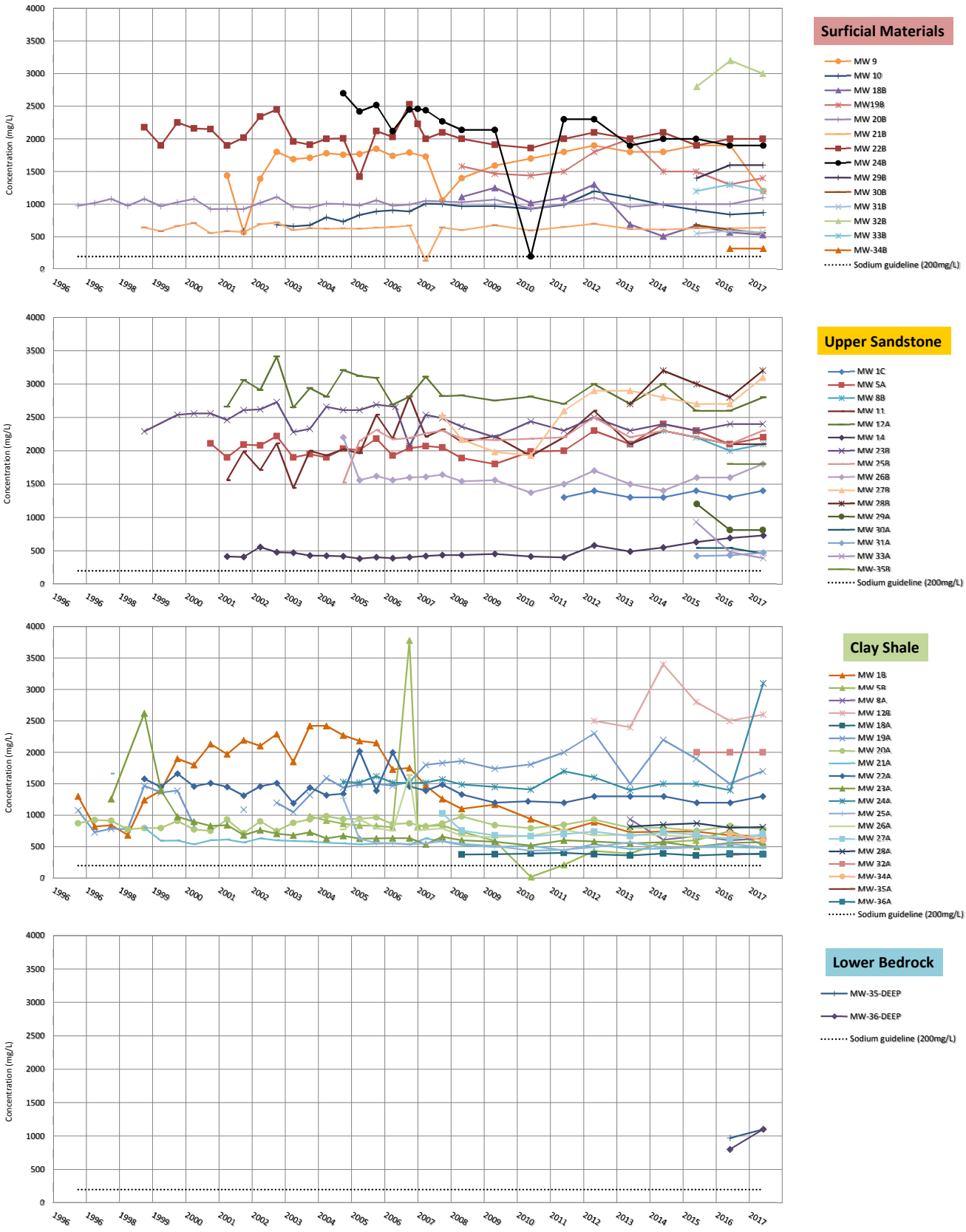
Field Data - June 2017

Date Well Purged	30-May-17
Total Depth Measured (mbtoc)	15.830
Volume Purged (L)	50 (dry)
Sampling Date	6-Jun-17
Static Water Level (mbtoc)	3.162

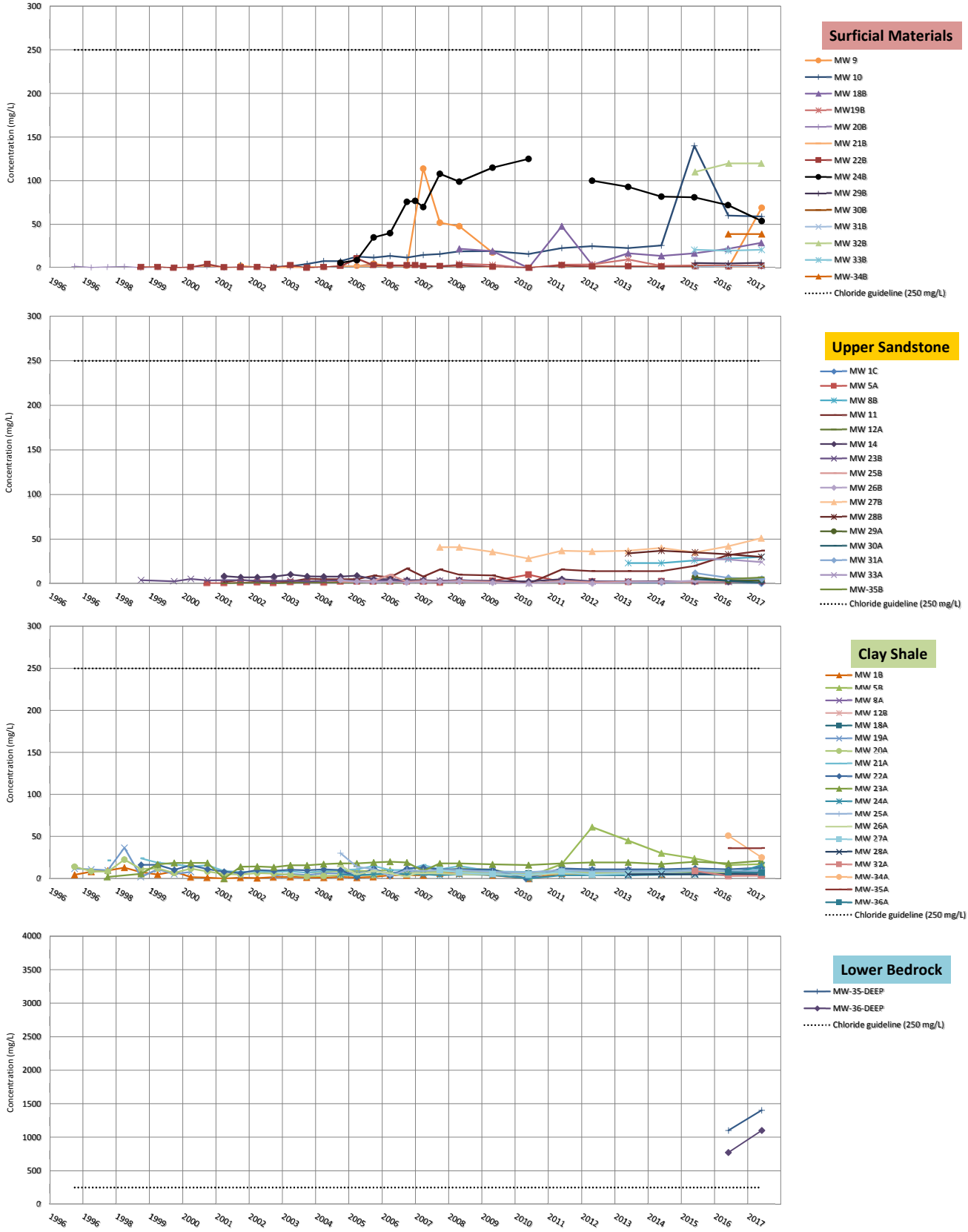
APPENDIX F

CONCENTRATION TRENDS

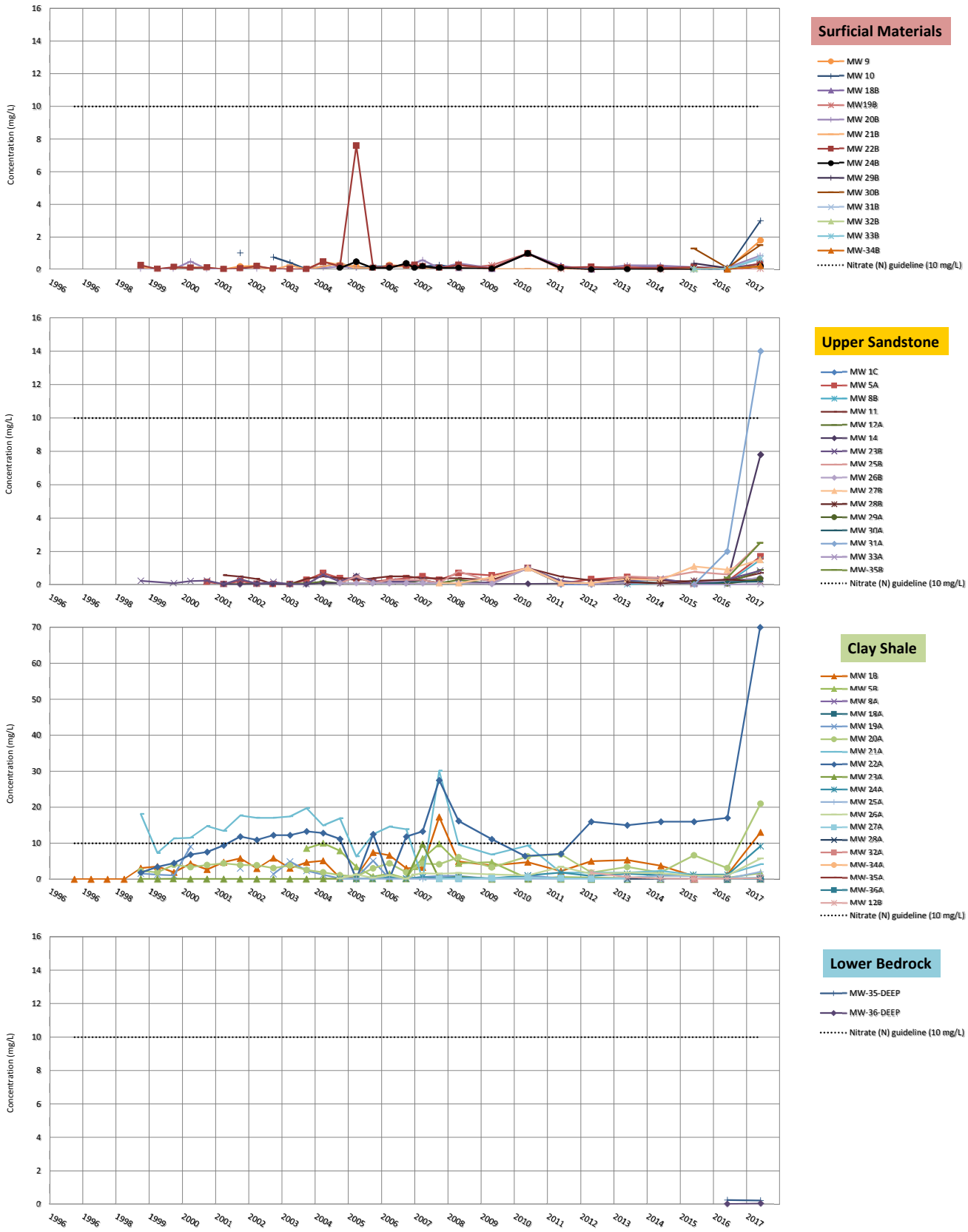
Appendix F1 - Sodium Concentration Trends



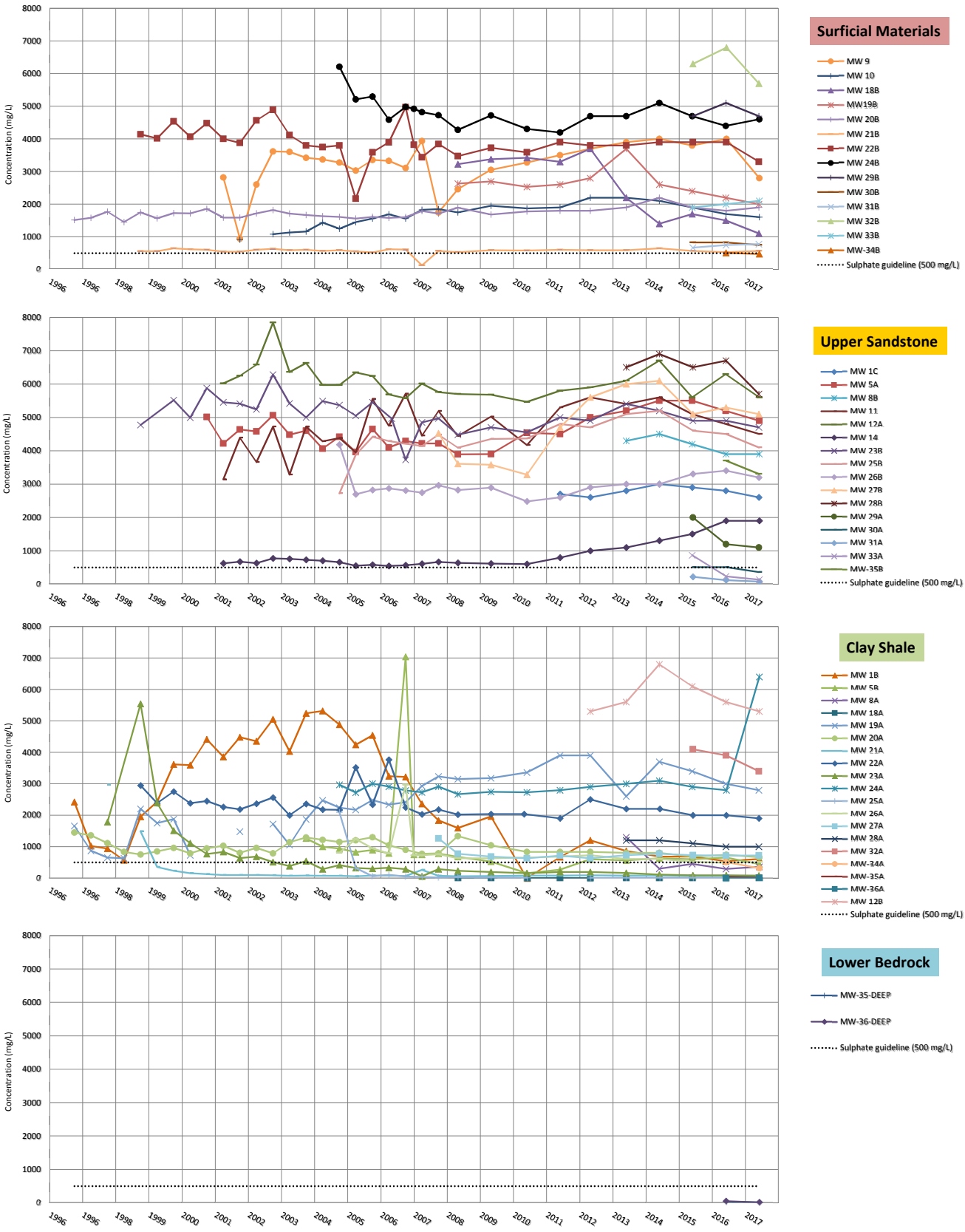
Appendix F2 - Chloride Concentration Trends



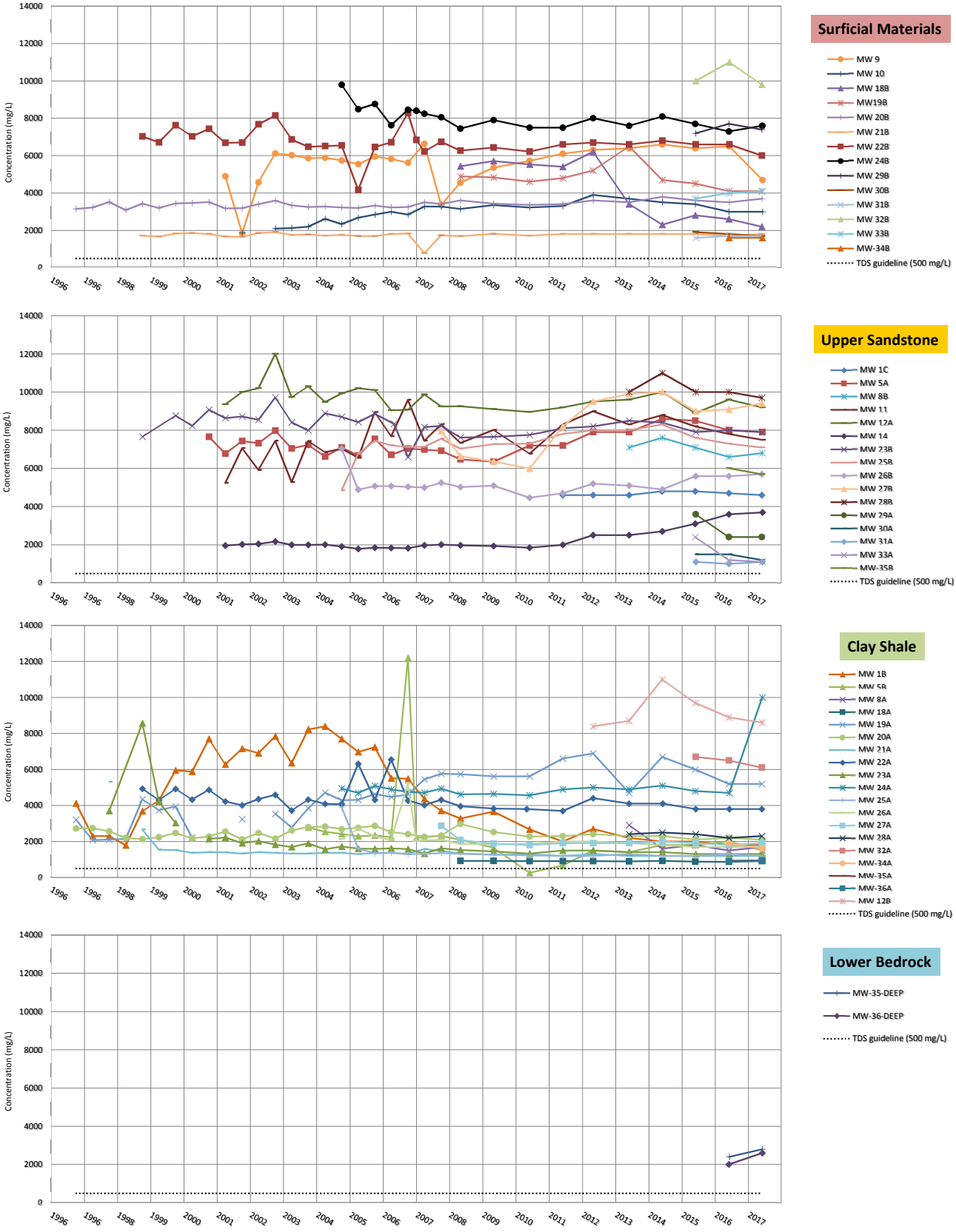
Appendix F3 - Nitrate Concentration Trends



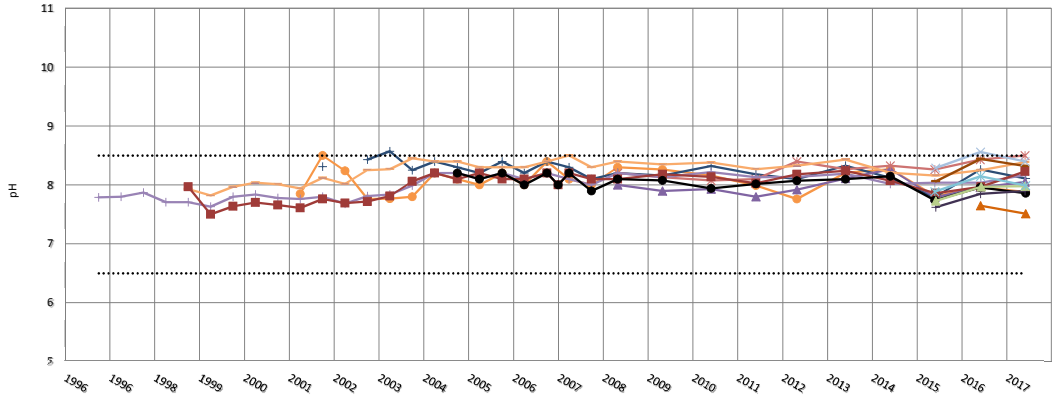
Appendix F4 - Sulphate Concentration Trends



Appendix F5 - TDS Concentration Trends

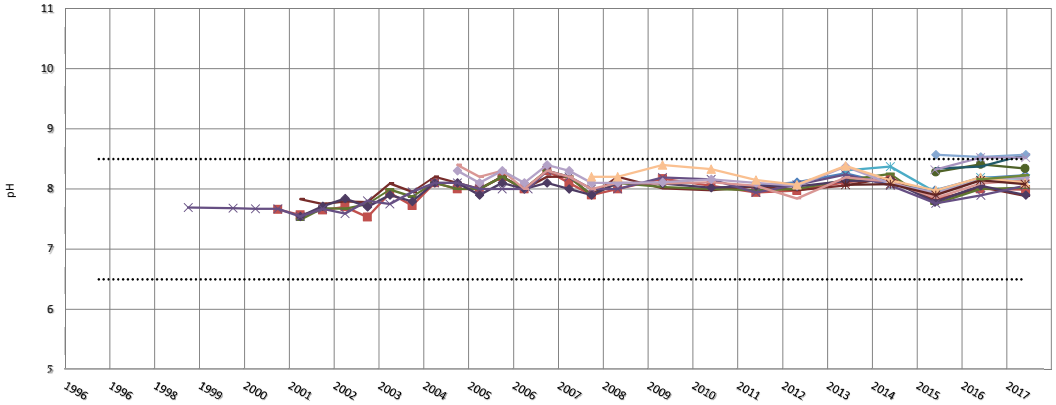


Appendix F6 - Lab pH Trends



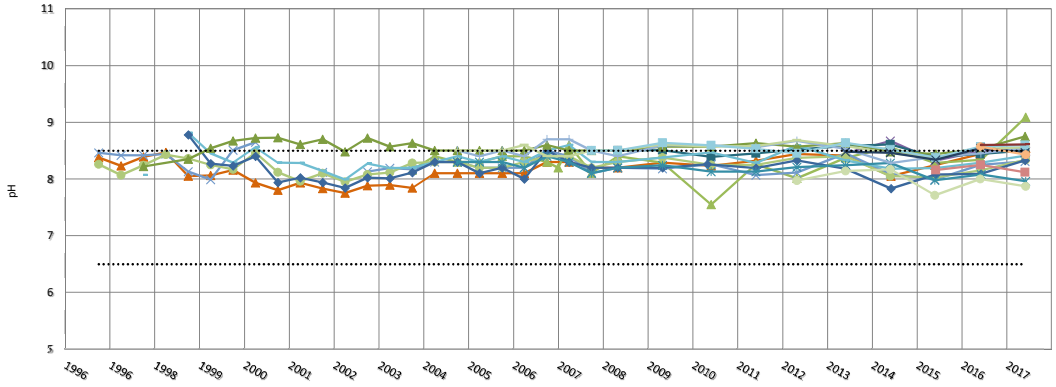
Surficial Materials

- MW 9
- MW 10
- MW 18B
- MW19B
- MW 20B
- MW 21B
- MW 22B
- MW 24B
- MW 29B
- MW 30B
- MW 31B
- MW 32B
- MW 33B
- MW-34B
- pH (Upper Limit 8.5)
- pH (Lower Limit 6.5)



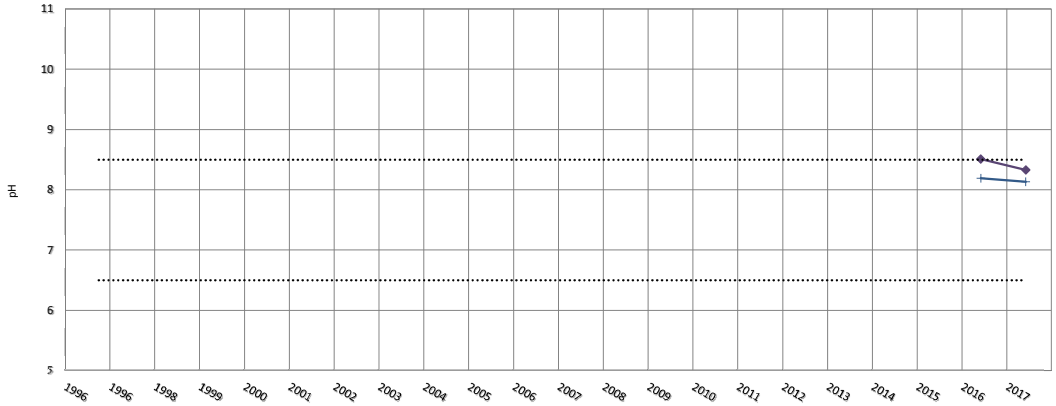
Upper Sandstone

- MW 1C
- MW 5A
- MW 8B
- MW 11
- MW 12A
- MW 14
- MW 23B
- MW 25B
- MW 26B
- MW 27B
- MW 28B
- MW 29A
- MW 30A
- MW 31A
- MW 33A
- MW-35B
- pH (Upper Limit 8.5)
- pH (Lower Limit 6.5)



Clay Shale

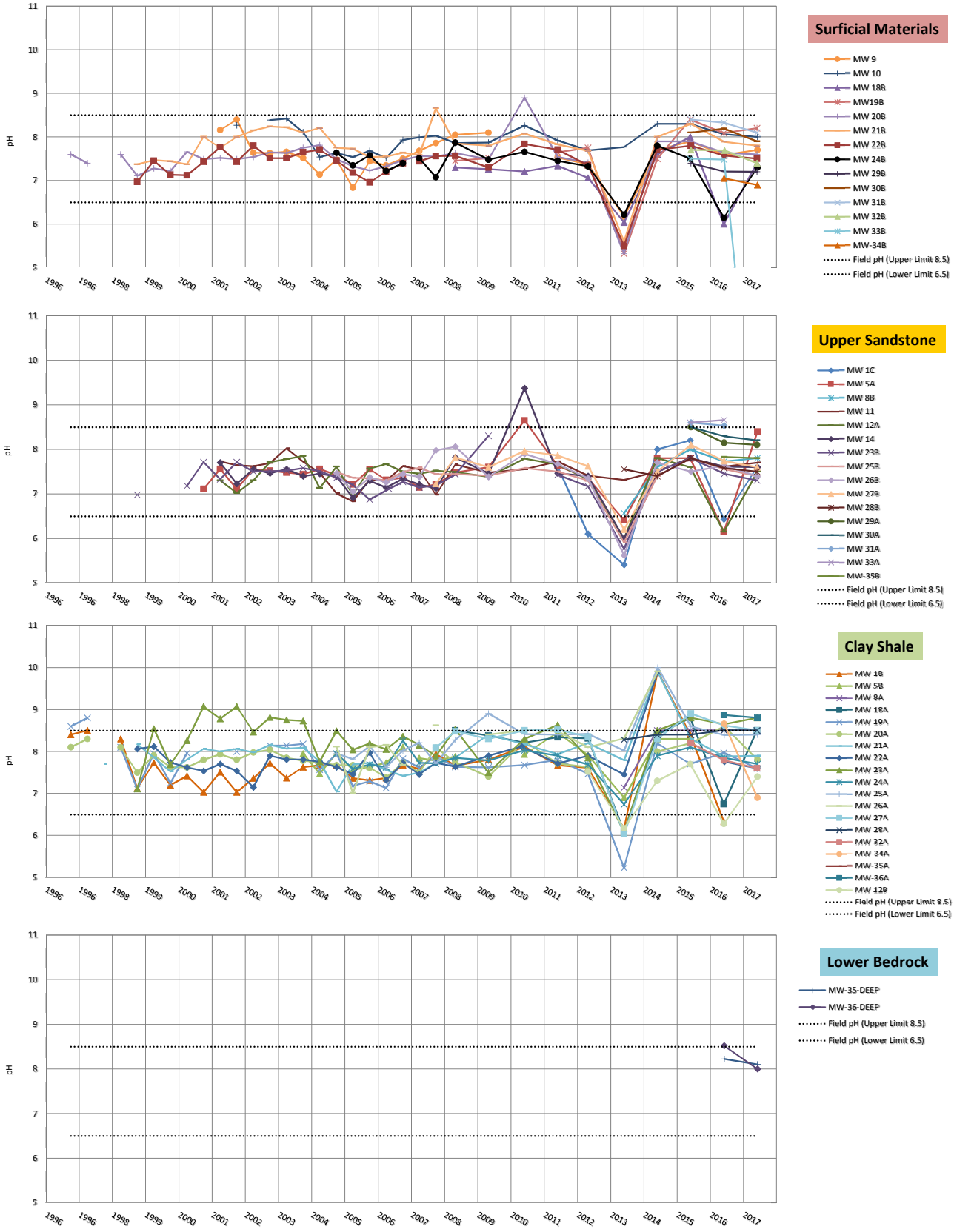
- MW 1B
- MW 5B
- MW 8A
- MW 18A
- MW 19A
- MW 20A
- MW 21A
- MW 22A
- MW 23A
- MW 24A
- MW 25A
- MW 26A
- MW 27A
- MW 28A
- MW 32A
- MW-34A
- MW-35A
- MW-36A
- MW 12B
- pH (Upper Limit 8.5)
- pH (Lower Limit 6.5)



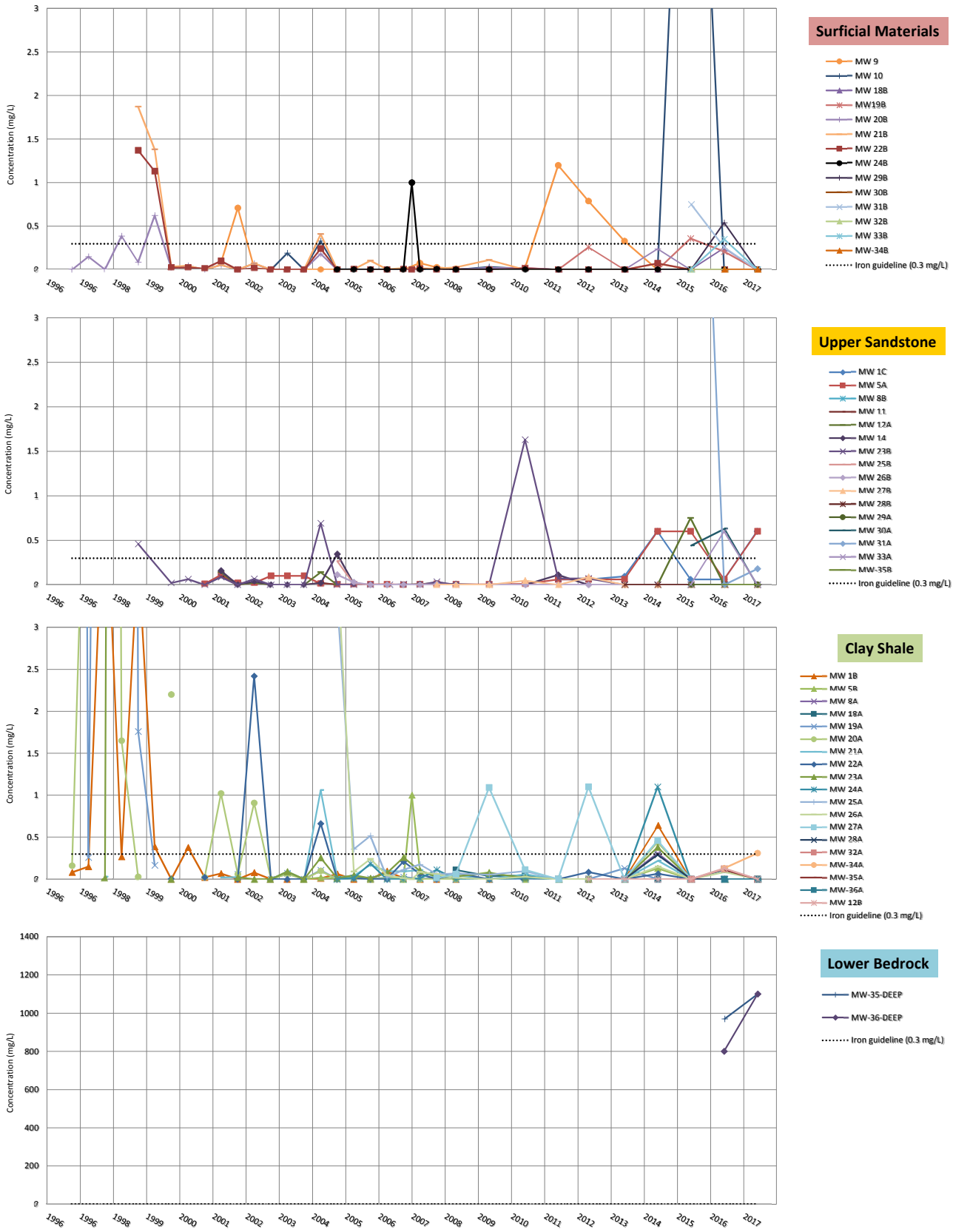
Lower Bedrock

- MW-35-DEEP
- MW-36-DEEP
- pH (Upper Limit 8.5)
- pH (Lower Limit 6.5)

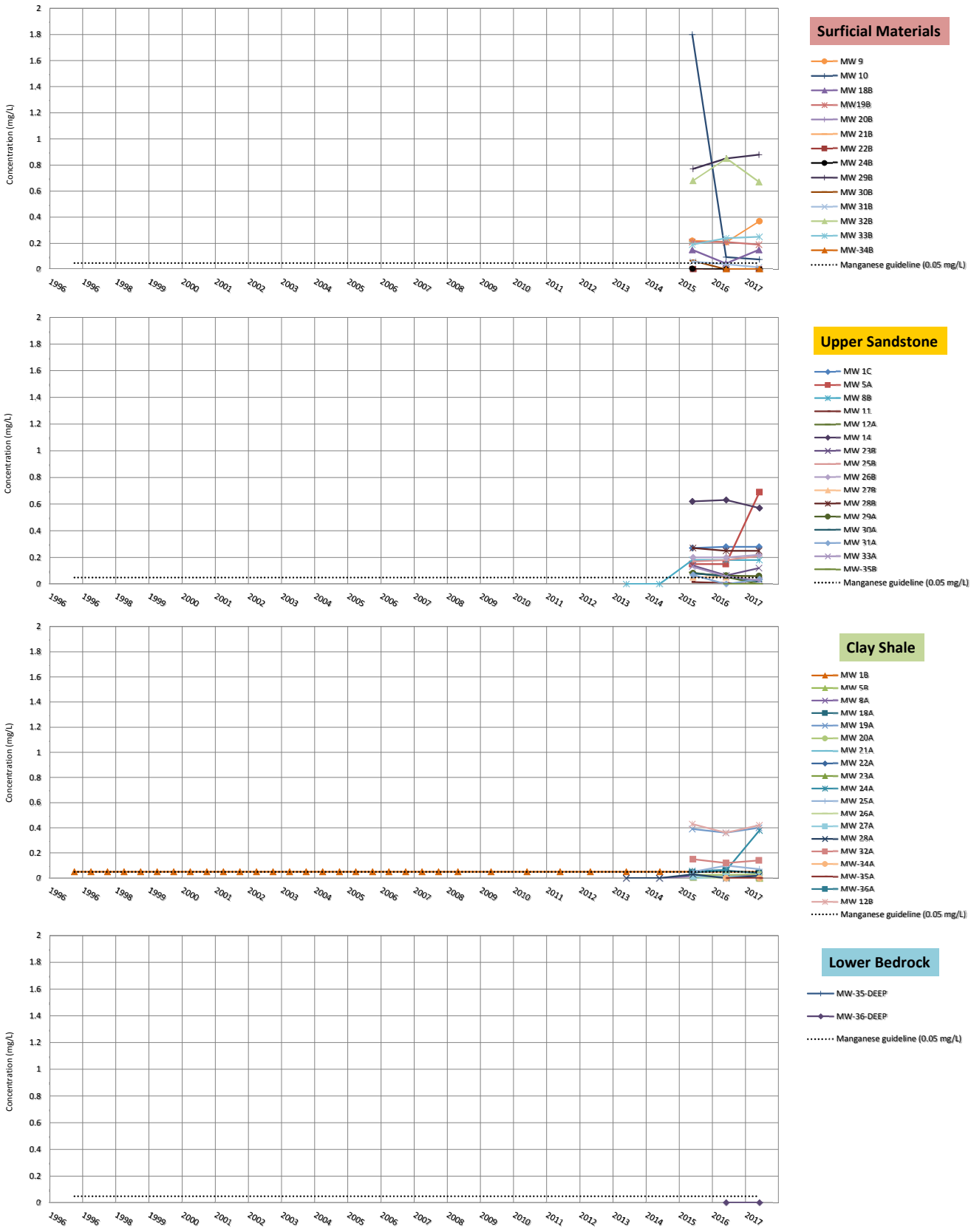
Appendix F7 - Field pH Trends



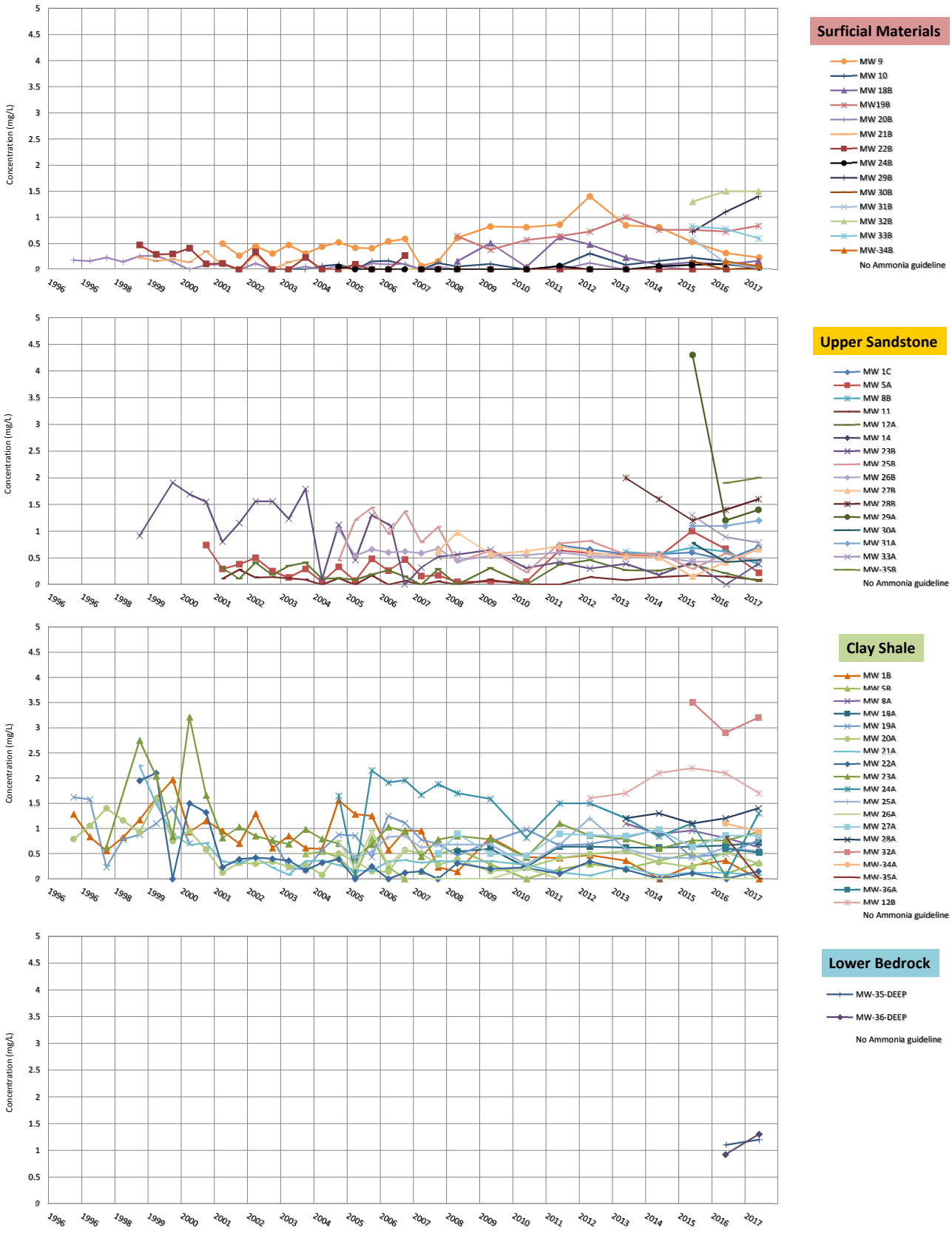
Appendix F8 - Iron Concentration Trends



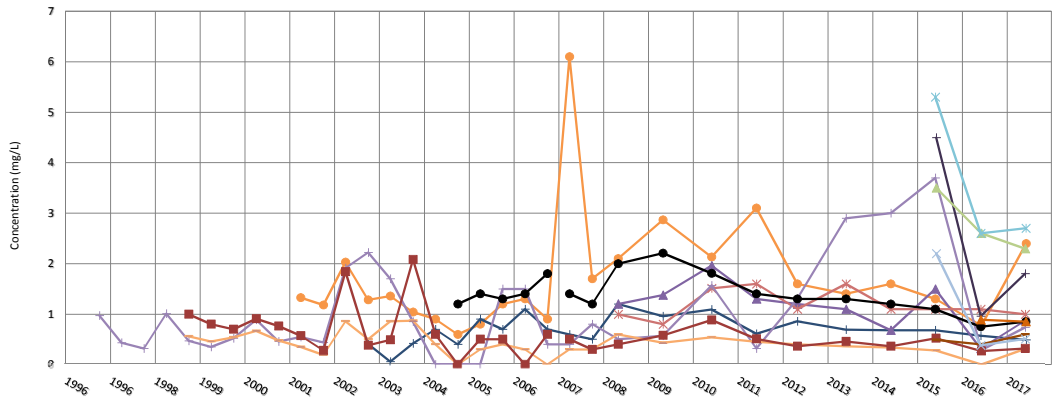
Appendix F9 - Manganese Concentration Trends



Appendix F10 - Ammonia Concentration Trends



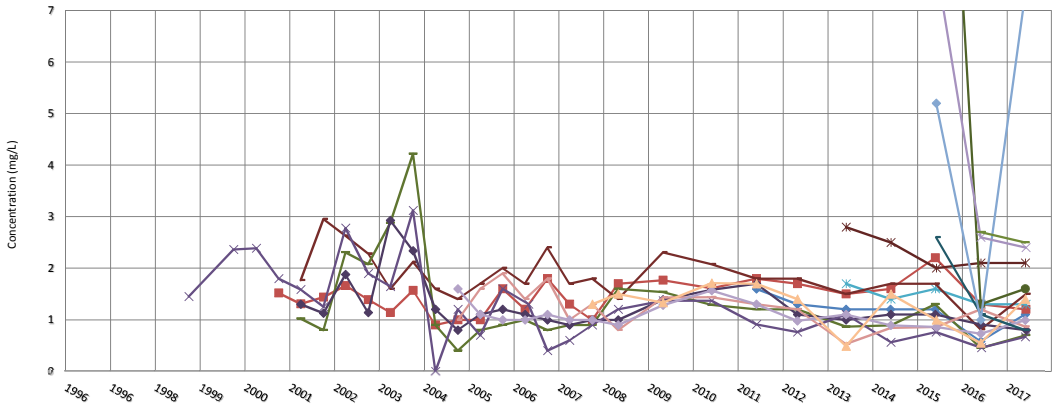
Appendix F11 - TKN Concentration Trends



Surficial Materials

- MW 9
- MW 10
- MW 18B
- MW19B
- MW 20B
- MW 21B
- MW 22B
- MW 24B
- MW 29B
- MW 30B
- MW 31B
- MW 32B
- MW 33B
- MW-34B

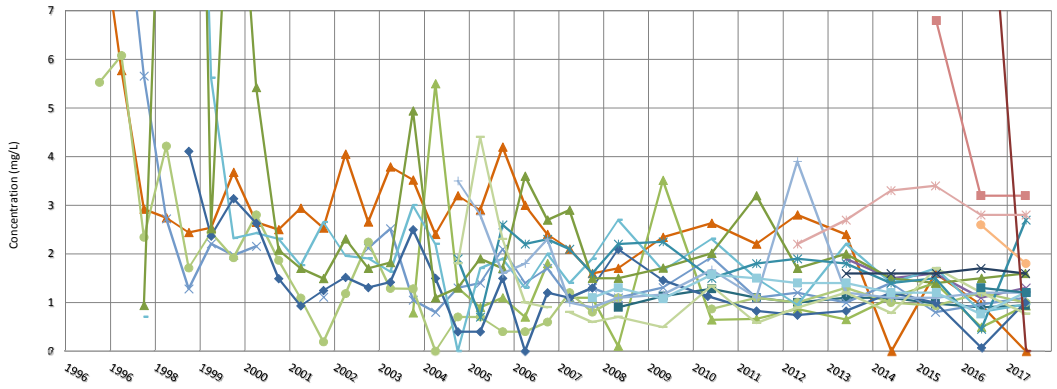
No TKN guideline



Upper Sandstone

- MW 1C
- MW 5A
- MW 8B
- MW 11
- MW 12A
- MW 14
- MW 23B
- MW 25B
- MW 26B
- MW 27B
- MW 28B
- MW 29A
- MW 30A
- MW 31A
- MW 33A
- MW-35B

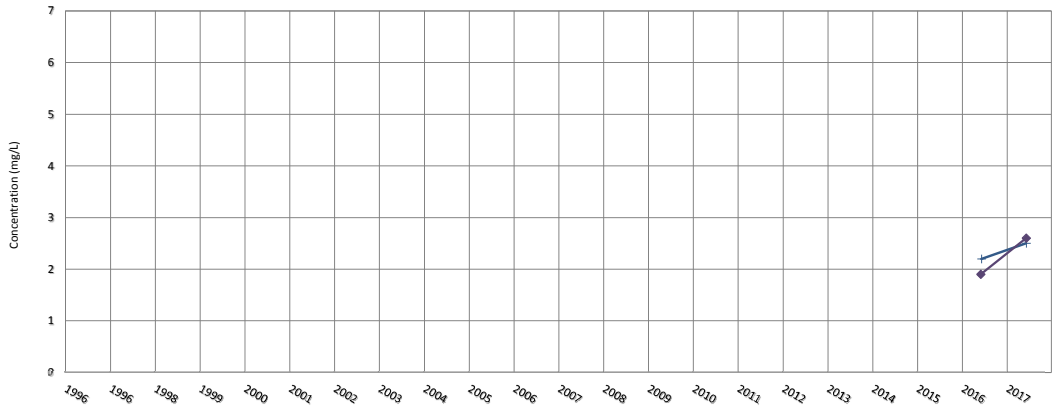
No TKN guideline



Clay Shale

- MW 1B
- MW 5B
- MW 8A
- MW 18A
- MW 19A
- MW 20A
- MW 21A
- MW 22A
- MW 23A
- MW 24A
- MW 25A
- MW 26A
- MW 27A
- MW 28A
- MW 32A
- MW-34A
- MW-35A
- MW-36A
- MW 12B

No TKN guideline



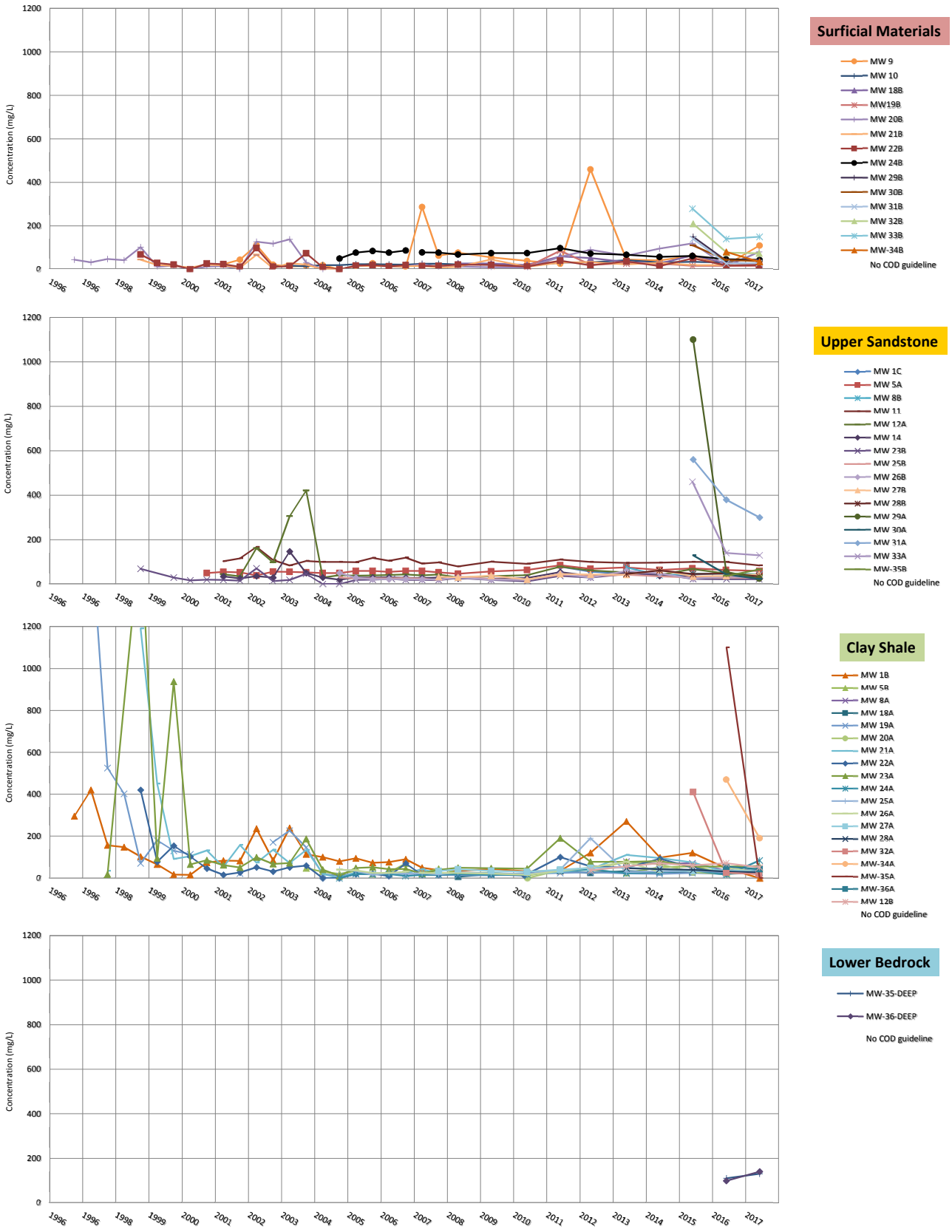
Lower Bedrock

- MW-35-DEEP
- MW-36-DEEP

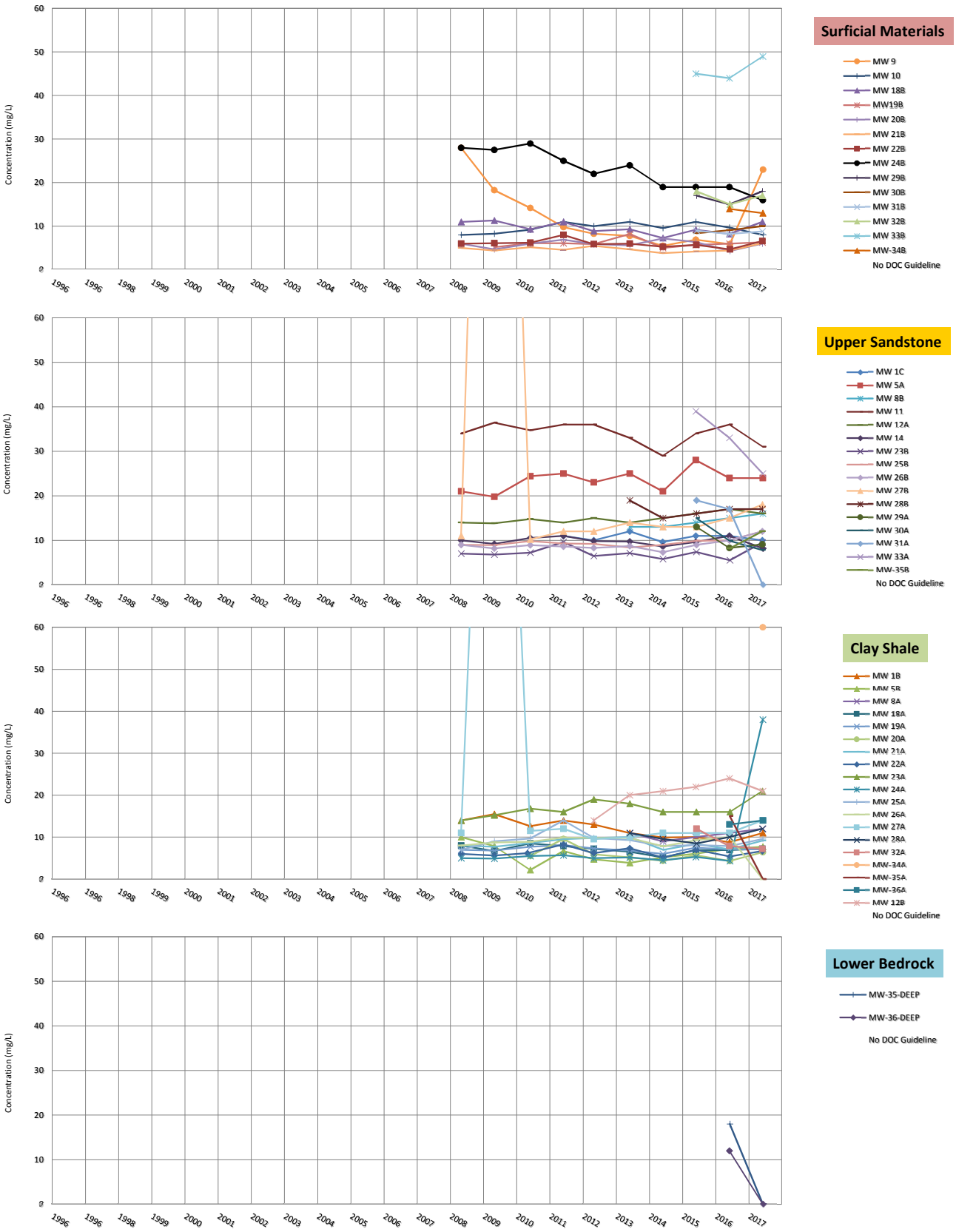
No TKN guideline

TETRA TECH

Appendix F12 - COD Concentration Trends



Appendix F13 - DOC Concentration Trends



APPENDIX G

RECORD OF SITE CONDITION

Record of Site Condition

1 REPORT AND FORM INFORMATION

Title of report	Groundwater Monitoring Program – 2017 Class I Waste Management Facility, Ryley, Alberta		
Report date (*dd-mon-yyyy*)	10-11-2017	Record of Site Condition (RSC) ID No.Ψ	

2 SITE IDENTIFICATION AND PHYSICAL LOCATION

2.1 Site name	Clean Harbors, Ryley Facility		
2.2 Address of site	2 km No. of Hwy.14 on Secondary Rd.854, Ryley, AB T0B 4A0		
	Municipality	Beaver County	**Alberta**

2.3 Legal land description of site *(if multiple, list all.)*

Plan, Block, Lot (PBL)			Alberta Township System (ATS)					
Plan	Block	Lot	LSD	Quarter	Section	Township	Range	Meridian
				SE	9	50	17	4

3 STAKEHOLDERS

3.1 Operator

Company	Clean Harbors Inc.	Contact person	Mr. Stan Yuha
Mailing address	P.O. Box 390 Ryley, AB T0B 4A0	Position held	Facility Manager
		Business phone No.	780.717.9606
		Business fax No.	
		Business e-mail	Yuha.Stan@cleanharbors.com

3.2 Consultant ☐ Not applicable

Company	Tetra Tech Canada Inc.	Contact person	Michele Crawford
Mailing address	**14940 123 Ave NW** **Edmonton, AB T5V 1B4**	Position held	Project Manager
		Business phone No.	780.451.2121
		Business fax No.	
		Business e-mail	Michele.Crawford@tetratech.com

3.3 Landowner(s)

Land type	☒ Private ☐ Special Areas ☐ Parks and protected area ☐ Public (*if not private, provide Disposition No.: _____)*
Landowner(s)	☒ Same as operator ☐ Other

Ψ: Do not fill in. Reserved for internal administrative purposes only.

3.4 Occupant(s)			
Are there occupants at the site?	☒ Yes	☐ No	☐ To be determined (TBD)
Occupant(s)	☒ Same as operator	☐ Same as landowner	☐ Other
What is the type of occupancy?	☐ Apartment building	☐ Town house	☐ Single detached house
	☐ Agricultural	☒ Industrial	☐ Commercial
	☐ Other (*specify*) Waste Management Facility		

4 OPERATING STATUS

☒ Operating ☐ Suspended ☐ Abandoned ☐ Decommissioning in progress ☐ Closed
☐ Reclaimed (*provide Reclamation Certificate No.(s):* _____) ☐ Not applicable

5 TYPE OF ACTIVITY AND SITE

5.1 Petroleum Storage Tank Site ☐ Yes

5.1.1 ESRD file No.(s)		PTMAA site No.	

5.1.2 Types of activity

☐	Retail gas station	☐	Aviation fuelling station	☐	Bulk fuel	☐	Other *(specify)*: _____

5.2 Upstream Oil and Gas Facility ☐ Yes

5.2.1 ESRD file No.(s)		AER approval No.(s)	

5.2.2 AER authorization type ☐ Approval ☐ License ☐ Permit ☐ Order ☐ Other (*specify*)_____

5.2.3 Types of activity

☐	Wellsite and associated facility	☐	Satellite	☐	Battery	☐	Pipeline
☐	Compressor and pumping station	☐	Other (*specify*): _____				

5.3 Approved Facility Under Environmental Protection and Enhancement Act (EPEA) ☒ Yes

5.3.1 ESRD approval No.(s)	10348-03-00	AER approval No.(s)	

5.3.2 Types of approved activity

☐	Chemical manufacturing plant	☐	Enhanced recovery in-situ oil sands or heavy oil processing plant	☐	Fertilizer manufacturing plant	☐	Landfill
☐	Metal manufacturing plant	☐	Oil refinery	☐	Oilsands processing plant	☐	Oil production site
☐	Pesticide manufacturing plant	☐	Petrochemical manufacturing plant	☐	Pipeline	☐	Power plant
☐	Pulp and paper processing plant	☐	Sour gas processing plant	☐	Sulphur manufacturing or processing plant	☒	Waste management facility
☐	Wood treatment plant	☐	Other *(specify):* _____				

5.4 Facility Under EPEA Code of Practice	☐ Yes						
5.4.1 ESRD registration No.(s)		**AER registration No.(s)**					
5.4.2 Type of Code of Practice							
☐	Asphalt paving plant	☐	Compressor and pumping station	☐	Concrete producing plant	☐	Landfill
☐	Pesticides	☐	Pipeline	☐	Land treatment of soils containing hydrocarbons	☐	Sand and gravel pit
☐	Small incinerator	☐	Sweet gas processing plant	☐	Other *(specify)*: _____		

5.5 Other Activity	☐ Yes				
5.5.1 ESRD file No.(s)		Other site ID No.(s)		Authorized by	
5.5.2 Types of activity					
☐	Dry cleaning operation	☐	Highway maintenance yard	☐	Transportation
☐	Other *(specify)*: _____				

6 SITE CHARACTERIZATION

6.1 What Environmental Site Assessments (ESA) Have Been Conducted and Completed to Date?

☐ Phase I ESA

☐ Phase II ESA (*check all that apply.*)

☐ Initial intrusive sampling ☐ delineation completed ☐ post-remediation monitoring ☐ final confirmatory sampling

6.2 Contaminants of Potential Concern (COPC)

6.2.1 Does the site have any of the conditions that require the mandatory use of *Alberta Tier 2 Soil and Groundwater Remediation Guidelines* (ESRD, 2007 and updates)? *(check all that apply in Section 6.2.1.1.)*

☐ Yes ☒ No *(➔proceed to Section 6.2.2.)*

6.2.1.1 Identify any conditions that require the approaches of the Alberta Tier 2 guidelines. *(see Alberta Tier I Soil and Groundwater Remediation Guidelines (ESRD, 2007 and updates), for details.)*

☐	Contamination within 30 cm of building foundation	☐	Unusual building feature (*eg. earthen floor*)	☐	Contamination within 10 m distance of surface water body
☐	Fractured bedrock	☐	Potentially high hydraulic conductivity *(> 10^{-5} m/sec.)*	☐	Other (*see Alberta Tier 1 guidelines and specify):* _____

6.2.1.2 Did the Alberta Tier 2 approach lead to a soil or groundwater guideline that was lower than the corresponding Tier 1 guideline for the same contaminant(s)?

☐ Yes ☐ TBD ☐ No *(➔proceed to Section 6.2.2.)*

6.2.1.3 If you answered 'yes' or 'TBD' to Section 6.2.1.2, identify the group of contaminants for each COPC with a mandatory Tier 2 guideline that is lower than the corresponding Tier 1 guideline (*check all that apply*, *see Alberta Tier 1 guidelines, Tables 1-4 for detailed listing).*

☐	General and inorganic parameters	☐	Metals
☐	Hydrocarbons	☐	Halogenated aliphatics
☐	Chlorinated aromatics	☐	Pesticides
☐	Other organics	☐	Radionuclides
☐	Salt	☐	Other (*specify*): _____

6.2.1.4 Did any past or current ESA relevant to this investigation identify an exceedance of the mandatory Tier 2 guidelines referred to in Section 6.2.1.3 (e.g. Tier 2 guidelines that are lower than the corresponding Tier 1 guidelines)? ☐ Yes ☐ No ☐ TBD

6.2.1.5 If you answered 'yes' in Section 6.2.1.4, have all relevant COPC been remediated to meet the mandatory Tier 2 guidelines? ☐ Yes ☐ No

6.2.2. Did any past or current ESA relevant to this investigation identify a drilling waste disposal area?

☐ Yes ☒ No *(➔proceed to Section 6.2.3.)*

6.2.2.1 If a drilling waste disposal area was identified, did any past or current ESA identify non-compliance with the compliance options outlined in *Assessing Drilling Waste Disposal Areas: Compliance Options for Reclamation Certification* (AER, 2014), as amended?

☐ Yes ☐ No

6.2.2.2 If you answered 'yes' in Section 6.2.2.1, have all COPC been remediated to meet the compliance options outlined in *Assessing Drilling Waste Disposal Areas: Compliance Options for Reclamation Certification* (AER, 2014), as amended?

☐ Yes ☐ No

6.2.2.3 For any COPC that did not meet the compliance options in Assessing Drilling Waste Disposal Areas, identify the group of contaminants (*check of all that apply*, *see the Alberta Tier 1 guidelines, Tables 1-4 for detailed listing).*

☐	General and inorganic parameters	☐	Metals
☐	Hydrocarbons	☐	Halogenated aliphatics
☐	Chlorinated aromatics	☐	Pesticides
☐	Other organics	☐	Radionuclides
☐	Salt	☐	Other (*specify*): _____

6.2.3 For all areas and COPCs not assessed under Sections 6.2.1 or 6.2.2, did any ESA relevant to this investigation identify an exceedance over the Alberta Tier 1 guidelines?

☐ Yes ☒ No *(➔proceed to Section 6.3.)*

6.2.3.1 If you answered 'yes' in Section 6.2.3, have all COPC been remediated to meet the Alberta Tier 1 guidelines?

☐ Yes ☐ No ☐ TBD

6.2.3.2 For any COPC that exceeded Alberta Tier 1 guidelines in Section 6.2.3.1, identify the group of contaminants. (*check all that apply*, *see the Alberta Tier 1 guidelines, Tables 1-4 for detailed listing.)*

☐	General and inorganic parameters	☐	Metals
☐	Hydrocarbons	☐	Halogenated aliphatics
☐	Chlorinated aromatics	☐	Pesticides
☐	Other organics	☐	Radionuclides
☐	Salt	☐	Other (*specify*): _____

6.3 Status of Investigation

6.3.1 Identify soil and groundwater guidelines used to assess the COPCs that are the subject of this investigation *(check all that apply).*

☐ *Alberta Tier 1 Soil and Groundwater Remediation Guidelines* – 2007 and updates,
☐ Coarse grained ☐ Fine grained

☐ *Alberta Tier 2 Soil and Groundwater Remediation Guidelines* – 2007 and updates,
☐ Pathway exclusion ☐ Guideline adjustment ☐ Site specific remediation objectives

☐ *Assessing Drilling Waste Disposal Areas: Compliance Options for Reclamation Certification* (AER, 2014), as amended

☒ Other (*specify*): Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

6.3.2 What land use classification(s) is used?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify:* Drinking Water Quality)

6.3.3 What is the outcome of the investigation? *(check one only.)*

☐ For all COPCs on-site and off-site, no exceedance has been found above any applicable soil and groundwater guidelines in any prior and current assessments.

☐ All contamination on-site and off-site has been completely remediated and meets the applicable soil and groundwater guidelines.

☒ One or more COPC still exceeds the applicable soil or groundwater guidelines.

6.3.4 How many contaminated areas are there currently at the site?

_____ ☐ None ☒ TBD

6.3.5 Are all contaminated areas and potential contaminated areas assessed during this investigation?

☐ Yes ☐ No

6.3.6 For all areas of potential environmental concern, list the dates when the contamination was discovered *(specify dd-mon-yyyy)***:** _____; _____

6.3.7 For all areas that have been identified in Section 6.3.4, have all substance releases been reported to ESRD?

☐ Yes ☐ No ☒ Not applicable

6.3.8 If the answer to Section 6.3.7 is 'yes', list all Incident No.(s) (*attach separate sheet if necessary*):

_____; _____ ☐ Not assigned

6.3.9 What is the approximate, cumulative amount of land area remaining exceeding applicable remediation guidelines? _____ (m^2) ☐ None ☒ TBD

6.3.10 Is there non-aqueous phase liquid (NAPL) product remaining on site? ☐ Yes ☒ No ☐ TBD

6.3.11 Is there non-aqueous phase liquid (NAPL) product remaining off site? ☐ Yes ☒ No ☐ TBD

6.3.12 What is the remediation status of the contaminated areas at site?

☒	No remediation required	☐	Site has exceedance but no remediation plan
☐	Remediation plan developed	☐	Active remediation
☐	Remediation completed	☐	Post remediation assessment completed
☐	Ongoing risk management plan – on-site	☐	Ongoing risk management plan – off-site
☐	Remediation Certificate issued for some area(s) *(provide Remediation Certificate No.(s):_____)*		
☐	Remediation Certificate cancelled for some area(s) *(provide Remediation Certificate No.(s):_____)*		

Direction for Completing the Remainder of the Form

Attach the analytical summary tables of the COPCs that are the subject of this investigation and still present at this site. A detailed listing of COPCs can be found with Tables 1-4 in *Alberta Tier 1 Soil and Groundwater Remediation Guidelines* (ESRD, 2007 and updates), as amended. Refer to the *RSC User's Guide* for detailed information on format and other requirements regarding the summary table.

For the remainder of the form, follow the directions below:

- If the COPCs on-site and off-site have never exceeded any applicable soil and groundwater guidelines in any prior and current assessments, ➔proceed to Section 8, or
- If the COPCs on-site and off-site have been completely remediated and meet the applicable soil and groundwater guidelines, ➔proceed to Section 8, or
- For all other circumstances, continue with Section 6.4.

6.4 Key Transport Factors for Existing COPCs

6.4.1 What is the horizontal distance to the nearest water well from the edge of the nearest contaminated area?

☐ 0-50 m ☐ 50-100 m ☐ 100-300 m ☐ 300-1000 m ☐ > 1000 m

6.4.2 What is the horizontal distance to the nearest surface water body from the edge of the contaminated area?

☐ ≤10 m ☐ 10-50 m ☐ 50-100 m ☐ 100-300 m ☐ 300-1000 m ☐ > 1000 m

6.4.3 Does delineation achieve closure above the groundwater water table that is nearest to the ground surface?

☐ Yes *(➔ go to Section 6.5.)* ☐ No ☐ TBD

6.4.4 Is the groundwater that is nearest the ground surface a domestic use aquifer (DUA) as defined in Alberta Tier 2 guidelines?

☐ Yes ☐ No ☐ TBD ☐ Not required (NR)

6.4.5 Is there a hydraulic barrier, as defined in Alberta Tier 2 guidelines, between the base of the contaminated area and the DUA?

☐ Yes ☐ No ☐ TBD ☐ NR

6.4.6 If you answered 'yes' to Section 6.4.5, provide the measured largest value of the hydraulic conductivity (as value ×10^{-7} m/sec.) for the 5.0 m vertical layer from the bottom of the contaminated zone.

_____(×10^{-7} m/sec.) ☐ TBD ☐ NR

6.5 On-site Characterization

6.5.1 What is the dominant soil texture that governs substance transport at the site?

☐ Coarse grained ☐ Fine grained ☐ TBD ☐ Not applicable (*must identify reason in Section 6.2.1.1.)*

6.5.2 What are the shallowest and deepest measured depths (meters below ground surface) of the water table at site?

Shallowest: _____ (m) Deepest: _____(m) ☐ TBD ☐ NR (*specify max. depth assessed*: _____(m))

6.5.3 What is the dominant horizontal direction of groundwater flow for the near surface water table?

(*N, NW, etc.:* _____) ☐ TBD ☐ NR

6.5.4 What is the existing land use classification?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify*) _____

6.5.5 What is the end land use classification?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify*) _____

6.5.6 Identify exposure pathways for which the applicable guidelines are exceeded on-site *(check all that apply).*			
☐	Vapour inhalation	☐	Soil ingestion
☐	Ingestion of potable water	☐	Soil dermal (skin) contact
☐	Fresh water aquatic life	☐	Soil contact for plants and invertebrates
☐	TBD	☐	Other *(specify)*: _____

6.6 Off-site Characterization

6.6.1 Are there COPCs off-site exceeding applicable soil or groundwater guidelines?

☐ No *(➔if on-site contamination was reported, proceed to Section 7, otherwise, proceed to Section 8.)*
☐ Yes ☐ TBD

6.6.2 What is the current land use classification for any off-site area(s) identified in Section 6.6.1?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify*) _____

6.6.3 What is the end land use classification for any off-site area(s) identified in Section 6.6.1?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify*) _____

6.6.4 Is there any substance concentration under a road allowance exceeding the applicable soil or groundwater guidelines?

☐ Yes ☐ No (➔*proceed to Section 6.6.6.)* ☐ TBD

6.6.5 What is the most sensitive land use classification adjacent to the road allowance?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify*) _____

6.6.6 Identify exposure pathways for which the applicable guidelines are exceeded off-site *(check all that apply).*			
☐	Vapour inhalation	☐	Soil ingestion
☐	Ingestion of potable water	☐	Soil dermal (skin) contact
☐	Fresh water aquatic life	☐	Soil contact for plants and invertebrates
☐	TBD	☐	Other *(specify)*: _____

7 RISK MANAGEMENT PLAN (RMP)

7.1 What is the Plan for Contaminated Areas Still Remaining on and off the Site? *(check one only.)*

- ☐ Complete remediation *(➔proceed to Section 8).*
- ☐ Partial remediation with risk management for some residual contamination.
- ☐ Risk management for all remaining contamination.

7.2 Key Progress of RMP

7.2.1 If the site needs an on-going RMP, answer all the following questions that apply to the RMP.

☐ Yes	☐ No	Are contaminated areas completely delineated horizontally and vertically in soil?
☐ Yes	☐ No	Are contaminated areas completely delineated horizontally and vertically in groundwater?
☐ Yes	☐ No	Is source identified and completely delineated?
☐ Yes	☐ No	Is source migrating or has migrated off-site?
☐ Yes	☐ No	Is source left as is?
☐ Yes	☐ No	Is source partially removed and residual source being managed?
☐ Yes	☐ No	Is source controlled with physical or administrative methods?
☐ Yes	☐ No	Are all pathways of concern identified?
☐ Yes	☐ No	Have all relevant receptors been identified and protected?
☐ Yes	☐ No	Is there a monitoring program in place to verify RMP success?
☐ Yes	☐ No	Are there third parties related to this RMP? (*if the answer is 'no', skip the next question.*)
☐ Yes	☐ No	If there are third parties, have all of them accepted the RMP?
☐ Yes	☐ No	Is there a commitment from person(s) responsible to implement and monitor the RMP until final remediation guidelines are achieved?
☐ Yes	☐ No	Is there a contingency plan in place should the RMP fail?
☐ Yes	☐ No	Is the RMP implemented for the site?

Public Disclosure and Privacy Notification

The *Record of Site Condition* form is a public record that is disclosed in accordance with section 35 of the *Environmental Protection and Enhancement Act, Disclosure of Information Regulation*, and *Ministerial Order 23/2004*. Reasonable efforts have been made to minimize collection of personal information where possible. Personal information on the form is collected under the authority of section 12(c) and other provisions of the *Environmental Protection and Enhancement Act* and is in compliance with section 33(a) and 33(c) of the *Freedom of Information and Protection of Privacy Act* (FOIP). Personal information collected on this form will be used by Alberta Environment and Sustainable Resource Development (ESRD) or the Alberta Energy Regulator (AER), as the case may be, for the purposes of administering its programs.

Accuracy of Information

The information in this document has been submitted by persons other than ESRD or the AER. The Department, the Government of Alberta, and the AER cannot and do not warrant that the information in this document is current, accurate, complete, or free of errors. Persons accessing the information provided should not rely on it, and any reliance on the information provided is taken at the sole risk of the user. Users of this information are advised to conduct their own due diligence to satisfy themselves of the environmental condition of the property of interest.

8 DECLARATION

This *Record of Site Condition* form was prepared for the purpose of reporting on the state of environmental site conditions and, where applicable, for the purpose of remediation or reclamation, for:
Ryley Facility (site name) (the "Site").

I, as the licensed operator or authorized representative, have reviewed all information that was used in preparation of this form and I am satisfied that it was prepared in a manner consistent with the Applicable Standard[‡] together with any relevant additional guidance that is available from Alberta Environment and Sustainable Resource Development as of this date for conducting environmental site assessments.

Having conducted reasonable inquiries to obtain all relevant information, to my knowledge, the statements made in this form are true as of this date. I have disclosed all pertinent information of which I am aware concerning the historical and current environmental condition of the Site to the Director.

Any use which a third party, other than the Crown in right of Alberta or the AER, makes of this form, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. The undersigned accepts no responsibility for damages, if any, suffered by any third party, other than the Crown in right of Alberta and the AER, as a result of decisions made or actions based on this form. Any exclusions or disclaimers to the contrary contained in any attachment to this form are of no force or effect as against the Crown in right of Alberta and the AER.

Footnote ‡:

"Applicable Standard" means

a) for the purposes of upstream oil and gas sites,

i) *2010 Reclamation Criteria for Wellsites and Associated Facilities Application Guidelines* (ESRD 2011),

ii) CSA Standard Z769, *Phase II Environmental Site Assessment,* as amended, for any Phase II site assessment information used in preparation of this form on all upstream oil and gas sites not included in a) i);

b) for the purposes of all other sites, CSA Standard Z768, *Phase I Environmental Site Assessment,* as amended, for any Phase I site assessment information and with CSA Standard Z769, *Phase II Environmental Site Assessment,* as amended, for any Phase II site assessment information used in preparation of this form.

By signing below, I as the licensed operator or authorized representative, confirm the information provided herein is correct and complete, to the best of my knowledge and belief.

Clean Harbors Inc.	Aziz Shaikh	Senior Hydrogeological Engineer		10-11-2017
Name of operator	Name of authorized representative	Title of authorized representative (*e.g. officer, director*)	Signature	Date (*dd-mon-yyyy*)

APPENDIX H

TETRA TECH'S GENERAL CONDITIONS

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, is in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

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

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by persons other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document 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 conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 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 in its reasonably exercised discretion.